Advanced Intelligent Systems for Sustainable Development AI2SD'2018

PROCEEDING

AI2SD 2018 Conference 11,14 - July 2018 Tangier - MOROCCO

Editor
Pr. EZZIYYANI Mostafa

Advanced Intelligent Systems for Sustainable Development (AI2SD-18)

ID Conference Record #42255

ISBN: 978-9854-28-3

Conference venue: FST Tangier, Tangier-Morocco

General Editor

Prof. Mostafa EZZIYYANI

Springer

Foreword

It is with deep pleasure and satistfaction that I write this Foreword to the Proceedings of the of International Conference on Advanced Intelligent Systems for Sustainable Development (AI2SD-18) held in the wonderful Moroccan city of Tangier in July 11-14, 2018.

This year, AI2SD-18 projected into broader hot research topics that strives to stimulate study and research in favor of socio-economic sustainable development.

AI2SD-18 consists of technical, invited sessions, keynote and tutorial sessions covering the state-of-the-art and advanced research work on intelligent systems applied to Agriculture, Environment, Health and Energy along with themes related to Big Data, Networking, Computer vision, Natural Language Processing, and other scopes.

The papers contributed with the most recent scientific knowledge known in the aforementioned. The Technical Program committee (TPC) will include more than 220 of them in this volume proceedings, given their originality and relevance to the conference scopes. The TPC will also include 6-8 keynote speeches addressing hot topics related the conference themes.

The papers accepted and presented in AI2SD-18 will be published in proceedings as special issue of Springer proceedings Books within the Advances in Intelligent Systems and Computing Serie (into 4 volumes). Moreover, a number of selected high-impact full text papers will also be considered for the special journal issues as extended version.

All our thanks and greetings are addressed to the committee chairs for their great work, in either the organization or the review process.

Prof. Mostafa EZZIYYANI

General Chair

Mostafa EZZIYYANI
Faculty of Sciences and Technologies of Tangier, Professor
Computer Sciences Department
ezziyyani@gmail.com

Keynotes

Mr. IKKEN Badr, Director general, Institute of Research in Solar Energy and New Energies (IRESEN), Morocco

Prof. KHALIL Ismail, Syarif Hidayatullah State University of Jakarta, Indonesia, Morocco

Prof. Nasser Kettani, Managing Director, Kettani Digital Consulting, India

Prof. Bouchta El Moumni, Abdelmalek Essaâdi University, FPL, Morocco

Prof. Lloret Mauri Jaime, Research Institute, Polytechnic University of Valencia

Prof. Kacprzyk Janusz, Research Institute, Polish Academy of Sciences

TPC Chairs

Pascal LORENZ, France

Puerto Molina, Spain

Abdellah AZMANI, Morocco

Jaime Lloret Mauri, Spain

Joel Rodrigues, Portugal

Mohammed Bahaj, Morocco

Hajar Mousannif, Morocco

Abdel Ghani Laamyem, Morocco

Khalid Zine-Dine, Morocco

Ahmed Azouaoui, Morocco

Philippe Roose, Morocco

El Metoui Mustapha, Morocco

Jbilou Mohammed, Morocco

Mustapha Zbakh, Morocco

Organizing committee

Mounir Azmani
Mohammed Ezziyyani
Loubna Cherrat
Sanae Khali Issa
Wafae Baida
Mustapha Zbakh
Abdellah AZMANI
Ahmed Ziani
El Metoui Mustapha
Jbilou Mohammed
Brahim Hadj Baraka
Modfi El Amrani
Aknin Noura
Lazaar Saiida
Said Ouatik El Alaoui
Mohammed El M'rabet
Soumaya El Mamoune
Taha Ait Tchakoucht
Maroi Tsouli Fathi
Marwa Zaryouli
Intissar El Kaddaoui
Sara Khrouch
Yassine Fenni
Achraf Nhiri

Technical Program Committee

- Pedro Mauri, Spain
- Sandra Sendra, Spain
- Lorena Parra, Spain
- Oscar Romero, Spain
- Kayhan Ghafoor, China
- Jaime Lloret Mauri, Spain
- Yue Gao, UK
- Faiez gargouri, Tunis
- Mohamed Turki., Tunis
- Abdelkader Adla, Algeria

- Souad Taleb Zouggar, Algeria

- Bakhta Nachet, Algeria

- Danda B. Rawat, USA

- Tayeb Lemlouma, France

- Mohcine Bennani Mechita, Morocco

- Tayeb Sadiki, Morocco

- Mhamed EL Merzguioui, Morocco

- Abdelwahed Al Hassan, Morocco

- Mohammed BOULMALF, Morocco

- Abdellah AZMANI, Morocco

- Kamal Labbassi, Morocco

- Jamal EL Kafi, Morocco

- El Hassan Abdelwahed, Morocco

- Mohamed Chabbi, Morocco

- Mohamed_Riduan ABID, Morocco

- Jbilou Mohammed, Morocco

- Salima Bourougaa-Tria, Algeria-

- Mohammed Bahaj, Morocco

- Feddoul Khoukhi, Morocco

- Ahlem Hamdache, Morocco

- Mohammed Reda Britel, Morocco

- Youness Tabii, Morocco

- Mohamed El Brak, Morocco

- Hamid Harroud, Morocco

- Joel Rodrigues, Portugal

- Ridda Laaouar, Algeria

- Mustapha EL JARROUDI, Morocco

- Abdelouahid Lyhyaoui, Morocco

- Ziani Ahmed, Morocco

- Karim El Aarim, Morocco

- Mustapha Maatouk, Morocco

- Abdel Ghani Laamyem, Morocco

- Mounia Ajdour, Morocco

- Abdessamad Bernoussi, Morocco

- Loubna Cherrat, Morocco

- Ahlem Hamdache, Morocco

- Mohammed Haqiq, Morocco

- Abdeljabbar Cherkaoui, Morocco

- Rafik Bouaziz, Tunis

- Hanae El Kalkha, Morocco

- Othma Chakkor, Morocco

- Abdelali Astito, Morocco

- Rachid OULAD HAJ THAMI, Morocco

- Mounia Ajdour, Morocco

- Kazar okba, Algeria
- Omar Akourri, Morocco
- Pascal LORENZ, France
- Puerto Molina, Spain
- Herminia Maria, Spain
- Driss Sarsri, Morocco
- Muhannad Quwaider, India
- Mohamed El harzli, Morocco
- Wafae Baida, Morocco
- Mohammed Ezziyyani, Morocco
- Xindong Wu, China
- Sanae KHALI ISSA, Morocco
- Monir Azmani, Morocco
- El Metoui Mustapha, Morocco
- Mustapha Zbakh, Morocco
- Hajar Mousannif, Morocco
- Mohammad Essaaidi, Morocco
- Amal Maurady, Morocco
- Ouardouz mustapha, Morocco
- Mustapha El Metoui Morocco
- Said Ouatik El Alaoui, Morocco
- Nfaoui El habib, Morocco
- Aouni Abdessamad, Morocco
- Noureddine EN-NAHNAHI, Morocco
- Ahachad Mohammed, Morocco
- Abdessadek Aaroud, Morocco
- Mohammed Said Riffi, Morocco
- Abderrahim Abenihssane, Morocco
- Abdelmajid El Moutaouakkil, Morocco
- Silkan, Morocco
- Salwa Belaqziz, Morocco
- Khalid Zine-Dine, Morocco
- Ahlame Begdouri, Morocco
- Mohamed Ouzzif, Morocco
- Mahmoud Nassar, Morocco
- Khalid Amechnoue, Morocco
- Hassan samadi, Morocco
- Mohammed YAHYAOUI, Morocco
- Hassan Badir, Morocco
- Ezzine abdelhak, Morocco
- Mohammed Ghailan, Morocco
- Mohammed Ahmed Moammed Ail, Sudan
- Mohammed El M'rabet, Morocco
- EL Khatir Haimoudi, Morocco

- Aknin Noura, Morocco

- Lazaar Saiida, Morocco

- Mehdaoui mustapha, Morocco

- Zoubir El Felsoufi, Morocco

- Yousef Farhaoui, Morocco

Table of Contents

TOPIC A:

Advanced Intelligent Systems for Sustainable Development Applied to Agriculture

TOPIC B :

Advanced Intelligent Systems for Sustainable Development Applied to Energy

TOPIC C:

Advanced Intelligent Systems for Sustainable Development Applied to Health

TOPIC D:

Advanced Intelligent Systems for Sustainable Development Applied to Environment

TOPIC E:

Big Data Analytics, Business Intelligence, and Natural Language Processing

TOPIC F:

Cloud, Networking and Network applications

TOPIC G:

Image processing, Computer Vision and intelligent systems

TOPIC H:

Information Security and Optimization algorithms

TOPIC I:

Web Services, Ontologies and E-Learning

TOPIC J:

Mathematics, Materials, and Signal Processing

POSTER SESSION:

SPECIAL SESSION:

Weather Data For The Prevention Of Agricultural Production With Convolutional Neural Networks

Hajji Tarik, Ouazzani Mohemmad Jamil
Laboratory of Systems and Sustainable Environment
Faculty of Engineer Sciences, Private University of Fez, Morocco
hajji@upf.ac.ma, ouazzani@upf.ac.ma

Abstract— We present in this document, an approach that uses artificial intelligence in the service of agriculture. We use convolutional neural networks to prevent the amount of agricultural production per hectare. First, we started with the massive collection of weather and meteorological data from the study area during the last 57 years. Secondly, we have moved to the data processing phase: normalization, filtering and segmentation of data. Thirdly, we design the learning and testing database, then we looked for the most efficient neural architecture in terms of learning time and recognition rate. Finally, we tested the proposed neural model and presented our results and perspectives.

Index Terms — Convolutional Neural Networks, Agricultural, production, Data analysis, Weather Data

Experimental study of the impact of drying parameters on Dandelion root by a solar dryer

Haytem Moussaoui[1]*, Hamza Lamsyehe[1], Ali Idlimam[1], Abdelkader Lamharrar[1] and Mounir Kouhila[1]

[1] Team of Solar Energy and Medicinal Plants (EESPAM)
Teacher's Training College, Cadi Ayyad University
BP 2400 Marrakesh, Morocco
* haytem.moussaoui@gmail.com

Abstract— the proliferation of microorganisms, as well as the development of various chemical reactions, are the main causes behind the deterioration of the product. Both are caused by the quantity of water held within food. The following study aims at modeling the drying process and optimizing its conditions of use, as well as analyzing the interaction between the factors based on experiments, statistical calculations, and analysis. The drying kinetics of Dandelion root were carried out in an indirect active solar dryer with a separate solar collector and a drying unit. Drying is a process engineering operation that involves the removal of free water and some of the bound water without affecting the chemical structure in such a way as to lighten the weight and minimize the risks of many unwanted chemical transformations. To perform this procedure, the Team of Solar Energy and Aromatic and Medicinal Plants uses a technique based on solar energy, called solar drying forced convection, which requires sufficient sunlight to give a radiant energy to insulator in order to heat the air sucked by the fan. The modeling of the solar dryer is done in several methods, the plans of experiments, is one of these methods, based on statistical and experimental studies. This work is devoted to optimization of solar dryer setting parameters for medicinal and aromatic plants (MAP). The outcome is a model that helps to analyze the impact of the drying parameters on the response, which is the time of drying.

Index Terms — Solar energy, drying parameters, semi-empirical models, Dandelion root, full factorial design

Valorization of natural solid materials and raw industrial waste in the adsorption of heavy metals from wastewater of the wastewater pretreatment plant in El jadida city to be reused for Irrigation

Rhouch Imane, Laamyem Abdelghani
Physics of Condensed Matter Laboratory, Department of Physics, Faculty of Sciences
Chouaib Doukkali University, El Jadida - Morocco
imane.rhouch@hotmail.com , Laamyem@hotmail.com

Abstract—Activated carbon as an adsorbent has been widely used to remove toxicity from wastewater, but its high cost causes restrictions in its use. For this reason, this study investigates at lab-scale the raw coal waste, namely Fly ash and bottom ash, by being a potential source of the pollution to be recycled as adsorbents. Besides coal waste, the adsorption test reclaims Clay soil and sea sand compound in different layers as Matrix to consequently perceive the performance of those adsorbent materials for heavy metals removal. The results show that an efficient simultaneous decrease of heavy metals has taken place due to the properties of the adsorbents that interacts with wastewater molecules to enhance its quality, the highest removal efficiency of heavy metals arrived at 83% for cadmium in the matrix compound of Fly ash, bottom ash and Clay, the novelty of this research lies on applying raw materials with no recourse to chemical or biological treatment to the adsorbent materials. The main objective is to reclaim a low cost-efficient adsorption process based on raw materials to be applied in a wastewater pretreatment plant where wastewater samples were picked out.

Index Terms — Adsorption, heavy metals, coal waste, Clay, Sand

Effect of climate change on growth, development and pathogenicity of phytopathogenic telluric fungi

EZZIYYANI Mohammed[1], HAMDACHE Ahlem[2] , ASRAOUI Meryem[3], REQUENA Maria Emilia[4], EGEA-GILABERT Catalina[5], CANDELA CASTILLO Maria Emilia[4]

[1] Polydisciplinary Faculty of Larache, Abdelmalek Essaâdi Univ. Larache, Morocco

[2] Faculty of sciences of Tetouan, Univ. of Abdelmalek Essaâdi Tetouan, Morocco

[3] Faculty of Sciences and Techniques, University of Hassan I, Settat, Morocco

[4] Faculty of Biology, Univ. of Murcia, Campus de Espinardo, Murcia, Spain

[5] Ingeniería Agronómica, University Politecnic of Cartagena. Cartagena, Spain .

E-mails : mohammed.ezziyyani@gmail.com , hamdach_ahlam@yahoo.fr , meryasra@gmail.com , mariemi@um.es , catalina.egea@upct.es , mcandela@um.es

Abstract— The month of April 2017 was the second warmest since records began in 1880, according to NASA. The first third 2017 is + 0.99 °C, one year after El Niño. Soil microorganisms are extremely numerous and diverse. This diversity responds to the multitude of biogeochemical microenvironments of the soil as well as to the complexity of the forms of organic matter in the soil, their energy resource. Their distribution in the soil is very heterogeneous and is explained by the presence of conditions supporting the development of life. A very likely consequence of global warming would be a change in the range of some phytopathogens such as Phytophthora capsici, Rhizoctonia solani and Fusarium oxysporum. The fungi live in relatively homogeneous conditions. They are all heterotrophic microorganisms living under aerobic conditions. Instead, they depend on the overall characteristics of the soil rather than on the microenvironments created in the heart of the soil structure. They can transport large amounts of elements (nitrogen, potassium, calcium, magnesium) and water through the mycelial network. Indeed, certain microorganisms are known to have a distribution limited by temperature. To do this, we focused on the mean rate of mycelial growth as a function of the time (Vmax=d/t) of the phytopathogenic agents P. capsici, R. solani and F. oxysporum, at three different temperatures (20, 25 and 30 °C) and we also used a series of agroclimatic indices. The results show that F. oxysporum and R. solani have a very limited distribution at 22 and 30 °C (Vmax≈ 10 mm) for 72h; however, P. capsici showed a Vmax≈ 20 mm for 72h, although the pathogen also depends on the temperature, probably its reproductive success as well as its distribution and speeds of development are extremely related to moisture. The pathogenicity analyzed by artificial inoculation of pepper seedlings shows that P. capsici is very aggressive at 30 °C, F. oxysporum showed virulence only at 25 °C but R. solani lost all virulence between 22 and 30 °C.

Index Terms —Climate Change, Temperature, Phytopathogenic telluric

An intelligent approach for enhancing the agricultural production in arid areas using IoT technology

Abdelhak Merizig, Meftah Zouai, Hamza Saouli, Okba Kazar
LINFI Laboratory, Computer Science Department,
University of Biskra, Biskra, Algeria
merizig.abdelhak@gmail.com , zouaimeftah@yahoo.fr ,
hamza_saouli@yahoo.fr, kazarokba@gmail.com

Abstract— The increasing of dates fruit development in Algeria becomes important for the next generations because it can enhance the national economy. To improve the production of this treasure more than more, we need to analyze and to monitor the previous production for giving the consequences that can make the best results. Since we have many farms with a large number of palms tree it is a difficult task to supervise and collect data in short time. For this major problem, we need to integrate a set of components that can communicate together to support the farmers in collecting data. Therefore, the solution to this issue is to propose an intelligent architecture that uses a method that can help the expert to make decisions. In this work, we present a solution to forecast the dates fruit production based on historical data, in order to enhance the quality and the performance of the production in coming years. Moreover, to collect data in this work we use an intelligent technology with a drone to facilitate the collection operation. The implementation of this model has been provided in order to evaluate our system. The obtained results demonstrate the effectiveness of our proposed system.

Index Terms — Agricultural Science, Dates Fruit Production, IoT Agriculture, NFC, Support Vector Regression, Decision Support System

Impacts of climate change on the production, yield and cost of adaptation of varieties imported from strawberry plants in the perimeter of Loukkos (Morocco)

EZZIYYANI Mohammed[1], HAMDACHE Ahlem[2], EZZIYYANI Mostafa[3] , CHERRAT Loubna[4]

[1] Polydisciplinary Faculty of Larache, Abdelmalek Essaâdi Univ. Larache, Morocco

[2] Faculty of sciences of Tetouan, Univ. of Abdelmalek Essaâdi Tetouan, Morocco

[3] Faculty of Sciences and Techniques, Abdelmalek Essaâdi Univ., Tangier, Morocco

[4] Faculty of Sciences El Jadida, Univ. of Chouaib Doukkalli, El Jadida, Morocco,

mohammed.ezziyyani@gmail.com , hamdach_ahlem@yahoo.fr, m.ezziyyani@fstt.ac.ma , l.cherrat@ucd.ac.ma

Abstract— On a technical level, the cultivation of strawberry in Morocco, has developed remarkably during the last 20 years. During the 2016-2017 crop year, this crop covers 3.050 hectares of land, including 180.378.742 strawberry plants imported from various varieties: Sabrina, San Andreas, Fortuna, Festival, Camarosa, Splendor and others. The period from 1990 to 2010, the dominant varieties that were grown are Chandler, OsoGrande and especially Camarosa and this thanks to its very high productivity, profitability, precocity, quality and adaptation to agroclimatic conditions of the perimeter of Luokkos. Moreover, from 2010, the Californian variety Camarosa (and others) experienced a dramatic decline!. The 2009 fall season is considered the hottest, and 2009 is the second warmest of the decade after 2005. From September to November 2009, maximum temperatures were very high during the day, and very low temperatures at night; hence the thermal gap and therefore new unusual meteorological weather events. Farmers had lost patience because of low yields (very low productivity <500g / plant) and doubts were starting about the choice (s) of the variety (s) !. A decline of the varieties Camarosa, Festival, Splendor and a total disappearance of varieties Amiga and Benicia. This upset the choice of the distribution of varieties of strawberry plants imported in 2017. Today, many varieties are disappearing Moroccan producers, the choice being dictated by the production objectives. It must be emphasized that the development of a new variety of native strawberries is more important than ever; knowing that it is a work of long halène. In fact, the expectations of strawberry producers for varietal innovation are rather diffuse and complex. It is thus the choice of a variety adapted to the edapho-climatic conditions of the Loukkous perimeter and the quality of the starting plant constitute the first step towards a good production and yield of strawberry. Morocco is already feeling the brunt of climate change after the severe drought of 2015 that decimated crops and depressed the economy. Morocco has adopted the "Green Morocco Plan" to face the threat of climate change, and aims to make agriculture one of the engines of growth of the national economy.

Index Terms — Climate change, Strawberry, Interannual variability, Loukkous

Bacillus amyloliquefaciens enhanced strawberry plants defense responses, upon challenge with Botrytis cinerea

ASRAOUI Meryem[1], ZANELLA Filippo[2], HAMDACHE Ahlem[3], SQUARTINI Andrea[4], MARCATO Stefania[2], AMZIL Jamila[1] , BALDAN Barbara[2] , EZZIYYANI Mohammed[5]

[1] Faculty of Sciences and Techniques, University of Hassan I, Settat, Morocco

[2] Department of Biology, University of Padua, Padova, Italy

[3] Faculty of sciences of Tetouan, Univ. of Abdelmalek Essaâdi Tetouan, Morocco

[4] Department of Agronomy Food Natural Resources Animals, Legnaro (PD), Italy

[5] Polydisciplinary Faculty of Larache, Abdelmalek Essaâdi Univ. Larache, Morocco

meryasra@gmail , filippo.zanella.2@studenti.unipd.it , hamdach_ahlem@yahoo.fr , squart@unipd.it , stefania.marcato@unipd.it , jamila_amzil@yahoo.fr , barbara.baldan@unipd.it , mohammed.ezziyyani@gmail.com

Abstract— Plants activate a range of active defense strategies in response to biotic stresses. Systemic acquired resistance (SAR) occurs when the plants are triggered by a stimulus prior to infection by a plant pathogen able to reduce the severity of the disease. The most widely studied group of PGPB is plant growth-promoting rhizobacteria that colonize the root surface. This trait plays a crucial role in protecting plants from pathogen attack since poor colonization could cause decreased antagonistic activity. The present work aims to isolate, identify and select strains from the rhizosphere of strawberry in the Larache area, with potential application as a biocontrol agent against gray mold disease caused by Botrytis cinerea. First, the selected bacteria and the pathogen were characterized using 16S rDNA and ITS sequencing respectively, and then challenged in dual culture as antagonists to evaluate their effect on the growth of B. cinerea. A set of experiments was performed to check their abilities to colonize the roots of strawberry plants in the soil using scanning electron microscopy. In addition, the expression of defense genes such as chitinase and glucanase induced in systemic acquired resistance as pathogenesis-related protein have been investigated through plants with roots that were colonized by one of these strains. Among the selected bacteria that inhibited the growth of B. cinerea in vitro, Bacillus amyloliquefaciens was able to associate to the external roots by forming biofilm and it was observed that upon challenge with B. cinerea, inoculation of Fragaria x ananassa plants with B.amyloliquefaciens, SAR-induced plants showed an augmented expression of PR1 and β-1,3-glucanase (FaBG2-2) genes to higher levels than non-induced plant. This "priming" effect indicated that induced plants activate defense-related gene expression earlier and stronger than non-induced plants.

Index Terms —Fragaria x ananassa, Botrytis cinerea, Bacillus amyloliquefaciens, Biological control, Defense-related gene

An alternative control of yellow rust on bread wheat with essential oils of Mentha pulegium, Eugenia aromatica, and Cedrus atlantica

Marie Solange Uwineza[1], Brahim El Yousfi[2] and Abdeslam Lamiri[3]
[1] Faculty of Sciences and Techniques, University of Hassan I, Settat, Morocco
[2] National Institute for Agronomic Research (INRA-CRRA), Settat, Morocco
[3] Superior School of Technology, University of Hassan I, Berrechid,, Morocco
marie.sol012@gmail.com , elyousfi_brahim@yahoo.com ,
lamiri_abdeslam@yahoo.fr

Abstract— Synthetic fungicides have an important role in agriculture development and evolution. However, in intensive agriculture, their misuse threatens directly natural ecosystem stability, and this stability should be protected by relying on other alternatives such as the use of biofungicides. In this regard, the objective of this work was to test three essential oils for the control of yellow rust (Puccinia striiformis) of wheats. The experiment used a susceptible variety in a randomized complete block design with four blocks, and four treatments consisted of three essential oils; clove (Eugenia aromatica), pennyroyal (Mentha pulegium) and Atlas cedar (Cedrus atlantica) along with a chemical treatment (Spiroxamine, Tebuconazole and Triadimenol), applied at a dose of 0.8 l/ha for a slurry of 200 l/ha. The experiment was repeated twice in space under field conditions. The essential oils (1.25 ml/l) as well as the fungicide were applied at the heading stage with a backpack sprayer having a ramp of two meters with four nozzles spaced 0.5 m. The effectiveness of these treatments was evaluated as grain yield increase and thousand-kernel weight (TKW) in comparison to the untreated check. Only pennyroyal essential oil increased grain yield by 23% without affecting TKW, while the fungicide decreased grain yield by 24% by affecting TKW. These results are relative to the concentrations used and to the number of applications, and they prove that pennyroyal essential oil could be an alternative control measure to yellow rust on bread wheat. Implications of these results were discussed in the document.

Index Terms — Yellow rust, Puccinia striiformis, bread wheat, essential oils, Mentha pulegium.

Study of Growth and production of Botrytis cinerea conidia of Some Morrocan isolates in different nutrients media

HAMDACHE Ahlem[1], LAMARTI Ahmed[1], EZZIYYANI Mohammed[2]
[1] Faculty of sciences of Tetouan, Univ. of Abdelmalek Essaâdi Tetouan, Morocco
[2] Polydisciplinary Faculty of Larache, Abdelmalek Essaâdi Univ. Larache, Morocco
hamdach_ahlem@yahoo.fr , mohammed.ezziyyani@gmail.com

Abstract— Botrytis species include some serious fungal plant pathogens, which are implicated in many diseases affecting flowers, fruits, cereals, legumes, and other vegetables. In particular, Botrytis cinerea attacks economically important crops such as carrots, grapes, lettuce, strawberries, and tobacco, producing various leaf spot diseases and grey mould. In this work, we have studied, in vitro, the growth and the sporulation of some isolates of Botrytis cinerea in different nutrient media. Our aim was to select the isolate the most pathogen to use it in biological control tests. For this purpose, ten isolates of Botrytis cinerea were isolated, purified and identified in the laboratory. Seven isolates were isolated from samples of strawberry fruit harvested from fields; four of them, are originated from strawberry fields of Zlaoula and Laâwamra (Larache) and three are originated from fields of Moulay Bouselham (Algharb). Others are isolated from postharvest strawberry. The growth and sporulation of all of the isolates are studied and compared in different nutrient media PDA, MEA, Czapek and organic medium of strawberry. Among all of the isolates tested, Botrytis cinerea Bt7 originated from fields of Zlaoula was the most important isolate with maximum growth in all of nutrients media, and maximum sporulation (74,7.105 sp/ml). B. cinerea was inoculated artificially in leaf and fruit stawberry and it causes the visible disease symptoms of grey mould.

Index Terms — Botrytis cinerea, nutrient media, mycelial growth, sporulation, pathogenicity

Data mining for predicting the quality of crops yiels based on climate data analytics

Maroi TSOULI FATHI, Mostafa EZZIYYANI, Soumaya EL MAMOUNE
Faculty of Science and Technology/ Computer Science, Tangier, Morocco
maroi.tsouli @gmail.com , ezziyyani@gmail.com , soumayamgi@gmail.com

Abstract— This study assesses the impact of climate change on farmers' farm incomes in Morocco, using the data mining approach. Several eco-nonmetric models have been tested based on primary data. These models made it possible to establish part of the relationship between agri-cultural income and climatic variables (temperature and precipitation) and, on the other hand, to analyze the sensitivity of agricultural incomes to these climatic variables .The field of agriculture is extremely sensitive to the change of the climate, the variations intra and inter-seasonal cause the increase in the temperatures and the variations on the modes of precipitation which decreases the seasonal crop yields and increases the probability of bad short-term harvests and a reduction of the long-term production. However, this relation between climate change and agriculture are not yet foreseeable for the future, it will be thus interesting to make a predictive study which will allow the climatic analysis of data followed by an Agro-climatic study of data to establish the connection between climate change and agricultural production and suggested afterward plans of adaptation to this change. In this study, we will carry out a comparative study, between the various methodology and tools of analysis of data of data mining to choose the algorithms that will adapt the best for our predictive analysis which will allow us to determine the threat of the impact of the climate change on the production of certain agricultural crops in morocco

Index Terms — Morocco, Agriculture, climate change, data mining Algorithm, data analysis

Déterminants de l'adoption de l'assurance agricole : cas des agriculteurs de quelques communes dans la province de Benslimane du Maroc

E. Ezzahid[1], A. Bousselhami[1], A. Zoglat[1] et O. Taleb[2] Moulay
[1]University Mohammed V- Rabat-Morocco
[2]University Abdelmalek Essaadi, Tanger-Morocco

Abstract— Le but de cette étude est d'identifier les facteurs qui influent sur l'adoption de l'assurance agricole dans la province de Benslimane (Maroc) en choisissant 6 des 12 communes rurales constituant la province pour mener une enquête de terrain pour la collecte des informations prévues dans le questionnaire. L'échantillon comprend 177 agriculteurs. Les données sur seulement 150 agriculteurs sont retenus et introduits dans l'analyse économétrique par le modèle de Tobit. Les facteurs étudiés sont l'âge, le niveau d'éducation, l'expérience de l'agriculteur, le nombre de personnes vivant avec l'exploitant dans son ménage, le nombre de ceux qui l'aident dans son travail, le type de propriété, la surface agricole utile, l'accès à des informations adéquates sur l'assurance agricole et les visites effectuées par les agents d'extension. Les facteurs qui ont été identifiés comme étant statistiquement significatifs par le modèle de Tobit sont l'âge, le niveau d'éducation, l'expérience agricole, l'accès à une information adéquate et le nombre de visite des agents d'extension.

Index Terms — Assurance agricole, Adoption, modèle Tobit, point de censure

The effect of inoculation by indigenous endomycorrhizal fungi on the tolerance of Tetraclinis articulata Vahl masters plants to water stress

Amal EL KHADDARI[1], Jamila DAHMANI[1], Jalila AOUJDAD[1], Younes ABBAS[2], Abdenbi ZINE EL ABIDINE[3], Mohamed OUAJDI[1], Salwa EL ANTRY[1]
[1] Center of Forest Research, Rabat-Agdal, Morocco
[2] Polydisciplinary Faculty, Sultan Moulay Slimane University, Beni-Mellal, Morocco
[3] National School Forestry of Engineers, Sale, Morocco
elkhaddaribiologiste@gmail.com , jdahmani1@gmail.com , jalilaaoujdad@gmail.com , a.younes@usms.ma , zineenfi@gmail.com , ouajdim@gmail.com , elantry.salwa@gmail.com

Abstract— In this study, we examined several aspects related to water stress tolerance of Thuya (Tetrclinis articulata Vahl masters) inoculated with an native Arbuscular Mycorrhizal Fungi (AMF). The mycorrhizal and non-mycorrhizal Thuya were subjected to two water levels: under well-watered and under water stress Our results show that the AMF have a significative impact on biomass growth. The leaf water potential was also higher in stressed (less negative) mycorrhizal plants (-18 bar), than in non- mycorrhizal plants (-41 bar), these mycorrhizal fungi have also maintained, a water content, they have higher values compared to the control after 19 days of stress. These results confirm that inoculation with AMF can improve plant drought tolerance by increasing leaf water potential in mycorrhizal plants during drought and provide a potential solution for the conservation and recovery of T. articulata in plants on natural ecosystems.

Index Terms —water stress, arbuscular mycorrhizal fungi, water stress tolerance, Tetraclinis articulata Vahl masters, Morocco

AgriFuture: A New Theory of Change Approach to Building Climate-resilient Agriculture

Hajar Mousannif, Jihad Zahir
LISI Lab., Faculty of Sciences Semlalia, Cadi Ayyad Univ., Marrakech, Morocco
mousannif@uca.ac.ma , j.zahir@uca.ac.ma

Abstract— Agriculture in Morocco, like in many developing countries, remains very sensitive to climatic fluctuations, with drought occurring recurrently; creating volatility in agricultural production and impacting negatively the lives of farmers. How to quantify the impact of climate change on the quality of life of farmers? How can climate-resilience be strengthened and livelihoods of farmers enhanced? How to make the adoption of improved agricultural technologies and practices by farmers sustainable? This paper aims at answering all those questions by presenting a new Theory of Change approach targeting the construction of comprehensive and large-scale datasets which integrate data from a wide range of stakeholders. Advanced data analytics will be applied on those data to provide a thorough understanding of the interrelated climatic, environmental, social, cultural, economic, institutional and political factors that aggravate differentiated climate change impacts. This will allow discovering hidden patterns in the data, making decisions and establishing recommendation systems guiding stakeholders' choices in terms of policies, irrigation decisions, types of crops to plant, and actions to take to enhance crop yield production, in order to make the most vulnerable communities more resilient to climate change.

Index Terms —Agriculture, Theory of Change, Big data analytics, Machine Learning, climate change

A Method for segmentation of agricultural fields on aerial images with Markov random field Model

Jamal Bouchti[1], Adel Asselman[1] and Abdellah El Hajjaji[2]
[1] Optique and Photonic Team, Faculty of Sciences,M'hannech II, Tetuan, Morocco
[2] Systems of communications and Detection Laboratory, Faculty of Sciences,M'hannech II, Tetuan, Morocco
jamalbouchti@gmail.com , adelasselman@gmail.com, abelhajjaji@yahoo.fr

Abstract— Aerial imaging has become very important to areas like remote sensing, surveying, and Specifically in the agricultural application areas. In this paper, we propose an aerial image segmentation method based on Markov random field model and Gibbs distributions, we introduce iterative algorithm process to minimize an energy function which incorporate a local characteristics of pixel like color and also Neighborhood characteristics like texture and CIEDE2000.

Index Terms — Aerial Image segmentation, Markov random field, Potential energy function, iterative algorithm, CIEDE2000

Fuzzy TOPSIS with coherent measure

Mohamed EL ALAOUI[1], Hussain BEN-AZZA[1]and Khalid EL YASSINI[2]
[1] ENSAM-Meknes, Moulay Ismail University Meknes, Morocco
[2] Science Faculty, Moulay Ismail University, Meknes, Morocco
mohamedelalaoui208@gmail.com, hbenazza@yahoo.com ,
khalid.elyassini@gmail.com

Abstract— Fuzzy logic has been widely used combined with Multi Criteria Decision Making techniques in different application. Here we propose to aggregate fuzzy opinions with a mathematical model, in order to minimize discordances. An illustrative example treating closed loop agriculture Supply Chain is given.

Index Terms — fuzzy TOPSIS, optimal weight, coherence measure, performance analysis, agriculture.

Smart management system to monitor the negative impact of chemical substances and the climate change on the environment and the quality of agricultural production

Cherrat Loubna[1] and Mostafa Ezziyyani[2]
FS of El Jadida, Chouab Doukkali Univ., Morocco
[2]Abdelmalek Essâdi Univ., Faculty of Sciences and Techniques of Tangier, Morocco
Cherratloubna2@gmail.com, ezziyyani@gmail.com

Abstract— This paper has a dual purpose, on the first hand, it focuses on the study of substances and agricultural submissions lead to environmental pollution and have a negative impact on agricultural production. Therefore, our goal is to launch research to properly define a list of pollutants before launching a harmonized measurement test. Our research, team is working on the evolution of practices at the farm level to integrate the different environmental concerns: water quality and air quality. On the other hand, this paper aims to show the impact of climate change on the agriculture sector and on agricultural production based on the data analysis of all the parameters that cause climate change in coordination with the necessary farming conditions. This will allow us to develop a Climate Change Prediction System (CCPS) with four purposes: (1) for determining the decision model parameters of the used substances and agricultural production; (2) for predicting of periods of the drought, the frost and the flood; (3) for determining the risk of the impact of these climate changes on quality agricultural production; (4) for developing and proposing adaptation solutions of agricultural crop suitable to seasonal climate change. Our final ambition is the realization of a thorough and experimental field research by specialists and experts of the field (Applied on the two different regions, Larache Morocco and Granada Spain) and is set up a system of comprehensive decision support based on new Internet of Things and Wireless Sensor Network technologies to help the managers and the farmers to protect the environment and produce and adapt crops to changing climatic conditions. The system will increment the knowledge database that will be used in create decision support systems. This system can be used as a reference to develop smart monitoring systems to be applied in some more application fields.

Index Terms — Big Data, Data Analytics, Data-mining, Environment, Agriculture, Air, Water, Pollution

Predictions & Modeling Energy Consumption for IT Data Center Infrastructure

Merzoug soltane[1], Philippe roose[2], Kazar okba[3] and Derdour Makhlouf [4]
[1] Department of computer sciences, El-oued Univ., El-oued, Algeria
[2] LIUPPA, University of Pau et Pays de l'Adour, Anglet, France
[3] Department of computer sciences, Biskra Univ. , Biskra, Algeria
[4] Department of computer sciences, Tebessa Univ. , Tebessa, Algeria
merzoug-soltane@univ-eloued.dz, Philippe.roose@univ-pau.fr,
kazarokba@gmail.com, m.derdour@yahoo.fr

Abstract— Recent statistics of energy consumption by Cloud datacenter show the DCs consumes more and more energy each year. that crated big challenge in Cloud research. IT industry is keenly aware of the need for Green Cloud solutions that save energy consumption in Cloud DCs. A great deal of attention has been paid to minimize energy consumption in cloud datacenter. However, to understand the relationships between running tasks and energy consumed by hardware we need to propose mathematical models of energy consumption. The models of energy consumption can be help as to saving energy. Both researchers aim to proposed mechanism for energy consumption. In this paper, we analyzed the relationships between Cloud system manager and energy consumption. This paper aims at proposing and designing energy consumption models with mechanism of prediction energy.

Index Terms — energy consumption, energy modeling, energy predictions, datacenter energy consumption

Study of desorption isotherms of sardine fillets: Characterization and Modeling

H. Lamsyehe[1], H. Moussaoui[1], M. Kouhila[1], A. Idlimam[1], A. Lamharrar[1] and H. Mouhani[2 1] Team of Solar Energy and Aromatic and the Medicinal Plants of High Teacher Training School Cadi Ayyad University, Marrakech, Morocco
[2] Electrochemistry laboratory for catalysis and environment, Ibn Zohr. University Agadir, Morocco
Lamsyehe@gmail.com

Abstract—The physical, chemical and microbiological stability of a dried food product is influenced by its water activity (aw). The stability is mainly a consequence of the equilibrium moisture content relationship with its corresponding aw. The moisture desorption isotherms of sardine fillets were determined at three temperatures (30, 40 and 50 °C) in using the static gravimetric method. The desorption isotherms of sardine fillets have been described using empirical models available in the literature (GAB, BET modified, Enderby, Oswin modified, Peleg, LESPAM & Smith), have been compared to describe desorption isotherms. The GABand Peleg models showed the best agreement with experimental data. The criteria for choosing the model are based on the following statistical parameters: the correlation coefficient R2, the average systematic error S and MRE%.

Index Terms —water activity, desorption isotherms, modeling, sardina pilchardus

Modelling wind speed using mixture distributions in Tangier region

F. BAHRAOUI[1], H. SEFIAN[1], Z. BAHRAOUI[2]
[1] Laboratory of heat transfer and Energetic, Faculty of Sciences and Techniques, Tangier, MOROCCO
[2] Depart. of Econometrics, Riskcenter-IREA, Univ. of Barcelona, Barcelona, Spain
fbahraoui@gmail.com , hind.sefian@outlook.fr , bahraouizuhair@gmail.com

Abstract— The main objective of this paper is to improve the predictability of wind generation, considering an adaptative probabilistic model to wind speed for Tangier site in north Morroco. In this perspective, we will compare the adjustment of wind speed distribution by Weibull distribution and two mixture distribution function as a solid alternative model to the eolian energy models. First with the mixture of the Weibull and Pareto distribution, and second with Lognormal and Pareto distribution. Our aim is to capture the outliers if there exists in the data and gives a most precise estimation of the power density energy. To highlight the utility of the selected model, a comparative simulation of wind energy produced are also presented.

Index Terms —Wind speed, Wind power density, wind variation, Statistical analysis, Weibull, Lognormal, Pareto, probability density function

Applied study of energy saving, voltage drop reducing technically using reactive power compensation and cable resizing in Gaza electrical grid and its program simulation quality improvement

Hussam Awwad
Palestinian Broadcasting Corporation Gaza, Palestine
husam20111@gmail.com

Abstract— This paper introduces suggestion to reduce the losses and voltage drop by reactive power compensation and cable sizing. This losses reduction ratio, the annual saving and reducing in voltage drop is a good motivation to rehabilitate the Gaza Governorate Electrical Grid by applying this suggestion. The grid was unbalanced in most cases, there was a big difference in losses and voltage drop between balance and unbalanced load in the two feeders have been taken as a case study.

Index Terms —Cable Sizing, capacitor bank, Distribution Grid, reactive power compensation

Analytical modelling and analysis of thermal behaviour for series resistance of solar cell

Mohamed Louzazni[1], Ahmed Khouya[2], Khalid Amechnoue[1], Marco Mussetta[3] and Rachid Herbazi[1]
[1] Mathematics, Informatic & Applications Team, National School of Applied Sciences, Abdelmalek Essaadi Univ., Tanger, Morocco
[2] Laboratory of Innovative Technologies, National School of Applied Sciences, Abdelmalek Essaadi University, Tangier, Morocco
[3] Department of Energy, Politecnico di Milano, 20156 Milano, Italy
louzazni@msn.com, ahmedkouya3@yahoo.fr, kamechnoue@gmail.com, marco.mussetta@polimi.it, rachidherbazi@gmail.com

Abstract— In this paper, the analysis of the nonlinear and complex modeling of a solar cell is addressed, to study its thermal behavior. From literature it is well known that the output power of a solar cell monotonically decreases with the temperature; here, we investigate the specific expression based on derivation of current and power to simplify the equation model. Thus, applying the specific expression of the series resistance, we analyze the relation characteristics between the power and the temperature. Moreover, we aim to present a method to determine the specific theoretical expression of the series resistance with combination of parallel parasitic resistances. The analytical model equation is tested and compared with experimental results to add validity to the model.

Index Terms —power equation, solar cell, complex characteristics, series resistance, analytical model

Extreme Learning Machine based Multi-Agent System for Microgrid Energy Management

Dounia EL BOURAKADI, Ali YAHYAOUY, Jaouad BOUMHIDI
LIIAN Laboratory, Computer Science Departemen, Faculty of Sciences Dhar-Mahraz,
Sidi Mohamed Ben Abdellah University Fez, MOROCCO
dounia.elbourakadi@usmba.ac.ma , ali.yahyaouy@usmba.ac.ma,
jaouad.boumhidi@usmba.ac.ma

Abstract— In this paper, an intelligent energy management system is presented for distributed structure like a smart microgrid. To model the microgrid, a Multi-Agent System is proposed based on Extreme Learning Machine algorithm to estimate the wind and photovoltaic power output from weather data. In this study a microgrid, with different generation units and storage units is considered. Provision of utility grid insertion is also given if the total energy produced by microgrid falls short of supplying the total load or if there is an excess of energy produced instead of to be wasted. Thus, the goal of our Multi-Agent System is to control the amount of power delivered or taken from the main grid in order to reduce the electricity bill and make profit by selling the surplus in the energy market. After supplying the load requirements, Extreme Learning Machine algorithm for classification is used to make decision about selling/purchasing electricity from the main grid, and charging/discharging batteries. Finally, for simulation, the Java Agent Development Framework platform is used to implement the approach and analyze the results.

Index Terms — Renewable energy, Microgrid, Prediction, Extreme learning machine, Multi-agent system.

The Experimental study of the drying kinetics of Mediterranean mussel (mytilus galloprovincilis) type by convective solar drying

M. Kouhila[1], A. Idlimam[1], A. Lamharrar[1], H. Lamsyehe[1], H. Moussaoui[1] and H. Mouhanni[2]
[1] Team of Solar Energy and Aromatic and the Medicinal Plants of High Teacher Training School Cadi Ayyad University, Marrakech, Morocco
[2] Electrochemistry laboratory for catalysis and environment, Ibn Zohr. University Agadir, Morocco
kouhilamounir@gmail.com

Abstract— This paper introduces a convective drying kinetics and hygroscopic behavior of Mediterranean mussels were studied as per the requirement for food products. An indirect forced convection solar dryer consisting of a solar air collector, an auxiliary heater, a circulation fan and a drying cabinet is used for the experiments. Experimental drying kinetics were measured at four air temperatures (40, 50, 60, and 70 °C), and two air flow rates fixed at (0.042 and 0.083 m^3s^{-1}) carried out in a partially thin film solar dryer. Eight mathematical models were compared in order to describe the drying curves of Mediterranean mussels. The logarithmic model showed the best fitting of experimental data in various aero-thermal conditions. The effective diffusivity varies from 1.1410 10^{-9} to 3.61 10^{-9} m^2s^{-1} for air drying flow rate of 0.083 m^3s^{-1} and varies from 1.35 10^{-9} to 2.66 10^{-9} m^2s^{-1} for an air-drying flow rate of 0.042 m^3s^{-1}.

Index Terms —Mediterranean mussel, drying Kinetics, Solar dryer, mathematical models, drying curves

Efficiency energy standards and labelling for residential appliances in Morocco

Ayoub OUBOURHIM and Khalil El-Hami
University of Hassan 1st, FPK, Laboratory of Nanosciences and Modeling
Khouribga, Morocco
a.oubourhim@uhp.ac.ma , khalil.elhami@uhp.ac.ma

Abstract— The emergence of new electrical appliances is the origin of the exponential increase in energy demand per capita in Morocco. The present paper focuses on improving energy efficiency for residential equipment in Morocco, through the requirement of a minimum energy performance standards and a labeling system that will guide the consumer to buy performant equipment. Detailed study of labeling scenarios as well as performance standards are elaborated for Tree appliances: televisions (TVs), refrigerators and air conditioners. For each considered product, we estimated the real consumption and the gain by introducing higher energy efficiency relative to a specific efficiency energy indicators and baseline technology. The results show that This constitutes a Major source of energy conservation and impacts the goals of Moroccan strategy in efficiency energy.

Index Terms —Energy efficiency, labeling, MEPS Minimum Energy Performance Standards

Wind And Photovoltaic Energy Availabilty And Its Cost Estimation For Tangier Region

L. Mellouk[1,2], K. Zine-Dine[1], M. Boulmalf[2], A. Aaroud[1], D. Benhaddou[3]
[1]Chouaib Doukkali University, Faculty of Science, El Jadida, Morocco
[2] TIC Lab, International University of Rabat, Morocco
[3] University of Houston, USA

Abstract— This work presents methodology and results used to estimate both wind and solar energies availability and their cost. The objective is to analyze the potential of these two major sources of alternative energy in Tangier region and to show their ability to replace fossil fuel energy sources especially for remote areas and agriculture applications. Thus, energy availability and its cost for these technologies are determined based on meteorological data, and their engineering and technical characteristics. The obtained results provide the hourly average energy production (in kWh) and its cost (in USD/kWh) for a maximum designed power output of 5kW for each technology and for each month in the year. Thus, these results show that energy production cost is ranging between 0.01 and 0.3 USD/kWh for solar energy using photovoltaic panels and it is ranging between 0.05 and 0.35 USD/kWh for wind energy using wind turbines with rated power equals to 1kW. Results of this work could be used as data estimation reference for engineering and research works related to renewable energy applications in the studied region.

Index Terms —Photovoltaic energy, Wind energy, energy availability, Cost estimation

The Behavior of a photovoltaic module under shading, in the presence of a faulty bypass diode

M. ZEBIRI, M. MEDIOUNI, H. IDADOUB
LASIM laboratory, National School of Applied Sciences (ENSA), Agadir, Morroco
m.zebiri@uiz.ac.ma

Abstract— Keeping low-cost industrial systems in operational condition has become a critical factor in business performance. At the moment, the forecast maintenance proves to be an essential activity in order not to incur untimely maintenance costs. In photovoltaic and wind renewable energy production systems where production is dependent on meteorological conditions, the study of the failures of these systems is essential in order to identify them and to be able to develop a working methodology to predict degradation and thus be able to maximize energy production. In this paper we will study the behavior of a photovoltaic (PV) generator composed of two modules which are M1 and M2. Since M1 is unshaded, we focus on M2 which is shaded and work at different irradiations levels with a bypass diode failure using the Power-Voltage (P-V) characteristics. Bypass diodes are critical components in PV modules that provide protection against shading. Failure of bypass diode in short circuit results in reducing the PV module power, while diode failure in open circuit leaves the module susceptible for extreme hotspot heating and potentially fire hazard. This study will enable us to be able to prematurely detect and locate these failures and thus guarantee a good efficiency in the maintenance interventions, a reduction in costs and, consequently, a better productivity by increasing the rate of availability of the installations. For that, we will simulate the electric model of a module under Psim software which is a complete modeling tool oriented towards electrical engineering and compare the results obtained with the model of the panel given by Psim library.

Index Terms —Photovoltaic, by-pass diode failure, Psim based simulation.

Performance analysis of grid connected photovoltaic plant in Tangier, Morocco

R. Herbazi[1], K. Amechnoue[1], A. Khouya[1], A. Chahboun[2], M. Diani[2], M. Louzazni[1] and M. Addou[2]
[1]University Abdelmalek Essaadi, ENSAT, Tangier 1818, Morocco
[2] University Abdelmalek Essaadi, FST, Tangier, Morocco
rachid.herbazi@gmail.com

Abstract— This paper analyzes and studies the performance of a 2 kWp grid-connected photovoltaic (PV) system installed on the roof of Faculty of Science and Technology, Tangier, Morocco at (latitude 35.737°N and longitude -5.896°W). The PV plant is consisting of 8 poly crystalline silicon modules connected in series and connected to the inverter. The system is fixed at an optimum angle of inclination of 32° facing south. The used data in this study were measured from January 2015 to December 2017, where the system supplied a total of 10.3095 MWh to the local grid, distributed as follows; 3410.969 kWh in 2015, 3224.937 kWh in 2016 and 3673.61 kWh in 2017. Monthly meteorological data such as solar radiation and ambient temperature were extracted from the PVGIS data source. The measured data over the two years 2015 and 2016 was used to evaluate the performance parameters of the PV system, includeing final yield, reference yield, performance ratio, capacity factor, system losses and system efficiency. During the year 2015, the final yield (YF) of the PV plant ranged from 3.153 kWh/kWp.day to 6.01 kWh/kWp.day, the annual performance ratio (PR) was 74.52%, the annual capacity factor (CF) was around 19.1%, and the system efficiency (ηsys) was 11.33%. For the year 2016, these parameters were 2.234 kWh/kWp.day to 5.894 kWh/kWp.day, 70.12%, 18.04%, and 10.66% respectively. These performances are compared with data obtained in similar conditions.

Index Terms — Grid-connected, Photovoltaic system, PVGIS, Performance, Final yield, Meteorological data

Structural study and FT-IR spectroscopy of the TTB ferroelectric $Sr_{2(1-x)}Na_{(1+x)}Gd_xNb_5O_{15}$ (SNGN)

A. Laaraj[1], E. El moussafir[1], A. Kamal[1], Y. Guaaybess[1], R. Adhiri[1], M. Moussetad[1] and B.Tbib[2]

[1]L.I.MA.T, Univ. of Hassan 2st, Faculty of sciences Ben M'sik, Casablanca, Morocco

[2] Laboratory of Nanosciences and Modeling, University of Hassan 1st, Faculty of Khouribga, Casablanca, Morocco

Abdelali.laaraj@gmail.com

Abstract— We synthesized The nanopowders ferroelectric $Sr_{2(1-x)}Na_{(1+x)}Gd_xNb_5O_{15}$ (SNGN) by solid-state method. Using X-ray diffraction (XRD) and FT-IR spectroscopy we studied the (SNGN) nanopowders over the composition range $0 \leq x \leq 1$. The X-ray results reveal an orthorhombic phase, with space group Pmmm for $0 \leq x \leq 0.8$ and a tetragonal phase, with space group P4mm ($a = b = 12.3343$ Å et $c = 3.9778$ Å), for $0.9 \leq x \leq 1$. These results are confirmed by the FT-IR spectroscopy who provide strong evidence of the reduction of the disorder in the TTB structure when going from Sr2+ to Gd3+ (from x = 0 to x = 1). This disorder is connected to the orthorhombic distortion, which is reduced when going from orthorhombic to tetragonal phase.

Index Terms — Solid-state, X-ray, diffraction, Space group, Ferroelectric

Optimization of a wind and PV Hybrid power system using Energy Storage System

Imane Worighi and Abdelilah Maach
Ecole Mohammadia d'Ingénieurs, University Mohamed V, Rabat, Morocco
imaneworighi@gmail.com, maach@emi.ac.ma

Abstract— With ever-growing demand for electrical energy and the major threat of fast depletion of fossil fuel reserves, renewable energy (RE) sources can be considered as a better option over conventional energy sources. Especially wind and solar has become one of the fastest growing technologies in the RE domain as their potential in reducing cost and providing power to meet the energy demand. Therefore, we need to test their integration into the smart grid since their intermittent, non-controllable and stochastic nature poses a fundamental challenge to grid stability. To do so, a virtualization of the system is overriding in order to test the implementation of such components and avert pricey operations. As a solution, a hybrid Microgrid model including wind, solar, loads and Energy Storage Systems (ESSs) is proposed. To validate our model, we focus on grid stability. In fact, ESS is the optimal solution necessary to maintain the stability of the power system. It allows accumulating the surplus energy for later use in those periods in which wind and solar contribute to overproduction. Moreover, it enables delivering back the extra energy in peak periods. The proposed model aims to match the required power demand and to reduce cost using an optimization of the system through ESSs. Simulation results show the effectiveness of the proposed model through a combination of wind, PV, double auction market and ESS. Furthermore, it evinces the impact of ESSs and their role in providing grid stabilization, enhancing power quality and reducing peak demand and energy cost.

Index Terms — component, renewable energy, smart grid, energy demand virtualization, Energy Storage Systems, peak periods

Effect of Erbium addition on optical and electrical properties of Polytetrafluoroethylene

Khalil El-Hami, Abdelghafour El moutarajji,and Bouazza Tbib Laboratory of Nanosciences and Modeling, FPKn University of Hassan 1st
khalil.elhami@uhp.ac.ma, el.moutarajji.abdelghafour@gmail.com , bouazza.tbib@gmail.com

Abstract— Our aim focused on semiconductor materials based on polytetrafluoroethylene (PTFE) doped by various concentrations of Erbium element (Er). The materials have been characterized by X-ray diffraction, optical properties of materials have been studied by UV-visible spectroscopy and spectroscopy of Fourier transform infrared (FT-IR). Our results showed a change of direct cell parameters of samples and information on micro strain of samples. It has been found that the increase in the percentage absorbance of Erbium grafted on PTFE that resulted in the increasing the absorption coefficient α, electrical conductivity and gap energy.

Index Terms — Semiconductor, X-ray diffraction, FTIR, optical properties, microstrain, electrical conductivity and Gap energy

Ontology-Based Context Agent for Building Energy Management Systems

YOUSSEF HAMDAOU and ABDELILAH MAACH
Depart. of computer science, Mohammadia Engineering School (EMI), Mohammed V Univ., Rabat, Morocco
youssefhamdaoui@research.emi.ac.ma, maach@emi.ac.ma

Abstract— Replacing existing electrical grids by future smart grids opens a several opportunities for energy-efficient operation of buildings and cities as well as improved coordination of energy load and supply. Future energy systems will be managed by smart controllers. These smart devices will have to interoperate, they need to exchange information with each other in order to cooperate over complex control tasks. Current data and communication technology provides a suitable basis for the bidirectional flow of information between smart buildings and other smart grid stakeholders. Interoperability will only be achieved when Smart Grid appliances share common semantics on the data they exchange. However, a common concept of shared real energy state and knowledge is essential in order to unify heterogeneous grid contexts, incorporate information of smart grid participants, and process this information in building energy management systems. In this work, a context agent based on an OWL ontology is presented that enables semantic representation of knowledge for interaction between building energy management systems and smart grids and end prosumers. A well-proven methodology is used to develop this ontology. Furthermore, the ontology application into building energy management systems and smart grid environments is figured, and the functional capabilities of this approach are shown.

Index Terms — Ontology, Smart Grid, MicroGrid, Buildings, energy management systems, efficiency, Multi Agent.

Performance of DFIG Wind Turbine using Dynamic Voltage Restorer based Fuzzy Logic Controller

Kaoutar RABYI and Hassane MAHMOUDI Electrical Engineering Depart.,
Mohammed V University, Mohammadia School of Engineers, Rabat, Morocco
rabyi.kaoutar@gmail.com

Abstract— In this paper a Doubly Fed Induction Generator (DFIG) based Dynamic Voltage Restorer (DVR) is proposed to handle voltage sag and swell when the DFIG is connected to the electrical grid, the DVR which is a constitution of three H-bridge inverters supplied through a common DC capacitor, can recover sag to 50%, alternatively it operates as an uninterruptable power supply when a failure occurs in the grid supply. The Fuzzy Logic Controller (FLC) is proposed to be used instead of proportionals controllers PI of the DVR because of its efficiency in nonlinear systems; there are two controllers in the grid side converter of the DVR which are replaced by two FLC, the simulations were carried out in simulink/Matlab software, the results show the reliability of the proposed DVR based FLC in terms of voltage sag and synchronization time.

Index Terms — Dynamic voltage restorer; voltage sag; doubly fed induction generator; fuzzy logic controller; power quality

Better Routing Strategies for Optimizing Energy in Wireless Sensor Networks

Mustapha EL QASEMY and Said RAGHAY
Laboratory of Applied Mathematics and Computer Sciences, FST, Cadi Ayyad University, Marrakesh, Morocco
elqasemy.mustapha@gmail.com, s.raghay@uca.ma

Abstract— Wireless sensor networks (WSN) is an active research domain. The evolution in the fields of antennae and transmission is a big motivation to improve the use of energy and communication management of WSN. However, new wireless sensor network topologies must make more effort to consider this approach. This paper presents better routing strategies for optimizing energy in Wireless Sensor networks.

Index Terms — Routing strategies, Optimizing Energy, Wireless Sensor Networks

Energy performance and environmental impact of an earth-air heat exchanger for heating and cooling a poultry house

Azzeddine Laknizi[1,2], Mustapha Mahdaoui[3], Abdelatif Ben Abdellah[1,2], Kamal Anoune[1,2], Mohsine Bouya[2]
[1]FST, Abdelmalek Esaadi University – Tangier, Morocco
[2]Depart. of Valorization and transfer, International University of Rabat ParcTechnopolis, Sala Al Jadida, Morocco
[3]Equipe de Recherche en Transferts Thermiques & Énergétique – Depart. os Physics FST, Univ. Abdelmalek Essaâdi Tanger – Morocco
eng.azzeddinelaknizi@gmail.com

Abstract— The poultry industry in Morocco is an important sector that contributes to the growth of national economy and food security, but this sector faces many problems, one of those problems is the climatic conditions, heat stress wave in summer and cold wave in winter that causes mortality and drops in performance (weight drop). Another problem is the relatively high consumption of conventional energy and corresponding environmental impact of the released greenhouse gas emissions. In this paper, a proposed system for heating and cooling a poultry house is modeled and simulated for the weather conditions of Tangier city-Morocco. The system consists of an earth-air heat exchanger, a mixing box, and an air-air heat recovery, which are combined to control the temperature inside the poultry house efficiently. The results showed that the proposed system has the potential to save between 34.7% and 96% of the energy demand in the heating mode and in the cooling mode respectively. The required number of tubes was found to be around 80 parallel tubes of 0.2 m in diameter and 30 m in length.

Index Terms — Earth-air heat exchanger, heat recovery, poultry house, cooling, heating, environmental impact.

Raman analysis of graphene/PANI nanocomposites for photovoltaic

Mourad BOUTAHIR, Jamal Chenouf, Brahim FAKRACH, Abdelhai RAHMANI, Hassane CHADLI, and Abdelali
Advanced Material and Applications Laboratory (LEM2A), University Moulay Ismail,FSM-ESTM-FPE, Zitoune, Meknes, Morocco
mourad.boutahir@gmail.com

Abstract— The nanocomposites based on graphene are singleor few-layer platelets that can be produced in bulk quantities by the in-situ polymerization method. Indeed, graphene is firstly added to a solution of the monomer. The polymerization is initiated either by heat or radiation. With this technique, a variety of polymeric nanocomposites have been prepared using the different types of graphene based nanofillers. Solution mixing techniques have been shown to represent the most effective for the dispersion of graphene nanosheets in polymers, in order to manufacture new high nanocomposite systems performance. In this experimental work, we report the synthesis and characterisation using Raman spectrometer of PANI and graphene/PANI. We study the vibrational properties of polyaniline (PANI) and graphene/PANI. We find a Charges/Energy Transfer in these promising materials, the graphene/PANI nanocomposites.

Index Terms — PANI , Graphene , Raman spectrometer

Performance and Complexity Comparisons of Polar Codes and Turbo Codes

Mensouri Mohammed, and Aaroud Abdessadek
Department of Computer Science, Faculty of Sciences El Jadida, Morocco
mensourimoh1@hotmail.com , a.aaroud@yahoo.fr

Abstract— Polar codes can be considered serious competitors to turbo codes in terms of performance and complexity. This paper provides a description of the Polar codes and the Turbo codes used by channel coding. Then, we undertake a comparison of Polar codes and Turbo codes based on several factors: BER performance, encoding complexity and decoding computational complexity. The performance of newly obtained codes is evaluated in term of bit error rate (BER) for a given value of Eb/No. It has been shown via computer simulations. They are employed as the error correction scheme over Additive White Gaussian Channels (AWGN) by employing Binary phase shift keying (BPSK) modulation scheme.

Index Terms — channel coding, Polar codes, Turbo codes, coding, decoding, Successive Cancellation algorithm, Max-log-MAP algorithm

Voltage sensitivity analysis for radial distribution system

Saad OUALI and Abdeljabbar CHERKAOUI
Lab. of Innovative Technologies (LTI), Abdelmalek Saadi Univ., Tangier Morocco
saad.ouali1@gmail.com , cherkaoui.lti@gmail.com

Abstract— This paper presents an analytical method able to quantify the influence of the variation of active and reactive power of any point of a radial distribution system on the network voltage. Obviously, changing in system parameters has an effect on the system performance. However, some may have significant impacts whereas others may have less important impacts. The main aim of this paper is to provide a study of the sensitivity of the network nodes voltage with respect to the variations of nodes powers, which can provide us some information about the influence of changing generation and load parameters on the system voltages. The results obtained may be very useful for choosing the optimal placement of distributed generation and reactive sources, and also to control the voltage plan of a radial electric network, through the evaluation of the impacts of each actuator. A case study is presented, with an application of the proposed method on the IEEE 15-bus system, which provides immediate access to qualitative and quantitative information on node voltages sensitivity, with referred to the distributed generation emplacement, typical conductor sections used with underground cable lines and overhead lines.

Index Terms —Voltage sensitivity, Radial distribution system, Backward/forward sweep, Medium voltage system.

Optimization of PV panel using P&O and Incremental conductance algorithms for desalination mobile unit

M. Bachar, A. Naddami, S. Hayani, and A. Fahli
Univ Hassan 1st ; Laboratoire Mathématiques Appliquées,Technologies d'Information et de Communication, Settat, Morocco
meryem.bachar@gmail.com

Abstract— The increasing demand for water and the depleting fossil fuels for its treatment made renewable energies a better alternative source for feeding water desalination units. Photovoltaic (PV) energy is an important source of renewable energy that could be an alternative to satisfy the broad energy needs in the future. Our project consists in the realization of a desalination mobile unit of brackish water based on solar energy which will serve as prototype for scientific research to develop many research axes. This prototype consists of different parts such as: The production of electrical energy by photovoltaic panels, DC/DC conversion, DC/AC conversion and water treatment. PV system produces maximum output power in only one point on Power-Voltage (P-V) curve called Maximum Power Point (MPP). When the weather conditions change (such as temperature and irradiation), the voltage and current in the circuit change. In this case, a new MPP must be found based on Maximum Power Point Tracking algorithms (MPPT) to optimize the power generated by PV. Hence, many methods have been developed to determine MPP. In this work, a comparison between two MPPT algorithms namely Perturb and Observe (P&O) and Incremental Conductance (InC) is presented. The simulations are accomplished by using a DC/DC Buck converter, a PV array and a load under MATLAB/Simulink environment. The obtained results, in different climatic conditions, reveal that the InC controller is more effective than P&O controller.

Index Terms —PV, MPPT, Buck Converter, Perturb and Observe, Incremental Conductance, MATLAB/Simulink.

Enhanced Predictive Model Control based DMPPT for Standalone Solar Photovoltaic System

Halima Ikaouassen[1], Kawtar Moutaki[1], Abderraouf Raddaoui[1] and Miloud Rezkallah[2]
[1]MEAT, Ecole Supérieure de Technologie Univ. Mohammed V, Salé, Morocco
[2]Electrical Engineering Depart., Ecole de Technologie Supérieure, Montréal (Québec), Canada
halimaikaouassen@research.emi.ac.ma

Abstract— This paper discussed an enhanced predictive model control (PMC) strategy based distributed maximum power point tracking DMPPT with a prediction horizon of one sampling time to achieve high performances from standalone solar photovoltaic systems in the presence of dynamic weather variations and partial shading. In this paper, three PV modules are interfaced to the DC-BUS through three cascaded DC-DC boost power converters used with the enhanced PMC based DMPPT algorithm to regulate the duty cycle of the power converters independently, and to supervise maximum power point of the three cascaded PV modules, in order to avoid mismatching phenomena between modules which is considered the main cause for performance degradation and efficiency drop. The performances of the proposed system and control strategy are verified and confirmed when comparing with other conventional MPPT methods such Perturb and Observe (P&O) algorithm based DMPPT using MATLAB/Simulink interface.

Index Terms —Enhanced predictive model control, DMPPT, standalone solar photovoltaic, dynamic weather, partial shading, cascaded DC-DC boost power converter, P&O.

Energy efficiency regulation and requirements: comparison between Morocco and Spain

Ikram Merini[1], Angel Molina-García[1], Mª Socorro García-Cascales[1] and Mohamed Ahachad[2]
[1]Universidad Politécnica de Cartagena, Cartagena, Spain
[2]Faculty of Sciences and Techniques, Abdelmalek Essaadi Univ., Tangier, Morroco
ikramalmerini@hotmail.com angel.molina@upct.es, socorro.garcia@upct.es, ahachad_med@yahoo.fr

Abstract— With the aim of reducing energy dependence and promoting economic development, Morocco has recently issued an energy plan to integrate both sustainable development and environmental protection. This strategy gives a novel thermal construction regulation in Morocco, provided by the Moroccan Energy Efficiency Agency. In terms of energy demand, building sector is currently the second most energy-intensive economic sector in Morocco; after the transport sector, accounting for 33% of the total energy consumption in the country (25% for residential and 8% for tertiary). This paper compares two countries geographically very close, such as Spain and Morocco, in terms of energy efficiency regulation, norms and requirements, discussing the parameters taken into account in both countries to determine their building thermal comfort levels. In this way, BINAYATE package software, proposed by Morocco for implementation and control of Moroccan thermal regulations is used to estimate the energy requirement of an ordinary building and the gain obtained by the application of the Moroccan and Spanish regulations. In addition, economic and environmental improvements of the Moroccan situation from the Spanish experience are also discussed and included in the paper.

Index Terms —Building thermal requirements, Thermal comfort, Energy demand, Regulation comparison

Lyapunov Function based Control for Grid-Interfacing Solar Photovoltaic System with Constant Voltage MPPT Technique

Kawtar Moutaki[1], Halima Ikaouassen[1], Abderraouf Raddaoui[1] and Miloud Rezkallah[2]
[1]MEAT, Ecole Supérieure de Technologie, University Mohammed V, Sale, Morocco
[2]Electrical Engineering Department ETS, Quebec Montréal, Canada

Abstract— In this paper nonlinear control design to obtain high performance from solar PV system using three-phase grid-connected LCL-filtered voltage source inverter is presented. The grid-connected system is modeled in the synchronously rotating frame. For perfect synchronization of solar photovoltaic and clean power injection to the grid new control based on Lyapunov function is used. Lyapunov function-based control is derived from the Lyapunov's direct method which guarantees the global stability of the closed-loop system. The output PV voltage is used as DC link voltage which will be maintained at its reference value using constant voltage MPPT tracking method. In the proposed control strategy, the measurement of inverter currents, capacitor voltages and grid currents are essential. The generation of reference functions in the d- and q-components can be achieved by using the reference d-component grid current. The performance of the proposed scheme and its developed control strategy, are validate using MATLAB Simulink.

Index Terms —Single-stage inverter, Photvoltaic system, Lyapunov function based control, Power quality, LCL filter

Optimal Power Control Strategy of a PMSG Using T-S Fuzzy Modeling

Abdennasser Benkada, Mohamed Monkade, Hamid. Chaikhy
University Chouaib Doukkali, El jadida, Morroco
Abdennasser.bk@gmail.com

Abstract— This article offers two different method control strategies to have the maximum power from wind turbine (WT) based on the Permanent Magnet Synchronous Generator (PMSG). The first control strategy is composed of standard proportional-integral (PI) regulators. The PI controllers are tuned for a specific operation mode. However, since the system is nonlinear, for different operating conditions, the values of the PI parameters may not be optimal. The second approach presents a new fuzzy tracking control method using Takagi-Sugeno (T-S) fuzzy of the WT, to achieve improved speed performance under different operating points. Finally, simulation results are provided to demonstrate the validity and the effectiveness of the proposed method.

Index Terms —Maximum power, wind turbine, PMSM, PI controller, Takagi-Sugeno fuzzy

Library Pruning for Power Saving During Timing and Electrical Design Rules Optimization

Mohamed Chentouf[1,3], Lekbir Cherif[1,2], and Zine El abidine Alaoui Ismaili[3]
[1]ICDS Department. Mentor Graphics, Mentor Graphics, Rabat, Morocco
[2]Laboratory of Systems Engineering, ENSA, Ibn Tofail Univ., Kenitra, Morocco
[3]Information, Communication and Embedded Systems (ICES) Team, Univ. Mohammed V, Rabat, Morocco
mohamed_chentouf@mentor.com , lekbir_cherif@mentor.com , z.alaoui@um5s.net.ma

Abstract— Timing optimization techniques are widely used to meet the frequency and electrical design rules requirement of integrated circuits, they use logical and physical transformation to speed up the problematic signals and to close the design setup and hold constraints. On the other side, each technique induces a power increase as a cost for signal speed up. In this paper, we propose a standard cell library tuning methodology to reduce the timing optimization impact on power increase. We divide each optimization step of the place and route process into two sub-steps, the first one uses only low power standard library cells and try to correct the maximum number of violations, and the second uses all the available cells in the library to close the remaining violations. Experimental results on 45 industrial designs of different processes show that the proposed methodology provides a leakage power reduction of 5%, a total power reduction of 1.3% and a timing improvement of 55.8% in Total Negative Slack and 37.5% in Worst Negative Slack.

Index Terms —library pruning, timing optimization, CMOS, electrical design rule constraints, electronic design automation, system on chip, physical design, place & route, power optimization

Prediction of time series of photovoltaic energy production using artificial neural networks

Abderrazzak Elamim[1], Bouchaib Hartiti[1], Abdelfattah Barhdadi[2], Amine Haibaoui[1,3], Abderrazak Lfakir[4] and Philippe Thevenin[5]
[1]ERDYS Laboratory, Hassan II University, Mohammedia, Morocco
[2]Energy Research Centre, ENS, Mohammed V University in Rabat, Morocco
[3]LIMAT Laboratory, Depart.of Physics, FSB, Univ. Hassan II, Casablanca, Morocco
[4]University Sultan Moulay Slimane FSTB, Beni Melall, Morocco
[5]LMOPS Laboratory, Department of Physics University of Lorraine Metz, France
elamimabderrazzak7@gmail.com

Abstract— This An artificial neural network (ANN) model is used for forecasting the power provided by photovoltaic solar panels using feed forward neural network (FFNN) of a photovoltaic installation located in the city of Mohammedia (Morocco). One year of hourly data on solar irradiance, ambient temperature and output PV power were available for this study. For this, different combinations of inputs with different numbers of hidden neurons were considered. To evaluate this model several statistic parameters were used such as the coefficient of determination (R2), the Root Mean Squared Error (RMSE) and the Mean Absolute Error (MAE). The results of this model tested on unknown data showed that the model works well, with determination coefficients lying between 0.99 and 0.998% for sunny days and between 0.88 and 0.96% for cloudy days.

Index Terms —photovoltaic installation, feed forward neural network, ANN

Adaline and Instantaneous Power algorithms for Offshore and Onshore Wind Farms based VSCHVDC for Oil Gas Station Application

Seghir Benhalima[1], Ambrish Chandra[1], Miloud Rezkallah[1] and Abderraouf Raddaoui[2]
[1]Department of Electrical Engineering, École de Technologie Supérieure, Notre-Dame Montréal, Québec H3C1K3, Canada
[2]MEAT, École Supérieure de Technologie, Univ. Mohammed V in Rabat, Salé, Morocco
elamimabderrazzak7@gmail.com

Abstract— In this paper High Voltage Direct Current system based on Voltage Source Converter (VSC- HVDC) connecting large–scale Offshore Wind Farm (LSOWF) for gas station, is presented. The three level Neutral Point diode Clamped (NPC) converter is used in VSC-HVDC system to improve the power reliability and transmission capacity. Exploitation of a platform Oil and gas industry has been used in the last few years, two options to run its machines either using a gas turbine or to convert the energy from coast by submarine cables. This issue is solved using a cleaner and less expensive renewable energy, such as offshore wind turbine. However, efficiency and safe operation of the gas platform in case of defect or system disturbance should be solved. To achieve these objectives, Photovoltaic system is employed to ensure stable operation of sensible elements of the platform during fault. Furthermore, crowbar protection topology, instantaneous power and Adaline algorithms are also employed to solve the problem caused by positive DC fault and to control the offshore and onshore VSCs. MATLAB/SIMULINK is employed to demonstrate and validate of the proposed concept. The proposed scheme may enable optimal integration of highly distributed of LSOWF and demonstrate the good performance of VSC-HVDC.

Index Terms —wind turbine, VSC-HVDC, three level converter (NPC), Photovoltaic, Adaline control, instantaneous power, crowbar protection

Performance analysis of 4.08 kWp grid connected PV system based on simulation and experimental measurements in Casablanca, Morocco

Amine Haibaoui [1,2], Bouchaib Hartiti[1], Abderrazzak Elamim[1], and Abderraouf RIDAH[2]
[1]ERDYS Laboratory, Hassan II University, Mohammedia, Morocco
[2]LIMAT Laboratory, Depart.of Physics, FSB, Univ. Hassan II, Casablanca, Morocco
Haibaoui.amine93@gmail.com

Abstract— The energy generated from photovoltaic (PV) panels depends usually on the PV cell technology used and meteorological data at a given location. This work presents a comparison study of 2x2.04 KWp grid-connected PV module technology systems, constituted by two types of photovoltaic solar panels (Monocrystalline and Polycrystalline)-silicon, installed on the roof of faculty of sciences Ben M'sik Casablanca. Three types of results are presented. The first type is the performance evaluation for one year of exposure under natural outdoor conditions including: System efficiency, reference and final yield as well as the performance ratio. The second type is based on simulation data given by PVsyst 6.4.3, compared to experimental data obtained through the inverters of the installation and meteorological station. The third type is an economic analysis including the most commonly used financial parameters, which are the annual incomes (Ai), the cost of electricity of operating period (LCOE) and the payback period (PB) in order to determine the optimal technology for the city. The investigation of the annual productivity shows that Monocrystalline and Polycrystalline deliver an energy of 3325,711 Kwh/year and 3250,842 Kwh/year respectively. The experimental results show that the monocrystalline-silicon is the best technology for Casablanca city.

Index Terms — Performance analysis, Simulation, Economic analysis, PV cell, grid-connected, Monocrystalline, Polycrystalline.

Energy Study Of Different Solar Water Heating Systems In MENA Region

Mohamed Amine Ben Taher, Abdelmounim Al Jamar, Firdaous Akzoun, Mohammed Ahachad and Mustapha Mahdaoui

Department of Physics, UAE, Faculty of Science and Techniques of Tangier, Tangier, Morocco

mustapha_mahdaoui@yahoo.com

Abstract— This article presents an energy study during the year associated with the results of two solar water heating systems with flat plate collectors (FPC) and evacuated tube collectors (ETC) operating in the Middle East and North Africa (MENA) region. Annual simulations are performed using the TRNSYS software by considering a typical meteorological year (TMY) for all countries in the MENA region. The energy performance of the two systems was compared on monthly and yearly basis. It is found that high values of solar fraction and collector efficiency can be reached in almost the studied regions with the preference of using (ETC).

Index Terms — MENA; Flat Plate Collector; Evacuated Tube Collector; Solar Fractin; System efficiency; TRNSY

Study and impovement of the FMECA in a production way

Ilyas Mzougui and Zoubir El Felsoufi
Team of Mathematical and control modelization, Faculty of Sciences and Technologies, Abdelmalek Essaadi University.Tangier, Morocco
Ilyas.mzougui@gmail.com , Elfelsoufi_zoubir@yahoo.fr

Abstract— Failure mode and effect and criticity analysis is a tool highly used for the identification and the elimination of the failures. He has been used in the first time by the national aeronautics and space agency on 1977. He has been created as a development methodology. Since that, many works have been established to improve it some of them use probabilistic methods. Some others use the Multi criteria decision making. But as we know, there is any works that try to solve the interdependency problem in this tool. This is what we will try to do in this article.

Index Terms — FMECA, interdependency, DSM, Severity, Occurence, Detection, Criticity, RPN.

Ship operational mesures implementation's impact on energy-saving and GHG emission

Abdelmoula Ait Allal, Khalifa Mansouri, Mohamed Youssfi and Mohammed Qbadou
Labaratory: Signals, Distributed Systems and Artificial Intelligence (SSDIA), ENSET Mohammedia, University Hassan II, Casablanca, Morocco
Aitallal.abdelmoula67@gmail.com, khmansouri@hotmail.com, med@youssfi.net, qbmedn7@gmail.com,

Abstract— The improvement of ship operation efficiency and the environmental protection are the main pillars for a competitive and sustainable shipping industry. This sustainability depends on the fluctuation of the fuel price market, compulsory international maritime organization environmental regulations and the shipowners policy regarding the energy-saving and their commitment in the reduction of greenhouse gas emission. To ensure a sustainable competitiveness and compliance with environmental requirements of their fleets, the shipping companies have implemented several innovative solutions. Some innovative solutions might be implemented at ship design stage, while others might be implemented at ship operation stage. This paper focuses on the solutions which might be implemented at the operation stage, i.e. ship speed optimization, weather routing optimization, ship trim optimization and hull and propeller condition-based maintenance. The effectiveness of these solutions has been demonstrated through study of ship voyages performance reports and simulation of case study.

Index Terms — Environment, energy-saving, GHG emission, trim Optimization, shipping, autonomous ship

An automatic system for water meter index extraction

Naim Ayman, Abdessadek Aaroud and Said Saadani

Department of Computer Science, Laboratory LAROSERI, Faculty of Sciences
Chouaib Doukkali University, EL Jadida, Morocco
aymannaim10@gmail.com, aaroud.a@ucd.ac.ma, Said.saadani@gmail.com

Abstract— Water meter is used as a tool to calculate water consumption. This tool works by utilizing water flow and shows the calculation result with mechanical digit counter. Practically, in everyday use, an operator will manually check the digit counter periodically. The Operator makes logs of the number shows by water meter to know the water consumption. This manual operation is time consuming and prone to human error. therefore, we propose in this article an Android mobile application that calculates the customer's water consumption in real time. By having a Smartphone supporting applications that run on Android, the customer can access his water bill at any time by creating his own subscriber account. Once the subscriber account has been created, the subscriber can take an image of his water meter which will subsequently be sent to the server for processing, the level of consumption as well as any alerts will be transmitted to the citizen on his Smartphone according to the image sent. The customer will, of course, be connected to the Internet to use this application.

Index Terms — character recognition; binarization; consumption; viola jones method; eigenfaces method

Control of a Proportional Resonant Current Controller Based Photovoltaic Power System

Essaghir Soukaina and Benchagra Mohamed
ISERT Laboratory, Univ. Hassan 1, ENSA-Khouribga, Khouribga, Morocco
essaghirsoukaina@gmail.com, m.benchagra@gmail.com

Abstract— This paper presents a power factor control of PV system connected to the grid. A Proportional-Resonant (PR) controller is used for replacing the conventional Proportional-Integral (PI) controller in this system. By comparison with the conventional PI control method, the PR control can introduce an infinite gain at the fundamental frequency and hence can achieve zero steady-state error. In order to examine the effectiveness of the suggested control, a simulation using the Matlab/Simulink software has been done and it's concluded from the simulation results that the presented control by using the PR controller can be able to maintain maximum active power and to keep always a unity power factor despite variation load.

Index Terms — PV System, Proportional Resonant PR, Proportional Integral PI, VSI, Unity Power Factor, Grid.

Environmental and technical criteria of cement-SSA mixtures

Sara Naamane, Fatima zahra Bouaich, Nour El Hoda Mtarfi, Zakia Rais, Mustapha Taleb
Laboratory of electrochemical engineering, modeling and environmental, Faculty of Sciences Dhar El Mehraz., Fez, Morocco
saranaamane@hotmail.com

Abstract— This work investigates the properties and the leachability of the waste material obtained from the incineration of sewage sludge, i.e. sewage sludge ash (SSA), and its influence, at various percentages, on workability, strength and leachability of cement-based mortars. The SSA were characterized by inductivity coupled plasma-atomic emission spectrometer, X-ray Diffraction, scanning electron microscopy, and Fourier Transform Infrared analysis. The cements containing SSA were characterized physically and mechanically. In addition, the leaching behavior of heavy metals in SSA and SSA- mortars were assessed using NF EN 12457 and NF PX31-211 leaching tests. Results illustrate that the leaching behavior of SSA shows an important release of Cr, Mo, Ba, Sr, V, Zn and Al. While, the leaching behavior of mortars containing different amounts of SSA was satisfactory and the heavy metals were successfully immobilized in cement matrix.

Index Terms — Sewage sludge ashes, Cement, Physico-chemical and mechanical characterization, leaching behavior, Environmental evaluation

Dimensioning of the coldroom in a solar adsorption cooling system using Moroccan climate data

Hanane Abakouy[1], El Kalkha Hanae[2] and Adel Bouajaj[2]
[1]Laboratory of innovative technologies, National School of Applied Sciences Tangier,
[2]Morocco Department of Industrial and Electrical Engineering, National School of Applied Sciences, Tangier, Morocco
hananeabakouy@gmail.com, elkalkha_hanae@yahoo.fr, dbouajaj@yahoo.fr

Abstract— The present study proposes a contribution to the optimization of solar adsorption cooling system, in this paper the dimensions of the coldroom containing the evaporator is studied. The aim of this study is to determine the influence of the insulation thickness of the coldroom and climate data on the cooling load using Moroccan climate data.

Index Terms — cooling, thermal enregy, adsorption, cold room, evaporator

Numerical study on turbulent flow forced-convection heat transfer from Heated Baffles in a Horizontal Channel

Kamal Amghar, Mohamed Ali Louhibi and Najim Salhi
Laboratory of mechanics and energy, Mohammed First University, Faculty of sciences, Oujda Morocco
amgharkamaler@gmail.com

Abstract— This work presents numerical results of forced convection turbulent in a horizontal channel provided with heating two baffles mounted on its lower wall. The upper and lower surfaces are maintained at the high temperature and the fluid inlet temperature is lower than the temperature of the walls Calculations is made by using a finite volume method and an efficient numerical procedure is introduced for studying the effect of inclination angles on heat transfer and flow field for air and high Reynolds number. Results are reported in terms of isotherms, streamlines, local Nusselt numbers, profiles velocity and temperature. Overall, we can conclude that the results of the study show that the inclination angles of the heated plate alter significantly the temperature distribution, the flow field and the heat transfer in channel. It was found that the total heat transfer in a horizontal channel mounted the obstacles is increased under effect increase of inclination angle of baffle.

Index Terms — Heat transfer, Heated baffles, Forced convection, Turbulent flow, Numerical study.

Optimized Energy Management of Electric Vehicles Connected to Microgird

Youssef Hamdaoui, and Abdelilah Maach
Department of computer science, Mohammadia Engineering School (EMI),
Mohammed V University, Rabat, Morocco
youssefhamdaoui@research.emi.ac.ma, maach@emi.ac.ma

Abstract— As an important part of renewable energy utilization and smart distribution, the increasing penetration of electric vehicles for the rapid growth in load demand and especially electric vehicle can be a smart solution for the islanded microgrid or in an emergency outage case. The electric vehicle is not a new concept and has been conceptually and practically available for the last century and will change the financial as well as environmental attractiveness of onsite generation (e.g. PV, or fuel cells). In islanded mode, based on the power balance between renewable electric sources and loads, the energy management and dispatch of EVs and PV are optimized to minimize the operational cost and maximize the benefit of islanded microgrid. This paper presents an efficient power management based on mobile power stored in electrical vehicle and power produced by solar panel in a residential distribution and focuses on the analysis of the optimal interaction of electric vehicles with householder's network, which may include photovoltaic (PV) for an efficiency energy management system. The effectiveness of the proposed strategies for the optimized operation of EVs is validated by case studies and performances analysis.

Index Terms — islanding, microgrid, distribution network, classification, regional data center, selection, classification, solar panel, Electric vehicle, energy management

Influence of Glass Properties in the Performance of a Solar Cooling AC-NH3 Adsorption Machine

H. El Kalkha[1] and A. Mimet [2]
[1]Laboratory of innovative technologies, National School of Applied Sciences, Tangier, Morocco
[2]Energetic Laboratory, Sciences Faculty, University Abdelmalek Essaidi, Tetouan, Morocco
elkalkha_hanae@yahoo.fr , abdelaziz.mimet@uae.ma

Abstract— This work presents the results of the development of a dynamic model aiming to contribute to the design and performance evaluation of an ammonia-activated carbon adsorption solar cooling systems using a sensor with two different types of glass, one normal and other selective. Model takes into account the transient behavior of input variables as solar radiation and ambient temperature and it calculates, according certain initial parameters and a given solar flux, the internal system temperatures, the adsorbed mass and the pressure of the reactor. This allows us to calculate with good accuracy the cycled mass of refrigerant, the quantity of cold produced in the machine and the performance coefficient of solar refrigerating machine. The solar collector used for converting solar energy to heat is a solar flat plate collector. The model is applied to the performance evaluation and the calculation of amount of cold produced of this kind of devices in different locations at Morocco.

Index Terms — Solar energy, adsorption coolin, amount of cold produced, Performance Coefficient.

Microwave assisted catalytic oxidation of benzene with hopcalite

Lv Li, Song Hua, Wang Desheng and Wang Chunyu
Research Institute of Chemical Defense, Beijing 100191, China
elkalkha_hanae@yahoo.fr , abdelaziz.mimet@uae.ma

Abstract— In order to explore an efficient and rapid method for treating typical volatile organic compounds, it was proposed that benzene was catalytically oxidized withhopcalite under microwave irradiation. The decontamination performance under different conditions were studied, and the influences of some factors on the benzene conversion ratio were tested, such as microwave irradiation power, initial benzene concentration, catalyst amount and gas humidity. Results showed that benzene conversion ratio could reach 99.2% when microwave power, initial benzene concentration, gas flow and catalyst bed height were 70W, 1917mg/m3,1.0L/min, and 3.86cm separately. It is concluded that microwave irradiation can promote the catalytic oxidation of benzene with hopcalite and it has higher energy efficiency than traditional heating.

Index Terms — wordsmicrowave, catalytic oxidation, hopcalite catalyst, benzene

Towards an intelligent data analysis system for decision making in medical diagnostics

El Khatir Haimoudi[1], Mostafa Ezziyyani[2] and Otman Abdoun[1]
[1]Computer Science Department, Laboratory of Advanced Sciences and Technologies Polydisciplinary Faculty, University UAE, Larache, Morocco
[2]Mathematics and Application Laboratory, Faculty of Science and Technics, University UAE, Tangier, Morocco
helkhatir@gmail.com , abdoun.otman@gmail.com , ezziyyani@gmail.com

Abstract— artificial neural networks (ANN) are currently massively used in different fields, especially for very complex problems. In this work we propose an approach to use these systems, and in particular the paradigm of the self-organizing map (SOM) in the medical field. The idea is to use this paradigm to develop an intelligent system able of learning to analyze, classify, and visualize multi-parameter objects in a reduced two-dimensional space in the form of object maps. This approach allows for the visual analysis and interpretation of data to reveal the most informative indicators for decision making. The application in the medical field aims to help make a very good diagnosis to make the most relevant decisions in order to provide appropriate treatment depending on the patient's state.

Index Terms — Data analysis, Artificial Neural Networks, Self- Organizing Map, Learning, Classification, Visually Vnterpreting, Medical Information Systems, Medical Diagnostics, Decision Making.

Omnet++ Simulation of Facial Nerve Monitoring in Real Time Neurosurgery Based on WBAN

Asma Ammari, Rachida Saouli
Faculty of Computer Science "LINFI", Mohamed Khaider University, Biskra, Algeria
asmaammari902@hotmail.com, rachida.saouli@esiee.fr

Abstract— Neurosurgery is one of the most critical medical fields. The neurosurgeons deal with nerves sensitive situations such as paralysis. For the sake of avoiding those risks, the neurosurgeon operates while the patient is partly awake. We are interested in this paper to handle the case of the facial nerve which can be altered during an intervention at the ponto-cerebellar angle specialty of a neurosurgeon expert. In this case wired systems, based on electromyography "EMG" technology, were used in parallel with visual monitoring. However, we have proposed a model of automated system based on Wireless Body Area Networks "WBAN" for facial nerves intraoperative monitoring. Our model is based on active synchronized stimulations. For the aim of assuming the patient comfort also, to add more flexibility to the neurosurgery our proposed model benefits from wireless communication instead of wired connections. We distinguish four scenarios deployed according to the facial muscles anatomy and simulated using OMNet++. The results, obtained by comparing the four scenarios, allowed us to define the optimal scenario according to a set of criteria (the system delivery time, the communication time, the energy consumed, and data processing time).

Index Terms — Neurosurgery; Facial nerve monitoring; WBAN; OMNet++

Statistical and predictive analytics of chronic kidney disease

Safae Sossi Alaoui, Brahim Aksasse and Yousef Farhaoui
Moulay Ismail University, Faculty of Sciences and Techniques, Depart. Of Computer Science, M2I Laboratory, ASIA Team. Boutalamine, Errachidia, Morocco
sossialaouisafae@gmail.com, baksasse@yahoo.com , youseffarhaoui@gmail.com

Abstract— Currently, health problems increasingly intrigue the curiosity of data scientists. In fact, data analytics as a rapidly evolving area can be the right solution to manage, detect and predict diseases which threaten human life and cause a high economic cost to health systems. This paper seeks to establish a statistical and predictive analysis of an available dataset related to chronic kidney disease (CKD) by employing the widely used software package called IBM SPSS. Indeed, we manage to create a 100 % accurate model based on XGBoost linear machine learning algorithm for successful classification of patients into; affected by CKD or not affected.

Index Terms — Chronic kidney disease, statistics, predictive analytics, IBM SPSS, machine learning, classification

An Innovative Approach to Involve Students with Learning Disabilities in Intelligent Learning Systems

Fatimaezzahra Benmarrakchi, Nihal Ouherrou, Oussama Elhammoumi and Jamal El Kafi
Computer Science dept, Chouaib Doukkali University, El Jadida, Morocco
benmarrakchi.f@ucd.ac.ma, ouherrou.n@ucd.ac.ma, elhammoumi.o@ucd.ac.ma, jelkafi@gmail.com

Abstract— Innovations in healthcare education have fostered the development of assistive technologies which have contributed to making the learning environment and information more accessible to learners with learning difficulties. Especially, Intelligent Tutoring Systems (ITS) have proven the benefits of personalized learning. One of the distinctive features of the intelligent system is its Learner Model (LM). In this paper, we propose a LM that takes into consideration individual differences and tends to adapt system parameters for learners with Specific Learning Disabilities (SLD) before the session begins. The purpose of this research is the development of conceptual bases and a constructional approach of a cognitive LM founded on differentiation. However, developing ITS requires many resources and information about learners as well as it demands a long time to build. To facilitate the design process, we propose a LM, called UPCLEE that takes into account several dimensions of learner's profile. This research demonstrates how the proposed model's levels are taken into account in the design of ITS and how it can be used to provide personalization in computer-based educational systems. In this study, we collected observations, interviews, and surveys and we used a grounded theory approach to develop our LM, then we conducted a user study with 12 students (4 with SLD) to validate our proposed model.

Index Terms — Healthcare education, Information and Communication Technology (ICT), Specific Learning Disabilities (SLD), Intelligent Tutoring System (ITS), User experience, Learner model (LM)

A new method based-Gentle Adaboost and wavelet transform for breast cancer classification

Khalid Auhmani[1], Nezha Hamdi[2], Moha Mrabet Hassani[3] and Omar Elkharki[4]
[1]Depart. of Industrial Engineering, National school of applied sciences, Cadi Ayyad Univ., Safi, Morocco
[2]High institute of engineering and business (ISGA), Marrakech, Morocco
[3]Depart. of Physics, FS Semlalia, Cadi Ayyad Univ., Marrakech, Morocco
[4]Faculty of sciences and technologies, Tangier, Morocco
k.auhmani@uca.ma

Abstract—In this paper we have realized a comparative study of mammograms classification accuracy based on a new Gentle Adaboost algorithm for different wavelet transforms and different features. Our proposition deals with the combination of a new Gentle Adaboost based algorithm with three wavelets transforms. In this new algorithm, the main classifier is realized by weighted weak classifiers. These weak classifiers are constructed from the sub-bands of discrete wavelet transform, stationary wavelet transform and double density wavelet transform. Used features are extracted from transformed mammograms. We have investigated the effect of these wavelet transforms combined with the extracted features on the classification accuracy. Receiver Operating Curves (ROC) tool is employed to evaluate the performance of the propositions. Mammograms of MIAS Database are used as samples to classify. true positive rate is plotted versus false positive rate for different types of features and for Gentle Adaboost iterations. Results showed that the best area under curve (AUC), is reached for Zernike moments combined with double density wavelet transform and it is equal to 1 for both t=10 and t=50

Index Terms — Artificial intelligence, image processing, Machine learning, Gentle Adaboost, wavelet transform, ROC, Feature extraction

A Conditional Sentiment Analysis Model for the embedding patient self-report Experiences on Social Media

Hanane Grissette and Elhabib Nfaoui
LIIAN Laboratory, Department of computer science, Sidi Mohamed ben Abdellah University, Fez Morocco
Hanane.grissette@usmba.ac.ma, Elhabib.nfaoui@usmba.ac.ma

Abstract—Getting accurate, honest, reliable and credible minute insight is the most crucial objective of conducting medical and pharmaceutical research on social media. Nowadays, healthcare manufacturing companies use Sentiment Analysis (SA) to identifying the misleading of patients self-report experiences and shared medical information on social media. As a target level of analysis, a set of medical components in each document (post, message, tweet, etc.) have a semantic formalism which, similar to a dependency parse in the whole space of analysis regarding the time axes. However, Time property is being substantially very important allowing more real-time personalization to efficiently detect patient emotional state and what may be suffering from. Specially, when an irregular sentiment towards drugs or set of events may cover. In this paper, we aim at defining a conditional Sentiment Analysis model which summarizes sentiment information looking at the historical data towards dependent entities for yielding short or long-term predictions based on quantifying exactly what change is. This model hybrid an unsupervised biomedical concept extraction with autoregressive time series modelling. This hybridization aims at online updating the model by smoothing and extracting new relevant target features when deals specifically with newly emerged diseases, medical events, Drug issues and potential side effects. The evaluation results on a real pharmaceutical industry and healthcare tweets show that our proposed oriented-context method performs better than existing models.

Index Terms — medical information, sentiment analysis, patient self-report, Social Media, Healthcare ,time series modelling

Clustering and social recommendation applied in health community of practice

Meriem HAFIDI, El Hassan Abdelwahed, Sara Qassimi, and Rachid Lamrani
Computer Systems Engineering Laboratory, University of Cadi Ayyad, FSSM, Marrakech, Morocco
meriem.hafidi@ced.uca.ac.ma , abdelwahed@uca.ac.ma ,
sara.qassimi@ced.uca.ac.ma , rachid.lamrani@ced.uca.ac.ma

Abstract—Social networks are increasingly used to exchange information. The social users are the main origin of the shared web resources and contents. However, they are also influenced by these shared data. The exchanges and interactions produced are an important element for defining the profiles of these users. In this paper, we investigate modeling of individuals using a user centered model, in particular the activity and social pressure features. We propose a user profile enrichment approach based on extracted tags from shared resources. Our goal is to link similar users in order to build sub-networks according to users' profiles. Thus, determining the central and important nodes in the network will establish basis for the web resources recommendation, information diffusion and community resuscitation. Our research will interest doctors' communities to share their knowledge through network. It will teach the most basic health care information to the patients of certain chronic diseases such as diabetes.

Index Terms — Social networks, User profile, Dynamic of interactions and Communities detection, Recommendation, Collective intelligence, Health community of practice

The metabolic syndrome: prevalence, associated risk factors and health complications in obese subjects in northern Morocco

Nadia Hamjane[1], Fatiha Benyahya[2], Mohcine Bennani Mechita[1], Naima Gailani Nourouti[1] and Amina Barakat[1]
[1]Laboratory of Biomedical Genomics and Oncogenetics, Abdelmalek Essaadi University, Tangier, Morocco
[2]Institute Pasteur, Tangier, Morocco
hamjanenadia@gmail.com

Abstract—The metabolic syndrome (MetS) is a major public-health problem, it is characterized by a collection of metabolic abnormalities including central obesity, hypertension, dyslipidemia and insulin resistance. MetS is associated with increased risk of developing type 2diabetes (DT2) and cardiovascular diseases (CVD). This study aimed to estimate the prevalence of metabolic syndrome and associated risk factors as well as its health complications in an obese adult population of north of Morocco. This is a cross-sectional study that was undertaken on a population of 485 obese subjects, 339 women and 146 men. A structured questionnaire was used to collect data on demography, lifestyle, medical history and biological parameters. Anthropometric indices and blood pressures were measured. The mean age of our patients is of 49±11 years, the average of body mass index of the patients is of 34.2 ± 7Kg/m ², and the waist circumference average is of 106.9 ± 15cm for the women and 104.5± 12 cm for the men. Obesity is of class I in 38% of the subjects, class II in 25% of the subjects, class III in 13% of the subjects, and 24% of the subjects have an overweight. The prevalence of MetS was 52.4%, higher in females than male participants (59.24% vs 35.97%) and it increased with age, with the highest prevalence in the age group >50 years. Also, 43.6% of patients have one or two risk factors for developing this syndrome. 28.1% have three and 18.7% expressed four of them. The most commonly associated risk factors in our population were abdominal obesity plus hyperglycemia plus low HDL cholesterol. The complications found in our population are type2 diabetes and it complications in 42% of the cases and cardiovascular disease in 32%. Our study shows that metabolic syndrome is highly prevalent among obese patients. The most prevalent component of metabolic syndrome in our population was abdominal obesity and hyperglycemia. Targeting obesity and sedentarity by adapting lifestyle changes is the main solution for the prevention and treatment of the metabolic syndrome in order to prevent the risk for cardiovascular diseases.

Index Terms — Metabolic syndrome, BMI, obesity, complications

Agile decision support system for the management of tensions in emergency services using AIS techniques

Mouna Berquedich[1], Oualid Kamach[1], Malek Masmoudi[2], and Laurent Deshayes[3]
Lab. of Innovative Technologies (LTI), Abdelmalek saâdi Univ., Tangier, Morocco
Lab. of industrial engineering, Jean Monnet Univ., Roanne, France
Berquedich.mouna@gmail.com , kamach@ensat.ac.ma ,
malek.masmoudi@univ-st-etienne.fr , laurent.deshayes@um6p.ma

Abstract— The purpose of an agile approach of decision support to manipulate and capitalize the knowledge is the subject of this article. We present one of the bio-inspired computer techniques to provide decision-making assistance of hospital decision makers facing massive patient flows. In fact, the Artificial Immune System, (AIS), has been adapted as a technique designing hospital piloting assistance system. This assistance system helps hospital decision makers in their quotidian activities. The major objective is to present basic concepts of a new approach aiming to supply hospital decision-makers with relevant traces to assist their decision-making in the difficult situations that put them under stress. In order to design the system, we relied two mechanisms of AIS techniques: negative, and clonal selections. The agility aspect of the system was assured by adopting the component approach. In this paper, we are particularly interested by increasing reception capacity via coordination networks among several regional hospitals. Meanwhile, guaranteeing the safety of the hospitalized patients in each hospital. The leading purpose is offering a good decision-making decreasing the tension. The selection of solutions is based on the guiding principles of the white plan.

Index Terms — Hospital environment, AIS, Negative selection, Clonal selection.

Decision system for the selection of the best therapeutic protocol for breast cancer based on advanced Data mining : A survey

Sarah Khrouch[1], Mostafa Ezziyyani[1] and Mohammed Ezziyyani[2]
[1]FST, University Abdelmalek Essaidi, Tangier, Morocco
[2]Polydisciplinary Faculty of Larache Univ. of Abdelmalek Essaâdi Larache, Morocco
rhksara@gmail.com

Abstract—Sometimes the experience of Doctors is not enough sufficient to guide patients perfectly and predict exactly the best treatments to follow and give results with high accuracy. For this reason, it is very important to get a predictive model, resulting in effective and accurate decision making. Our main goal is to make a significant contribution toward improving the quality of care. This work strives to create a dynamic graph of treatments which is able to predict the suitable therapeutic protocol. The objective of this graph is to help doctors classify breast cancer patients depending on the type of breast cancer and the appropriate therapeutic protocol and the optimal dose. In this article we focus on the use of the patient's personal data and medical history for each patient, input features and the medical tests that patient already have done. The predictive model is based on machine learning like Neural Network, as well as on different input features and using advanced Data mining algorithms.

Index Terms — Breast cancer, machine learning, Neural Network, therapeutic protocol, Data mining, predictive model

Obtaining an X-ray of the Zubal Phantom by Monte Carlo simulation using MCNP code

Hassane El bekkouri, Abdessamad Didi, Ahmed Dadouch, Abdelmajid maghnouj
Sidi Mohamed Ben Abdelah University Fez, Morocco
Hassane.elbekkouri@usmba.ac.ma , ahmeddadouch@hotmail.com

Abstract— Radiation transport in matter has attracted great interest since the beginning of the 20th century. High-energy photons, electrons, and positrons penetrate the matter undergoing multiple interactions where his energy is transferred to the atoms and molecules of the material, and secondary particles are produced. By multiple interactions a high energy particle produces a cascade of particles that is usually referred to as a shower. In each interaction, the energy of the particle is reduced and particles can be generated so that the evolution of the shower represents a degradation of the energy. The purpose of this work is to obtain x-ray images of the human body using the Zubal phantom. The transport of the radiation, crossing the ghost and arriving on the detector, is realized using the code MCNP-6. The images obtained are comparable to those obtained by a real radiological imaging system.

Index Terms — Monte Carlo Code, simulation; radiography, X-ray

Efficient Lung CT Image Segmentation using Mathematical Morphology and the Region Growing algorithm

Abdelhamid El Hassani, Brahim Ait Skourt and Aicha Majda

Abstract—Computer Aided Diagnosis (CAD) systems are often used during Today's medical practicality. It helps the physician to perform an accurate detection and diagnosis of Lung Pathologies. Lung CT image segmentation is a prerequisite in lung CT analysis. In this paper we proposed an automated hybrid method for lung segmentation based on both mathematical morphology and the region growing algorithm. the seed points are selected automatically without any user interaction. Also, the structuring element used in mathematical morphology operation is dynamic and it changes its shape and parameters according to the input 2D lung CT slices.

Index Terms — Lung CT image segmentation, Mathematical morphology, Region Growing, Dynamic structuring element

Genetic K-means Clustering Algorithm for Achieving Security in Medical Image Processing over Cloud

Mbarek Marwan, Ali Kartit and Hassan Ouahmane
LTI Laboratory, ENSA, Chouaïb Doukkali University, El Jadida, Morocco
marwan.mbarek@gmail.com , alikartit@gmail.com, hassan.ouahmane@yahoo.fr

Abstract—In healthcare domain, there is persistent pressure to improve clinical outcomes while lowering costs. In this respect, healthcare organizations can leverage cloud computing resources to avoid building an expensive in-house data center. More specifically, this new trend offers the opportunity to rent the use of imaging tools in order to process medical records. Additionally, cloud billing is based on a pay-per-use model to achieve cost savings. However, security and privacy concerns are the main disadvantages of cloud-based applications, especially when it comes to managing patients' data. The commonly used techniques for protecting data are homomorphic algorithms, Service-Oriented Architecture (SOA) and Secret Share Scheme (SSS). These traditional approaches have some limitations that provide a boundary to its use in practice. Precisely, the implementation of these security measures in cloud environment does not have the ability to maintain a good balance between security and efficiency. From this perspective, we propose a hybrid method combining a genetic algorithm (GA) and K-Means clustering technqiue to meet privacy and performance requirements. This approach relies on distributed data processing (DDP) to process health records over multiple systems to help to protect against accidental disclosure as well as accelerating the computation. The simulation results prove clearly the effectiveness and correctness of this method in securing cloud applications

Index Terms — Image processing, Cloud, K-Means, Security, Genetic algorithm

E-health 2.0 or the Human 2.0

Moulay Hicham EL AMRANI
Ibn Zohr University, Agadir
elamrani@mondeannuaires.com

Abstract—In the few last years, the revolution of big data in the industry is a new field of research and source of riches to many businessmen. The healthcare gets benefits of the massive amounts information of the big data that it never had access to before. It let to have access to billion of samples, that can do any experience on it, then, gets more efficient results. The new technologies lead to create more health apps and personnel fitness tools, which permit to have more sources of downloadable patient data. That has surely a double face, the first one, the data is going to help to find more medicines for several diseases, in the other hand, the question that will be hold is the data's security, and what is going to be the future of the human being in this case.

Index Terms — Nanotechnology, Biotechnology, Information technology

3D MRI Classification using KNN and Deep Neural Network for Alzheimer's Disease diagnosis

El Mehdi Benyoussef[1], Abdeltif Elbyed[1] and Hind El Hadiri[2]
[1]LIMSAD Laboratory, Faculty of Science, Hassan II University, Casablanca, Morocco
[2]Geriatric Services, Emile Roux Hospital, Paris, France
elmehdibenyoussef@gmail.com, a.elbyed@fsac.ac.ma, hind.elhadiri@aphp.fr

Abstract—Alzheimer's disease (AD) is known as one of the most common neurodegenerative diseases which causes permanent damage to the brain cells related to memory and thinking skills. Research in this field aims to identify the most specific structures directly related to the changes in AD. MRI is one of the main imaging modalities which plays a huge role in AD diagnosis. Images produced in MRI helps us get information on anatomical structures in the brain and can also be used for clinical diagnosis of AD stages. In the recent years, deep learning has gained huge fame in solving complex problems from lots of fields, medical image analysis is one of them. This work proposes a K Nearest Neighbor and a Deep Neural Network combined model for the early diagnosis of Alzheimer's disease and its stages using 3D magnetic resonance imaging (MRI) scans.

Index Terms — Magnetic resonance imaging, Machine learning, Brain, Data modeling, Alzheimer's disease, Image classification, Neural networks.

Task-Specific Surgical Skill Assessment With Neural Networks

Malik Benmansour, Wahida Handouzi and Abed Malti
AutoMed (LAT) Tlemcen University Tlemcen, Algeria
benmansour1994@gmail.com , wahida.handouzi@gmail.com, abed.malti@gmail.com

Abstract—Many studies on surgical skill analysis have reported results on classification of different skills. However, regardless of the classification problem, only few of them have addressed the problem of task evaluation. In this paper, we propose a simple and computationally light weight neural network to provide evaluation scores on a given surgery task. The used neural network has three hidden layers and one output node. The output is trained so that it fits average scores of performances on a single known surgery task. Three levels of performance are used: expert, intermediate and novice. We evaluate the performance of the proposed approach on three different surgical gestures: knot tying, needle passing and suturing. To each surgery gesture, we associate one instantiation of the designed network which is trained with the corresponding data. We show that this method gives evaluation scores that are more plausible than a single network which is requested to provide evaluation scores for different tasks.

Index Terms — skill assessment, deep learning

Development of a new diagnostic tool in the field of endoscopy and telemedicine applications

Yassine Baskoun[1], Salah Dine Qanadli[2], Moha Arouch[2], Mohamed Taouzari[3], Mustafa Elalami[1] and Aziz Hraiba[1]
[1]Lab. IMMII, FST, Hassan 1st University, Settat, Morocco
[2]Cardio-Thoracic and Vascular Unit, Depart. of Radiology, Univ. Hospital of Lausanne, Lausanne, Switzerland
[3]Laboratory LISA, Superior School of technology Berrchid, Hassan 1st University, Settat, Morocco
y.baskoun@uhp.ac.ma

Abstract—The use of smartphone in healthcare field is increasing, in particular within the field of endoscopy that usually involves expensive and often cumbersome equipment. The objective is to offer a novel adapter connected to the smartphone with modern endoscopes, exploiting the camera for viewing and recording. The design and operation are described in this article. The adapter demonstrated feasibility of coupling endoscopes to a smartphone. It makes endoscopy easier and unrelated to location and time.

Index Terms — Smartphone, endoscopy, telemedicine, adapter

Smart Emergency Alert System using Internet of Things and Linked Open Data for Chronic Disease Patients

Hajar Khallouki[1], Mohamed Bahaj[1] and Philippe Roose[2]
[1]Mathematics and computer science department, Hassan I Univ., FST, Settat, Morocco
[2]LIUPPA – T2I, 2 Allée du Parc Montaury, 64600 Anglet, France
Hajar.khallouki@gmail.com

Abstract—Nowadays, the widespread deployment of more powerful devices (sensors, smartphones, tablets, etc.) has provided us with great number sources of sensing data that are exploited in several domains namely the healthcare domain. Chronic diseases are the most common causes of death and disability worldwide. These types of diseases require more and more studies to help patients and notify cases of crises that lead to death. Representing knowledge through building an ontology for emergency alert system is important to achieve semantic interoperability among health information, predict the patient real-time context and to better execute decision notification. Linked Open Data services are used in our paper in order to provide with the semantic description of collected data from different sources (wearable sensors, environmental sensors, etc.).

Index Terms — devices, sensing data, chronic diseases, ontology, emergency alert, real-time context, Linked Open Data.

Personalized Healthcare System based on Ontologies

Chaymae Benfares[1], Younes El Bouzekri El Idrissi[2] and Karim Hamid[3]
[1]Dept. of Systems Engineering Lab., ENSA, Ibn Tofail Univ., Kenitra, Morocco
[2]Clinical psychologist, Center for Oncology and Hematology, Univ. Hospital Center Mohammed VI, Marrakech, Morocco
benfaress.chaimae@gmail.com , y.elbouzekri@gmail.com , hk.psychologue@gmail.com

Abstract— Depression and anxiety disorders are common mental health issues that affect our ability to work and our productivity. In this paper, we propose an architecture of a surveillance system, that provides personalized and intelligent services to medical teams that monitor the psychic state of the patient, in the field of mental health, using knowledge of health services and an interactive context of patients between doctors and mental health professionals, we base on an automatic and homogeneous evaluation of the patient's needs in terms of prevention and detection of depressive tendencies. We use ontologies and recommender systems to provide patients with a climate of well-being and ubiquitous follow-up. Our case study is the prevention and screening of depression and anxiety disorders in cancer patients, the unit of psychology, at the center of ontology and hematology of the University Hospital Center "CHU" of Marrakech.

Index Terms — healthcare, ontology, service, personalization, depression, recommender systems

Survey on the use of Health Information Systems in Morocco: current situation, obstacles and proposed solutions

Houssam Benbrahim, Hanaâ Hachimi and Aouatif Amine
BOSS-Team, Systems Engineering Laboratory, National School of Applied Sciences, Ibn Tofail University, Kenitra, Morocco
houssam.benbrahim@uit.ac.ma , hanaa.hachimi@univ-ibntofail.ac.ma , amine_aouatif@univ-ibntofail.ac.ma

Abstract— In order to evaluate the use of Health Information Systems in Morocco, we have contributed an online survey of 199 participants. This survey was based on 27 questions that allow to provide the necessary information about this subject. The results of this study showed that 52.8% of the participants consider that the health services in Morocco are mediocre, 88.4% do not use an Electronic Health Record and 85.9% want to follow their medical situation using Information Systems. Thus, it was found that the majority of the participants think that the Information Systems help to improve the quality of health services, and they have a good knowledge of a new computer technology like Big Data with a percentage of 61.6%. Also, 83.9% of the contributors are agree with the implementation of a new Health Information System that facilitates the management, control and analysis of health data in Morocco. Concerning the obstacles, we have noticed that the most of participants link the barriers to the lack of the laws and the norms in the first degree, and to the lack of funding in the second degree. Finally, we noticed that about half of the contributors are convinced that the health sector in Morocco will be developed in the next 10 years. We have elaborated this study, first to discover the current situation of the Health Information Systems in Morocco, and to know the different obstacles that are related to this topic. Our second objective is to make available a series of possible solutions to improve the health sector in Morocco, some of these solutions only need the application of laws and standards, and some others need the implementation of systems based on an advanced technology like big data.

Index Terms — survey, health information systems, Morocco, electronic health record, big data

Smart System for Monitoring Apnea Episodes in Domestic Environments with Sound Sensor

Javier Rocher[1], Lorena Parra[1], Sandra Sendra[1,2] and Jaime Lloret[1]
[1]Instituto de Investigación para la Gestión Integrada de zonas Costeras., Universitat Politècnica de València. Valencia, Spain
[2]Dep. de teoría de la señal, telemática y comunicaciones, ETS Ingenierías Informática y de Telecomunicación, Universidad de Granada. Granada, Spain
jarocmo@doctor.upv.es , loparbo@doctor.upv.es , ssendra@ugr.es , jlloret@dcom.upv.es

Abstract— The Obstructive Sleep Apnea (OSA) is a disorder that causes frequent pauses in breathing during sleep. This disorder can cause early death, hypertension, etc. Approximately the 4% of the population suffers this disorder. In order to diagnose, it is required a polysomnography (PSG) which s is an expensive test and requires the patient's hospitalization for at least one night This paper presents a system able to detect the OSA during sleep. Our system consists of a sound sensor, a vibrating element and a microcontroller to process the collected data. The sound sensor is placed in the pillow and includes a vibrating element that wakes the user when the OSA event is too long. The sensor and actuator are connected to a microcontroller which includes an IEEE 802.11 interface to be connected to an Access Point (AP). The collected values are processed and sent to a database. The system works analyzing the sound of snoring. Our system can difference 5 different types of snoring: I) no snoring, II) movement III) normal snoring, IV) snoring before OSA, and V) OSA. After that, the values of OSA events are checked by the doctor to take, if needed, the appropriate actions. The results show that we can differentiate the different snoring types thanks to the sound level and the distribution curve. Finally, the system has been verified with a patient with OSA diagnosis and our results coincide with the type of diagnosis and type of snoring that the patient received in his medical report.

Index Terms — obstructive Sleep Apnea (OSA, Apnoea, Wireless Sensor Network (WSN), Snore, E-health

Adverse Drug Reaction Mentions Extraction from Drug Labels: An Experimental Study

Ed-Drissiya El-Allaly, Mourad Sarrouti, Noureddine En-Nahnahi and Said Ouatik El Alaoui
Laboratory of Informatics and Modeling, Faculty of Sciences Dhar El Mahraz, Sidi Mohammed Ben Abdellah University, Fez, Morocco
{eddrissiya.elallaly, mourad.sarrouti, noureddine.en-nahnahi, said.ouatikelalaoui}@usmba.ac.ma

Abstract— Adverse Drug Reactions (ADRs), unintended and sometimes dangerous effects that a drug may have, are a serious health problem and a leading cause of death. Therefore, it is of vital importance to identify ADRs properly and in a timely manner from drug labels. In this paper, we explore both machine learning and deep learning approaches in extracting adverse reaction mentions and modifier terms such as negation, severity, and drug class from drug labels. We investigated Conditional Random Fields (CRF) as a machine learning method, and both Recurrent Neural Network (RNN) and Bidirectional Recurrent Neural Network (Bi-RNN) as deep learning methods. These methods are widely used in biomedical named entity recognition. Experimental evaluations performed on the publicly available datasets SPL-ADR-200db, provided by the TAC 2017 ADRs challenge, show that Bi-RNN achieves good performances compared with RNN and CRF. Bi-RNN outperforms RNN and CRF by an average of 4% and 4.7% in terms of F1-score, respectively.

Index Terms — Adverse Drug Reaction, Recurrent Neural Network, Bidirectional Recurrent Neural Network, Conditional random fields, Biomedical Named Entity Recognition, Natural Language Processing

Lean in Information Technology: produce the human before the software

Soukayna Belkadi, Ilias Cherti and Mohamed Bahaj
Department of Math and Computer Science,Faculty of Sciences & Technology,
Hassan 1st University, Settat, Morocco
soukayna.belkadi@gmail.com, iliascherti10@gmail.com, mohamedbahaj@gmail.com

Abstract— Governments and private companies are under increasing pressure to improve their efficiency in delivering more and better services to citizens. Faced with the new industrial context characterized by the opening of markets, the liberalization of trade and the emergence of information technologies(IT); this companies are forced to be more flexible to survive. As a result, IT activities are becoming increasingly important in the operation of government business. Actually, the Information systems have become more complex, especially with the introduction of software packages based on fully technical platforms, this complexity and duplication of business information can lead to additional costs in terms of development and maintenance. In this context that the combination between the management of information system and lean principles namely in piloting software development projects could bring more and more fruitful results and will seeks incremental waste reduction and value enhancement. We will try in this paper to show how Lean, from the world of manufacturing, applies to the field of information systems security can improve the performance and the security of the information system. This paper will be broken into four sections: section 1 discuss the evolution of lean from the world of manufacturing to the IT functions, the second section discuss the history and the challenges of the information system, the section II presents the IT governance tools and the limits of their application and the last section recommends a methodology to improve the IT maturity of an organization by discussing how Lean can drive the success of IT environments of organizations. It ends by presenting the challenges of the application of lean thinking to the IT functions.

Index Terms — Lean thinking; information system; IT governance, management of information system (MIS)

The barriers to Lean implementation in this new industrial context

Soukayna Belkadi, Ilias Cherti and Mohamed Bahaj
Department of Math and Computer Science,Faculty of Sciences & Technology,
Hassan 1st University, Settat, Morocco
soukayna.belkadi@gmail.com, iliascherti10@gmail.com, mohamedbahaj@gmail.com

Abstract— This paper focuses on Lean's evolution, through a comparison between lean practices since its appearance at Toyota until today in new industrial context characterized by new scientific and technological challenges. We will specially focus on identifying the barriers that can hinder the application of lean in company, in this new industrial context framed by globalization, increased competition between support structures, technological progress, the emergence of information system and new customer that is becoming increasingly demanding. We will therefore propose solutions that can help companies to overcome the obstacles that hinder the application of lean. Through five case studies that will allow us to collect a multi-stakeholder perception of barriers to lean.

Index Terms — Lean thinking, internal factors, external factors, information system.

Early childhood education: How Play Can Be Used To Meet Children's Individual Needs

Rachid Lamrani, El Hassan Abdelwahed, Souad Chraibi, Sara Qassimi and Meriem Hafidi
Computer Systems Engineering Laboratory, University of Cadi Ayyad, Faculty of Sciences Semlalia Marrakech FSSM
soukayna.belkadi@gmail.com, iliascherti10@gmail.com, mohamedbahaj@gmail.com

Abstract— Education provides useful social life skills in order to prepare future proficient leaders. In this regard, a pedagogical scenario is needed to maximize children's learning in terms of apprehending the knowledge, improving their attitudes, etc. Wherefore, why we don't benefit from the natural way of learning? Playing, represent a natural and privileged mode for children expression. It is an integral part of their daily lives, which allows them to experiment and acquire new social, cognitive, and emotional skills. Accordingly, several research, analysis, and reflections have been conducted to provide a play-based learning mode, such as Montessori pedagogical method. Correspondingly, our study proposes some finality games (serious games) in order to enhance and promote a playfully and creative learning. Therefore, we carried out a qualitative systematic analysis and synthesis of the existing literature concerning learning through playing. This paper underlines the contribution of serious games as a learning tool. Based on the Pedagogical Method, a set of sheets have been proposed to represent the serious games ideas and their functioning. We have implemented some serious games scenarios to evaluate our proposal. Future works will focus on testing the developed pedagogical applications aiming for better results and feedbacks.

Index Terms — Preschool learning; Serious games; Gamification; Montessori; The Play Power; Early childhood education

The Right Pricing between the Econometric Model "Generalized Linear Model" and the era of Data Science: Application on the Basic Health Insurance in Morocco

Lamsaddak Karima, Mentagui Driss
Ibn Tofail University: Faculty Of Sciences, Kenitra Morocco
Lamsaddak.karima6@gmail.com

Abstract— The digital revolution, the availability and the immediacy of information are the key factors that define today's consumer. A demanding consumer who can easily judge value for money. As a result, the insurer is obliged to offer the correct rate for these insurance products. For this reason, the aim of this article is to give a basic pricing for the cover of the "disease" risk by the application of the generalized linear model and the proposal of an alternative pricing based on the Data Science.

Index Terms — Health insurance, pricing, generalized linear models,Data Science

Epidemiology of the Mental Retardation in Morocco

Yousra Benmakhlouf, Naima Ghailani Nourouti, Amina Barakat and Mohcine Bennani Mechita
Team in Biomedical Genomics and Oncogenetic, FST- ABDELMALEK ESSAADI University, Tangier, Morocco
Yousra.bmk@gmail.com

Abstract—Mental retardation is a major problem of public health and it is particularly heterogeneous etiologically. Its causes are very diverse and poorly identified.

Objectives: Our present work consists to determinate epidemiological characteristics, prevalence, prevention, and factors involved in mental retardation in Moroccan patients of the city of Fez and their regions.

Index Terms — Epidemiology, Morocco, mental retardation, intellectual deficiency, consanguinity

Deep Learning Algorithm for Suicide Sentiment Prediction

Samir Boukil[1], Loubna Cherrat[1], Fatiha El Adnani[1], Abd Elmajid El Moutaouakki[1] and Mostafa Ezziyyani[2]
[1]Laboratory (LAROSERI), FS, Chouaib Doukkali Univ.El Jadida, Morocco
[2]FST, Abdelmalek Essaadi University,, Tangier, Morocco
boukilsamir@yahoo.fr, ftheladnani@gmail.com, cherratloubna2@gmail.com, elmsn@hotmail.com, ezziyyani@gmail.com

Abstract— The increasing use of social media provides unprecedented access to the behaviors, thoughts, feelings and intentions of individuals. We are interested here in the detection of online notes that express bad feelings that might lead to committing suicide. Our goal is to present an automated detection and prediction system capable of recognizing severe depression, shock, frustration or generally in danger people through analyzing their sentiments and feelings while expressing themselves on social networks, blogs, emails and even textual notes. In this work, we have set up a chain of treatments to extract characteristics from the notes reflecting the emotional state, we can summarize these treatments in two phases: a pretreatment phase based on the Arabic stemming algorithms, and a phase of construction of feature vectors specific to each word of the corpus based on Term Frequency-Inverse Document Frequency method. Then, we applied a model based on Convolutional Neural Networks to predict the nature of feelings behind the notes. The Convolutional Neural Network algorithm is one of many famous algorithms of deep learning field. It is originally created for image processing applications. But recently, it is more and more used in text mining and sentiment analysis field. The originality of the approach is, in one hand, to take into account both the nature of the words that individuals used to express themselves and the extracted statistics from each message or note. And in the other hand, to use the advantages of the Convolutional Neural Network, especially, the convolutional layers, to automatically extract the most significant and reliable features. A preliminary experiment allowed us to evaluate our approach on real cases of online suicidal notes. This type of approach helps to better understand the links between expressions in social media and suicidal ideation.

Index Terms — suicide; depression; classification; sentiment analysis; deep learning; Convolutional Neural Networks; Term Frequency-Inverse Document Frequency

The role of recommender system of tags in clinical decision support

Sara Qassimi, El Hassan Abdelwahed, Meriem Hafidi and Rachid Lamrani
Cadi Ayyad University, Laboratory ISI, Morocco
sara.qassimi@ced.uca.ma, abdelwahed@uca.ac.ma, meriem.hafidi@ced.uca.ma, rachid.lamrani@ced.uca.ma

Abstract— The widespread use of Electronic Health Records EHRs has increasingly emerged in the healthcare industry. The structured and unstructured forms of EHRs are implemented in a clinical decision support system CDSS. The CDSSs are health information technology systems designed to provide healthcare professionals with clinical decision support impacting their clinician decision making about individual patients. In this article, we aim to enhance the computer-aided diagnosis in medical imaging by recommending diseases for each patient's medical image. We propose a recommender system of tags based on the tags co-occurrence, the graph of tags and the graph of the community of patients. The proposed approach is called MedicalRecomTags. The tags are the commonly used diseases or pathologies terms. The graphs, namely, the graph of tags and the graph of the community of patients, are derived by analyzing the annotated medical images. The experimental results show the effectiveness of the tag recommendation approach. In future works, the suggested tags will be evaluated by healthcare providers to attest their relevancy. The intended online evaluation will enrich and enhance the recommender system of tags.

Index Terms — Recommender system of tags; Graph-based tag recommendation; Electronic health record; Clinical images; Clinical decision support

Analytical Apprroach for virtual Classification of e-Health Interventions and Medical Dada sources integration

Mostafa Ezziyyani[1] and Cherrat Loubna[2]
[1]FST, Abdelmalek Essaadi University, Tangier, Morocco
[2]Laboratory (LAROSERI), FS, Chouaib Doukkali Univ. El Jadida, Morocco
ezziyyani@gmail.com, cherratloubna2@gmail.com

Abstract— This paper aims to helps, facilitate, and improve the efficiency of care, and allows real-time monitoring of patients. In fact, it allows collecting and archiving of heterogeneous medical data in a centralized, virtual and secure source. The main aim of the paper is to improve the efficiency and the quality of care and improve patients' lives through optimal information sharing between doctors and professionals. It also contributes to ensure the continuous monitoring of patients. This innovation in this field of e-health can solve, with a perfect cost control, the challenges related to the health care system. In the second hand this work aims to establish an interactive component at the application layer of the system as "Serious Game" for patients, physicians, professionals, and students in medicine. For physicians and students, the device acts as an interactive guide that simulates a medical consultation and can implement all stages of diagnosis, including information gathering, simultaneous notes taking, and physical examination with instruments, so that a doctor would be able to perform a complete assessment of the health state of the patient. Moreover, our solution allows physicians and/or professionals to simulate a whole collaborative training in an educational online game, capable of improving the quality and safety of medical practices. As an example, the solution allows to train professionals in the operating room to avoid all risks before performing a complex surgery. For patients, this component offers schematic solutions that are well-adapted to their conditions. Patients learn techniques of cognitive behavioral therapy to address symptoms of depression and become well-assisted in their rehabilitation. For instance, patients would be able to deal with negative thinking, solve problems, better plan their activities, and learn how to relax. Our solutions will be applied to two basic application fields monitoring systems to be applied in some more application fields.

Index Terms — Big Data, Data Analytics, Data-mining, Data integration, E-health

MRI Images Segmentation for Alzheimer Detection using Multi-Agent Systems

Kenza Arbai[1] and Hanane Allioui[2]
[1]Lab. of Genetics, Neuroendocrinology and Biotechnology, FS, Ibn Tofail Univ., Kenitra, Morocco
[2]Computer science Depart., FS Semlalia, Cadi Ayyad Univ., Marrakech, Morocco.
Kenza.Arad@gmail.com, hananeallioui@gmail.com

Abstract— Neurodegenerative diseases such as Alzheimer's disease(AD), present increasing challenges. Determining the sequence and evolution of the symptoms and pathologies of AD will enable pre-symptom differential diagnosis, and treatment monitoring. Current diagnosis of Alzheimer is made by clinical, neuropsychological, and neuroimaging assessments. In fact, Magnetic Resonance Imaging (MRI) can be considered as the best neuroimaging examination for AD due to the well-defined measurement of brain structures, especially the size of the hippocampus and related regions. Image processing techniques has been used for processing the (MRI) image. Multi-agent Systems (MAS) is a strong paradigm full of complexity that offers promoters solution. We present a MAS solution that aims to automate the search and optimization of image processing. In this survey we propose a three-dimensional (3D) segmentation process based on cooperative MAS.

Index Terms — Alzheimer; Neurodegenerative diseases; Multi-Agent System; Cooperation; 3D Image analysis; Segmentation

predicting breast cancer using data mining techniques and association rules algorithms

Intissar El Kaddaoui, Mostafa Ezziyyani
FST, Abdelmalek Essaadi University, Tangier, Morocco
intissar.elkaddaoui@gmail.com, ezziyyani@gmail.com

Abstract— Breast cancer is deemed currently to be the number one kind of cancer afflicting women worldwide. The number of its patients has been on the increase for the last 20 years. Despite a considerable progress in the management and treatment of this disease, the therapeutic results remain relatively modest. It follows from this that breast cancer proves to be the leading cause of death, affecting women's life span as a matter of course. At the national level, breast cancer is one of the major public health problems. This is because there is a lack of screening as well as the problem of late diagnosis of the patients. Therefore, the identification of genetic and environmental factors is very important in the development of new methods for breast cancer prevention. Thus, it would be very interesting to establish a link between the frequencies of this fatal disease and the patient's data. In this article, a comparison between the various types of algorithms will be drawn with the view to extract the association rules from databases, mainly between the three association rules extraction algorithms: Apriori, close and KDCI. This comparison would allow us to define the most effective algorithm for both the prevention and the surveillance of patients suffering from this fatal disease. The increase of the incidences of breast cancer over the years would be highlighted in due course. Given that a comprehensive national database is not available, I will rely on the data presented on the population register in Casablanca. In short, the data provided by this register show that the incidence of breast cancer in Morocco is noticeably higher than in any other Maghreb countries; yet, it remains well below the incidences found in Western countries

Index Terms — Breast cancer, data mining algorithm, association rules, population register

Modeling the spatial distribution of rainfall in the Tangier area (northen Morocco)

Imane Boulahfa[1], Khadija Aboumaria[1], Rachid El Halimi[1], Abdeladim Batmi[2] and Mustapha Maatouk[1], and Abattouy Mohammed[1]
[1]University Abdelmalik Essaadi, Faculty of Sciences and Techniques of Tangier, Tangier, Morocco
[2]Meteorological center of Tangier airport, Tangier, Moroco
Imano.boulahfa@gmail.com

Abstract— Climate change has become a subject of several studies for our country, especially the far north west of Morocco. The main aims of this work is interpolate the rainfall fields in the Tangier region taking into account the effect of the relief, based on the numerical Terrain model (DEM). To achieve these goals, we propose using the method AURELHY (Analysis Using Relief for the Needs of Hydrometeorology), which allows, from the values of point precipitation their extrapolation to the points not measured Based on Geostatistics. The AURELHY interpolation technique has the advantage of taking into consideration the topography of the region considered according to several stages. The first of these was an integrated approach consists of the coding of the topography surrounding each rainfall station using the Python 3.4 commercial code. The various altitudes are therefore shall be subject by analysis principal components, (ACP) via the R software. In order to identify the dominant trends of slopes for different own vectors. The residues resulting from multiple linear regressions between own vectors, longitude, altitude and distance from the sea allowed us to make interpolation maps by Kriging of these residues. These intermediate maps were finally used to reconstruct the precipitation fields.

Index Terms — climate change; rainfall field; interpolation map; precipitation

Comparison of the relevance and the performance, of filling gaps methods in climate datasets

Jada El Kasri, Abdelaziz Lahmili, Latifa Ouadif and Lahcen Bahi
Lab. of Applied Geophysics, Geotechnics and Geology of Engineering and Environment, Mohammadia School of Engineers, Mohammed V Univ., Rabat, Morocco

Abstract— Missing values in the datasets is an old and common problem in most scientific researches and different fields. That might arise from various sources depending on the domain. Little and Rubin in 2002, defined missing data based on three mechanisms of disparity which are missing at random data MAR, missing completely at random data MCAR, and missing not at random data MNAR. In the area of climate science, missing values in datasets of climatic variables are frequently encountered; they are due mostly to a failure of measuring instruments of the observatory, a recurring breakdown of communication line, or because of the absence of the observer. According to Schneider, rainfall data are included in missing at random assumption, because the gap that occurs in precipitation series does not depend absolutely on the precipitation itself but may depend on other variables. The purpose of this study is to compare three methods of filling missing data that are; simple arithmetic averaging (AA), inverse distance interpolation (ID) and the multiple imputation (MI). The comparison of these three methods was carried out on a list of the annual precipitations concerning one hydrological station localized in the basin of Souss, and based on three evaluation criteria which are; root mean square error (RMSE), mean absolute errors (MAE) and coefficient of efficiency (CE). This analysis will be performed using SAS / STAT statistical, IBM SPSS and Excel software.

Index Terms — rainfall, climate, Multiple Imputation, missing at random MARS, SAS / STAT, IBM SPSS, Souss basin

Hydrogeological and Hydrochemical Study of Underground Waters of the Tablecloth in the vicinity of the controlled city dump Mohammedia (Morocco)

Jamal Mabrouki[1], Souad El Hajjaji[1], Moufti Ahmed[2], Iman Bencheikh[1] and Karima Azoulay[1]
[1]Lab. CERNE2D, FS, Mohammed V University, Rabat, Morocco
[2]Lab. LS3M, FPK, University Hassan 1st, Khouribga, Morocco
jamalmabrouki@gmail.com, hajjajisouad@yahoo.fr, amoufti@gmail.com

Abstract— The changes in the wetlands are very dynamic and they have been evaluated from different data using several techniques (comparison of historical maps, comparison of topographic maps, photo-interpretation ...). The BeniYakhlef plain is highly threatened by water pollution related to chemicals, wastewater, solid waste discharges and intensive use of fertilizers. It is useful to monitor the quality of water resources. This monitoring needs the realization of the vulnerability map to groundwater pollution while relying on digital terrain model data and exogenous data such as: geological, climatic, soil and data on aquifers. Using the hydrological balance equation and Geographical Information Systems (GIS), map of the volumes run-off and infiltrated into the watersheds of the BeniYakhlef plain and the estimation of the impact of urban sprawl on water from the study area were done. The objective of this work is to evaluate the influence of the flow on the physicochemical quality the study site's well's water and to determine the shape of the water table near the water discharge. The results of measurements of the electrical conductivity of groundwater and those of physicochemical analyzes made it possible to define different hydrogeochemical domains. The waters are all on facies mineralized in calcium and magnesium bicarbonates in general. The groundwater flow direction of the water table is plio-quaternary from SW to NE.

Index Terms — Groundwater, Hydrodynamisme, Hydrochimical, discharge controlled Mohammedia, GIS, hydrogeology.

The contribution of remote sensing and Geographic Information System (GIS) in the management of water resources in the Mediterranean West zone Morocco

Amal Sbai and Mohammed Karim Benhachmi
Faculty of Science and Technology, Mohammedia, Morocco
Amalsbai95@gmail.com, benhachmikarim@gmail.com

Abstract— Morocco has implemented a water resources management policy that has allowed the Kingdom to mobilize the conventional, surface and underground resources relatively efficiently. In addition, the control of water is vital because the climatic and hydrological context is extremely fragile. The main purpose of this study is to evaluate the contribution of remote sensing and Geographic Information System (GIS) in the management of water resources in the West Mediterranean area. To achieve this goal, the methodological approach adopted is summarized as follows: the design of the maps (Land cover map, map of the different systems, map of water requirements ...), collection of a geodatabase relating to the spatial distribution temporal pattern of rainfall and temperature at the geographical boundaries of the Mediterranean West Coastal Watershed. These data will be geoprocessed, this can be considered an addition for interpretation and making decision.

Index Terms —GIS, remote sensing, management, water

The management of waste collection in Casablanca

Samiya Sabir

Abstract— Over the past decades, the issue of waste management has become one of the major challenges facing our societies. With ever greater and more diversified consumption, the production of waste continues to increase in quantity and quality, thus creating several health and environmental risks. This situation is much more worrying in developing countries because of their lack of resources and their difficulty in approaching the issue with an approach adapted to their context. The major treatment modalities are identified (recycling, burial, incineration, composting ...) with different solutions and techniques. Part of the challenge of managing waste is the combination of a set of economic, technical, social or environmental criteria, most of which are sensitive to the political and cultural contexts of place and time. This partly explains the diversity of solutions adopted in different countries. Morocco is facing a steady increase in the volume of waste produced. The latter is due not only to the steady growth in the number of inhabitants, but also to the change in production and consumption patterns, and at the same time to the improvement of the standard of living. These are various types of waste: domestic, non-hazardous industrial, specific, green waste, hospital waste, building, cleaning services, etc. The increasing production of waste in Morocco has led to the multiplication of large wild dumps everywhere, around large cities (more than 300 wild dumps), not counting those which are born and grow of themselves in the land, at the same time. interior of the cities, by force of waste accumulated and neglected. The negative impact of this situation on natural resources, public health and local government budgets has been highlighted.

Index Terms —Waste reduction, decebrications, pneumatic collection, scouring, sweeping waste

Elaboration of Two Ecological Eoods of Trout Rainbow (ONCHORYNCHYS MYKISS WALBAUM, 1792) by Extrusion System

K. Ouaissa[1, 2], A. Kritih[1, 2], Y. Oumessoud[2], A. Maychal[2], and M. Hasnaoui[1]
[1]Department of Biology, FST, Beni-Mellal. Univ. Sultan Moulay Slimane, Beni-Mellal, Morocco
[2]Fish Farming AinAghbal, Azrou–Morocco
khadijaouaissa89@gmail.com

Abstract— Two types foods of rainbow trout extruded (F1 and F2) have been formulated and prepared using a variety of animal and plant-derived raw materials. The first food (F1) was formulated with fish meal as the main source of protein, the second food (F2) with a high percentage of corn gluten. The two formulas developed for rainbow trout give significant growth for a short period in 45-days, better zootechnical performances and low fish releases neglected. The negative impact of this situation on natural resources, public health and local government budgets has been highlighted

Index Terms —Extruded, food, rainbow trout ,formulas, zootechnical performances.

Bacterial inspection of flavobacterium genus in brook trout (Salvelinus fontinalis) with skin lesions in Morocco

Assia Kritihi[1,2], Khadija Ouaissa[1,2], Abdelaziz Maychal[2], Youness Oumessaoud[2] and Mustapha Hasnaoui[1]
[1]Faculty of Sciences and Techniques, Sultan Moulay Slimane Univ. Beni Mellal, Morocco
[2]Ain Aghbal fish farm. Azrou, Morocco
assiakritihi@gmail.com

Abstract— Flavobacterial diseases negatively impact wild and cultured fishes worldwide. We recently reported on the presence of a large and diverse group of flavobacteria, many of which were associated with lesions in a salmonid farm in Morocco. Herein, we report the characterization of 6 strains to be as Flavobacterium spp associated to brook trout raised at the fish farm. The aim of our study was to investigate the presence of Flavobactrium genus bacteria in infected and non-infected brook trout fishes, in spring. We isolated bacteria from infected and non-infected fish and we could identified some of them as bacteria belonging to flavobacterium genus

Index Terms —flavobacterium; brook trout; lesions; salmonid hatchery; Morocco.

Towards SDI services for geological maps data

Tarik Chafiq[1], Hassane Jarar Oulidi[2], Ahmed Fikri[1] and Abdenbi Elaloui[1]
[1]Laboratory of applied geology, Geomatics and Environment, Faculty of Sciences Ben M'Sik, University Hassan II, Casablanca, Morocco
[2]Hassania School of Public Works, Casablanca, Morocco

Abstract— The aim of this work is to facilitate access to geological data coming from distributed data sources and the information (metadata) related to these data. For that purpose, a spatial data infrastructure (SDI) prototype has been established which comprises a geoportal that provides access to a geological Catalogue through Catalogue Service for the Web (CSW) in order to get the metadata that describes the data as well as the available services as the WMS (Web Map Service) view and Web Feature Service (WFS) download services, which aims to be compliant with the Open Geospatial Consortium (OGC) standards rules. Indeed, the establishment of spatial data infrastructure that has been elaborated in accordance with internationally recognized standards allows the exploration and sharing of geological data information and will also allow researchers and professionals to spend more time in the analysis and the discovery of these data. This work can be used as a model for other fields in geoscience such as geophysics and hydrology or other close fields.

Index Terms —OGC Standards; SDI; Metadata; Interoperability; Geology; Morocco

Optimizing the treatement of reconstituted waste water from Acid Red35 Dye by Electrocoagulation in an Internal Loop Airlift reactor using the Experimental Design

Naima Azeroual, Adil Dani, Bouchra Bejjany, Hamid Mellouk and Khalid Digua
Laboratory of Process Engineering and Environment, Faculty of Science and Technology of Mohammedia, Hassan II University of Casablanca, Morocco
naimaazeroual@yahoo.fr

Abstract— The ability of Electrocoagulation (EC) to remove AcidRed35 (AR35) Dye from aqueous solutions is investigated in an internal loop airlift reactor (ILAL Reactor) using the Aluminium anode and taking into account many factors such as electric conductivity, applied voltage, the treatment time and the inter-electrode distance Dint. In order to verify these factors and their effects on the (EC) of (AR35), we have established a model following the Methodology of Plans of Experiments. The mathematical model is established, initially using a full screening plan, to verify the existence of the effect of these four factors, and in a second time, a central composite design (CCD) is applied [1]. The model describes the change in measured responses, of dye removal efficiency (R (%)), and energy consumption (E cons (W h/m3)), according to the three factors (the conductivity, the treatment time and the inter-electrode distance (Dint). The voltage was fixed at 6V because, it has no effect on the removal efficiency of (AR35) during the screening step. The graphical representation of this model, in the variable space, and "desirability function" allowed us to define the optimal conditions for these parameters. The optimum value of the conductivity, the time, and Dint are respectively 1000 µs/m2, 20 min and 1.5 cm. A 53% efficiency of dye removal is observed with an energy consumption of 1859 Wh /m3.

Index Terms —The Acid Red35 dye; Electrocoagulation; Aluminum anode; Internal Loop Airlift reactor; Methodology of Plans of Experiments

Water quality of El Hachef River (Region of Tangier-Tetouan-Al Houceima, North West Morocco)

El Afia Mouna[1], Brahim Damnati[1], Hamid Bounouira[2], Khalid Embarch[2], Hamid Amsil[2], Moussa Bounakhla[2], Mounia Tahri[2] and Ilyas Aarab[2]
[1]Laboratory of Marine Environment and Natural Hazard, FST, Abdelmalek Essaâdi Univ., Tangier, Morocco
[2] Geochemistry and Chemical Pollution Unit (UGPC), National Center for Energy, Sciences and Nuclear Techniques (CNESTEN), El Maâmoura, Morocco
mounaelafia@gmail.com

Abstract— This work is part of a chemical and geochemical study of the surface waters and actual sediments of EL Hachef river in the region of Tangier-Tetouan-Al Houceima (North-West Morocco). The objectives of this work are to determine the physicochemical parameters, major and trace elements concentrations of waters in order to demonstrate the degree of pollution, to study the geochemical quality and to determine the geochemical inheritance in EL Hachef river area. The water samples collected were analyzed by the neutron activation analysis technique. Results obtained show that the contents of the major and trace elements in water are representative of those of the upper continental crust as a whole. This confirms the good quality of water and the importance of the geochemical inheritance of EL Hachef river basin.

Index Terms —EL Hachef river, Water, Major elements, Trace elements, pollution, Quality, Morocco.

A review of solid waste composting process : The perspective for fast composting

Manale Zouitina, Khadija Echarrafi, Mounia El Haji and Ibtissam El Hassani and Safia Lamrani
OSIL Research Team, LRI Lab., ENSEM School, Casablanca, Morocco
m.zouitina@ensem.ac.ma, k.echarrafi@ensem.ac.ma, m.elhaji@ensem.ac.ma,
i.elhassani@ensem.ac.ma, s.lamrani@ensem.ac.ma

Abstract— Composting technology has become invaluable in organic waste valorization. In this review study, the composting process, and the main factors that affect compost maturity were explored. Further to that, various rapid composting techniques in the literature were presented.

Index Terms — composting; organic matter; optimization; maturation

Optimisation algorithms applied to Anaerobic Digestion Process of Olive Mill Wastewater

Khadija Echarrafi, Manale Zouitina, Ibtissam Elhassani and Mounia El Haji
OSIL Research Team, LRI Lab., ENSEM School, Casablanca, Morocco
k.echarrafi@ensem.ac.ma, m.zouitina@ensem.ac.ma, i.elhassani@ensem.ac.ma, m.elhaji@ensem.ac.ma

Abstract— Agriculture has always been a strategic sector for socioeconomic development in Morocco. Indeed, the green Morocco plan aims to extend the area of olive trees and set up new modern crushing plants in order to increase productivity and competitiveness of the olive industry. Olive mill solid waste (OMSW) and olive mill wastewater (OMW) are two types of waste generated by this industry. These wastes are rich in organic matter, but their discharge without pretreatment in nature has a toxic effect on the natural environment (soil, air, and water) because of their high acidity due to their polyphenol content. White Biotechnology, particularly anaerobic digestion (AD), remains an effective way that uses the effluents mentioned above as a raw material for producing a renewable energy such as biogas (CH4). The aim of this work is to present a literature review of anaerobic digestion process, its influencing parameters as well as optimization algorithms used for optimizing the process and predicting gas yield.

Index Terms — OMW; Anaerobic digestion; Optimization algorithms.

Emission inventory in urban road: case study Tangier city

Marwane Benhadou, Nadia Bufardi and Abdelouahid Lyhyaoui
Laboratory of Innovative Technologies, National school of applied sciences, UAE
Tangier, Morocco
mrwbenhaddou@gmail.com, nadiabufardi@gmail.com, lyhyaoui@gmail.com

Abstract— The impact of transport not only affects the environment but also the health of citizens. Every day our lungs filter 15 kilos of air, and if we live in a big city or next to a highway, that air will contain pollutants emitted by vehicles, which indirectly affect our health. Currently more than 50% of the world population live in cities and the main responsible for the loss of air quality are the moving sources, in the interval between 75% and 80% of the total pollution. It will be interesting to quantify this problem by making an environmental inventory to see how urban transport affects air quality. In this paper we develop a methodology to estimate traffic flows and the main goal is to create an inventory emission, in the center of city where most pedestrians and vehicles are concentrated.

Index Terms — Road emission inventory; Urban areas ; Dijkstra algorithm; Wardrop principle; Mobility in Tangier (Morocco)

Exploring Apache Spark Data APIs for Water Big Data Management

Elhassane Nassif and Hicham Hajji
School of Geomatic Sciences and Surveying Engineering, SGIT, IAV Institute
Rabat, Morocco
nassif.hassane@gmail.com, h.hajji@iav.ac.ma

Abstract— Managing data complexity is a recurrent problem in multiple domains related to water resources management such as utilities, hydrological and meteorological modelling. Recently and since the advent of intelligent sensors, we observe a systemic growth in the volume of collected data. Besides, these kinds of sensors generate near real-time data under various formats. To get the right value of this kind of water datasets we need to design new solutions, efficient enough to manage massive data coming from intelligent sensors in near real time and under various formats. We present in our paper a reference architecture for managing massive data collected from smart meters. Also, we show how recent advances in big data technologies mainly the Apache Spark project can effectively be used to obtain insights from massive datasets. Finally, we will focus on presenting the advantages that provide the distributed execution model of Spark by exploring three Apache Spark APIs: RDD, Dataframe, and SparkR.

Index Terms — big data; spark; water management

Urban Parks Spatial Distribution Analysis and Assessment Using GIS and Citizen Survey in Tangier City, Morocco (2015 Situation)

Abdelilah Azyat[1], Naoufal Raissouni[2], Nizar Ben Achhab[1], Asaad Chahboun[1], Mohammed Lahraoua[1], Ikram Elmaghnougi[3], Boutaina Sebbah[3] and Imane Alaoui Ismaili[1]
[1]National Engineering School for Applied Sciences, Univ. Abdelmalek Essaadi, Tangier, Morocco
[2]National Engineering School for Applied Sciences, Univ. Abdelmalek Essaadi, Tetuan, Morocco
[3]FST, Univ. of Abdelmalek Essaadi, Tangier, Morocco
azyat.ensat@gmail.com world.nizar@gmail.com , chahboun_asaad@yahoo.fr , m_lahraoua@yahoo.fr, raissouni.naoufal@gmail.com, ikram_br_19@hotmail.fr, boutainasebbah@gmail.com

Abstract— In the last years, the city of Tangier (northern Morocco) has faced tremendous growth pressure. Actually, it is considered as one of the most densely populated cities with a density of 930 inhabitants per km². This strong demographic pressure has contributed to the increase of urbanization rate up to 60.3% compared to 55.1% nationally. Moreover, the surface of the urban parks in the studied area in Tangier city is around 1.75 km2, representing lower values in comparison with international standards. In general, urban parks in Tangier city are characterized by their limitation in space distribution and their limited area. In the present paper, based on Geographical Information System (GIS) technics, the proximity of four Tangiers' commons; Tanger, Boukhalef, Charf and Benimakada, to urban parks is analyzed. First, the spatial distribution of these urban parks is studied in terms of efficiency level referring to three indices (i.e., Park Area per Capita, PAC, Park Area Ratio, PAR, and Population Ratio, PR). Second, assessment of the population satisfaction and needs is carried out through both face-to-face and online citizen survey questionnaire. Accordingly, a total of 610 returns are collected from citizens of different commons. The outcomes highlight interesting points mainly the insistence and requirement for more urban parks. Finally, results show that public urban parks are not efficiently distributed in relation to residents and urban development. Some populations have access to urban parks, whereas more than half of the inhabitants were found to have limited access because of their dispersed and inconvenient spatial distribution. PAC values corresponding to Tanger, Boukhalef, Charf and Benimakada commons were determined to be 6.08 m2, 2.07 m2, 0.61 m2 and 0.08 m2, respectively. Therefore, Charf and Benimakada commons show to be the most affected commons.

Index Terms — urban parks; GIS; spatial distribution analysis, accessibility, citizen survey

A Cellular Automata Model of Spatio-temporal Distribution of Species

Joao Bioco[1], Joao Silva[1], Paulo Fazendeiro[1] and Fernando Canovas[2]
[1]Instituto de Telecomunicações, Universidade da Beira Interior, Covilhã, Portugal
[2]Centro de Ciências do Mar, Universidade do Algarve, Algarve, Portugal
{joao.bioco, a30152, fazendeiro}@ubi.pt, fcgarcia@ualg.pt

Abstract— Cellular automata (CA) are discrete models frequently used in ecological and epidemiological studies due to the capacity to simulate dynamic systems and analyze their behavior. One of the applications of CA in ecology is in the analysis of the spatial distribution of species, where simulation models are created in order to study the response of ecological systems to different kinds of exogenous or endogenous perturbations. In this study we describe an implementation of a cellular automaton model able to incorporate environmental data collected from different heterogeneous sources. To the user is given the power to produce and analyze different scenarios by combining the available variables at will. Different hypothesis regarding the individual contribution of each environmental variable can be promptly tested. As an illustrative example of the flexibility of our implementation we present a case study where, departing from a generalized additive model (GAM), validated in the literature, a possible explanation is given for the spatiotemporal distribution of two haplotypes of honeybees along Iberian Peninsula. Environmental data were used to describe every 30x30 second unit grid of the study area (World Geodetic System 1984 WGS84, geographical coordinates). The results of our model are compared and discussed at the light of the real data collected on the terrain. In order to evaluate our model, we calculate a set of common performance metrics usually used in species distribution models such as ROC curve, overall accuracy, precision and TSS. Curiously enough, both in the synthesized model and in the real data, one can observe that the frequency of African haplotypes decreases in a SW-NE trend, while that of west European lineage increases.

Index Terms — environmental modeling; cellular automata; modeling tools; species distribution models.

Study Of The Effect Of Evaporation Temperature On The Qualitative And Quantitative Separation Of Marine Mineral Salts: Prediction And Application On The Seawaters Of The Atlantic Sea, Morocco

Fatima Zahra Karmil[1,2], Sara Mountadar[1,2], Mohammed Mountadar[1], Anouar Rich[2] and Mostapha Siniti[2]

[1]Laboratory of Water and Environment, FS, Chouaib Doukkali Univ., El Jadida, Morocco

[2]Team Thermodynamics Surface and Catalysisn, FS, Chouaib Doukkali Univ. El Jadida, Morocco

fatimazahrakarmil@gmail.com

Abstract— This work aims to determine the temperature effect on the separation of sea- salts mineral on the Moroccan Atlantic coast. The main objective of this study is the determination of the optimal conditions of the evaporation process through the prediction of the liquid-solid equilibrium of seawaters at each stage of the evaporation process. Hence, the physicochemical and thermodynamic properties of evaporation were exploited through the calculation codes Frezchem and PhreeqcI3 to quantify the effect of the ionic composition of raw and concentrated seawater on the evaluation of salinity and on the qualitative and quantitative separation of salts. Moreover, the results obtained by the used calculation codes were validated by experiments. The results obtained from simulation modeling for different temperatures (25°C, 50°C, 75°C and 100°C) and different compositions were in good agreement with the experimental results carried out under the determined optimal conditions. In addition, it can be concluded from the results that the saturation and quantitative separation thresholds of each type of salt for different concentrations of marine waters are different and this is mainly due to the variation in the solubility of each salt as a function of the variation in temperature. Concerning the temperature effect, it was observed that the quantity and quality of precipitated marine salts by evaporation of the raw and concentrated waters of the Atlantic Ocean varied with the studied temperatures.

Index Terms — prediction; seawater; analysis; evaporation;sea-salts

Performance of Aspergillus niger and Kluyveromyces marxianus for optimized bioethanol production from dairy waste)

Azzouni Dounia[1], Lahkimi Amal[2], Louaste Bouchra[3], Taleb Mustapha[2], Chaouch Mehdi[1], Eloutassi Noureddine[1]
[1]Process Engineering and Environment Lab., FS Dhar El Mahraz, Sidi Mohamed Ben Abdellah Univ., Fez, Morocco
[2]Engineering, Electrochemistry, Modelling and Environmental Lab., FS Dhar El Mahraz, Sidi Mohamed Ben Abdellah Univ., Fez, Morocco
[3]Biotechnology Lab., FS Dhar El Mahraz, Sidi Mohamed Ben Abdellah Univ., Fez, Morocco
azzouni.dounia@gmail.com

Abstract— generally, biotechnology is used for a cleaner production and an increased energy effectiveness with less greenhouse gases emissions responsibles of serious environmental problems: air and water pollution. Parallel to the increase of generated organic waste, during last decades, the recourse to renewable sources of energy receives considerable interest in the whole world. The energy of biomass is one of the promising sources, which contributes to organic waste valorization: wastewater, agricultural residues and industrial waste that can be used for bio-fuel production. In this study we are interested in dairy waste valorisation as those effluents are characterized by high organic matter content, considerable concentrations of oils and greases, high levels of BOD5, COD, nitrogen and phosphorus, significant variations of the pH and temperature and a high conductivity which largely exceeds those of domestic waste. Thus, our study is devoted to the production of bioenergy from dairy waste by two yeast Strains (Aspergillus niger and Kluyveromyces marxianus) characterized by a great output of ethanol and a strong performance in the depollution of these industrial effluents.

Index Terms — bioenergy; Aspergillus niger; Kluyveromyces marxianus; depollution; bioethanol; dairy waste.

State of the art and perspective of the wetlands in Algeria; Taghit case (Zosfana watershed, South-West Algeria)

Imane Badaoui and Mohamed Tamali
ENERGARID Laboratory for Energetic Studies, dept. hydraulic Faculty of Technology, Univ. "TAHRI Mohamed" Bechar Algeria
emyhydro@gmail.com, mtamali@gmail.com

Abstract— After a short recall of the history on the wetlands in Algeria, the state of the art consists of setting in point on scientific knowledge of this set of themes given. The notion of the wetlands in Algeria started with the convention of Ramsar.In November 1984 at the time of its adhesion with the convention of Ramsar, Algeria had classified its the first two wetlands, the Tonga lakes and Oubeira.In 1999, it registered of it a third site, the lake of the Birds, always in the complex of wetlands of El kala, in the wilaya of Tarf.The still incomplete national inventory, undertaken since 1996 pennies general direction of the drills, by counting 254 significant natural wetlands which appear in an Atlas of the wetlands published in 1999.Among them, an about sixty would deserve to be registered on the list "Ramsar" of the wetlands of international importances this work is followed by a fourth edition in 2004. With the instar with the criteria of Ramsar the valley of Saoura contains Oases which presents being classified like wetland, in this connection, has to re-examine the abstract according to criteria's doors we propose a preliminary study of the area of Boukais like a proposal to classify a wetland, according to a physical study which contains a detail geological, hydrogeologic, hydrological and climatic, and an ecological study reflecting the fauna and the flora of this area it also another zones potentials in the area of Saoura:stopping Djorf Torba, Meridja, Boukais, Moughel, Beni Abess…

Index Terms — The state of the art, Ramsar, wetlands, Oasis of Taghit, Saoura, Algeria

Study of wastewater treatment's scenarios of the Faculty of Sciences- Ain Chock, Casablanca

Proposal I: Vertical flow filter

Nihad Chakri[1], Btissam El Amrani[1], Faouzi Berrada[2] and Fouad Amraoui[2]
[1]Dept. of Chemistry, FS - Aïn Chock, Hassan II University, Casablanca, Morocco
[2]Dept. of Geology, FS - Aïn Chock, Hassan II University, Casablanca, Morocco
n.chakri2009@gmail.com, elamrani.btissam@gmail.com, faouzi_berrada@hotmail.com, amraoui_f@hotmail.com

Abstract— In the context of water stress in our country, alternative solutions for better management of water resources are to be developed. It's in this spirit that our research team initiated a project to design a prototype for the purification of part of the wastewater from the Faculty of Sciences- Ain Chock and to reuse it for the cleaning of the premises, watering green spaces... This prototype is an open-air educational tool for students from different disciplines of our Faculty. Laboratory tests for the three scenarios, proposed in Saidi's thesis, have been carried out to highlight the most suitable process for local conditions, namely: **Scenario I**: settling basin followed by a vertical flow filter. **Scenario II**: settling basin followed by two Moving Bed Biofilm Reactors (MBBR). Scenario III: settling basin followed by two Moving Bed Biofilm Reactors (MBBR) then a vertical flow filter. In this study, only the wastewater treatment with vertical flow filter was addressed. So, after identification and characterization of the liquid discharges, we designed and implemented four purification prototypes: **prototype1**: non-planted pozzolan filter with vertical flow. **prototype2**: pozzolan filter with vertical flow planted (reeds). **prototype3**: non-planted gravel filter with vertical flow prototype4: gravel filter with vertical flow planted (reeds) The four filters are fed by liquid discharges, previously decanted, toilets of the Faculty. The results show that the abatement of the organic pollution parameters, chemical oxygen demand (COD), Biochemical demand in Oxygen (BOD5) and suspension material (TSS), is satisfactory. Indeed, we have obtained, for a sewage settling of 48 hours: **a)** Good removal of suspended solids (TSS) in the settling basin (67%). **b)** A good reduction of the three physicochemical parameters chosen at the exit of the pozzolan filter planted with reeds (>80%). In conclusion, the best results in terms of pollutant abatement were obtained by combining pozzolan and reeds, which is probably due to the combined action of macrophytes, bacteria and the physical barrier constituted by the filter body. Based on the results obtained at laboratory scale, we designed and implemented a prototype of a miniwastewater treatment plant of the Faculty. Construction work is currently underway. This project would allow in-depth experimental studies to define the ideal system for establishing the procedure of optimal selection to filtering material, the type of plants, the length of stay, parameters analyzed...

Index Terms — Wastewater, Purification, Gravel, Pozzolan, Pilot, Reuse, Sustainable development, Planted filter, Reeds.

Industrial Area with "zero waste to landfill"

Waste mapping and deployment of waste management tools

Hasnaa El Harhouri, Manale Zouitina and Khadija Echarrafi
Industrial Engineering, ENSEM, King Hassan II University, Casablanca, Morocco
Hasnaa.elharhouri@gmail.com, Manalezouitina1@gmail.com, Khadijacharrafi@gmail.com

Abstract— The study subject consists on two areas of focus: the first one is a deep-dive field study which consists on mapping the waste flow on the "Sidi Elbernoussi industrial area", and the second one is to use the output of the waste map to design recycling processes appropriated to each type of waste. The first category of waste to work on is Organic waste recycling by composting.

Index Terms — waste mapping;organic waste; style; composting

New tools for the diagnosis, characterization and improvement of the quality of coastal waters of the eastern Mediterranean, Morocco

Imad Krikech[1], Gaël Le Pennec[2] and Mohammed Ezziyyani[1]
[1]Depart. of Life Sciences, Polydisciplinary Faculty of Larache, Abdelmalek Essaâdi Univ. Larache, Morocco
[2]Laboratory of Marine Biotechnology and Chemistry, European Univ. Institute of the Sea, Lorient, Univ. of Bretagne-Sud, France
imad.krikech@gmail.com, gael.le-pennec@univ.ubs.fr, mohammed.ezziyyani@gmail.com

Abstract— Nowadays, the implementation of new tools for monitoring and evaluation of the state of the marine environment and the fight against pollution related to human activity have become global issues. Many biological contaminants and chemical pollutants are found in sea water, therefore in aquaculture products. This context fact sea professional is looking for solutions to preserve or even improve the quality of their waters. Filter-feeding invertebrates are often selected to assess contamination by chemical pollutants and the biological impact of pollution [1-2]. Among these, sponges represent a good biomarker thanks to some of their characteristics: benthic and fixed, abundant and available, perennial in ecosystems due to their long-life span, tolerance to anthropogenic pollutants and, in particular, be capable of strongly accumulating heavy metal pollution [3-4]. Sponge was largely used worldwide tomonitor coastal ecosystems [5]. In Morocco few studies have been carried out on trace metal concentrationin marine spongesand limited almost exclusively to measurements of chemical parameters of water and sediments. In this area of interest, the Mediterranean sponge Petrosia ficiformis will be chosen as a model for our study. The first step of this thesis work was to establish an inventory of biodiversity and distribution of sponges on the Mediterranean coast of the Tangier-Tetouan-Al Hoceima region, in order to select the most interesting species for bioindication. Indeed, it was necessary to ensure that the chosen species is known to accumulate significant levels of pollutants, that it is accessible, naturally present and abundant on the Mediterranean coast of the Region Tangier-Tetouan-Al Hoceima to avoid introduce a non-endemic species, and finally be original from a chemical point of view in a valuation objective. For this, we conducted pilot field studies and sponge prospecting campaigns along the Mediterranean coast of the Tangier-Tetouan-Al Hoceima Region. Five sampling stations were selected between Tangier and Al-Hoceima (Figure 1). The choice of sampling sites was based on the presence of the reference species, the technical feasibility of collecting sponges and their proximity to sources of pollution, such as: fishing activity, urban agglomerations, areas industrial, etc. All samples taken (24 samples) were identified. Species identification has been confirmed by Jean Vacelet, CNRS, (France) and Nicole de Voogd, Researcher, NBC (Netherlands). Samples harvested (24 samples) were identified in 7 species of sponges belonging to 5 different orders, distributed in a non-homogeneous way. The species P. ficiformis has the widest distribution; it is the only one to find in all sampling sites. Due to its omnipresence on the Mediterranean coast of Morocco, its potential to bioaccumulate pollutants such as ETM and organic compounds P. ficiformis is the species we selected.

Index Terms — coastal waters; diagnosis; Organic compound; ETM

Optimization by response surface methodology of Copper-pillared clay catalysts efficiency for the CWPO of 4-Nitrophenol

Fidâ Baragh[1,2], Khalid Draoui[3], Brahim El Bali[2], Mahfoud Agunaou[1] and Abdelhak Kherbeche[2]
[1]Lab. LCCA, Faculty of Sciences, Chouaib Doukkali Univ., El Jadida, Morocco
[2]Laboratory of Catalysis, Materials and Environment (LCME), EST, Sidi Mohamed Ben Abdellah University USMBA, Fez, Morocco
[3]Materials and interfacial systems laboratory (MSI), Faculty of Sciences, Abdel Malek Essaadi University, Tetouan, Morocco
f.baragh@gmail.com

Abstract— The properties of copper-based pillared clays (Cu-PILBen) have been studied and compared with those of Aluminum-based clays (Al-PILBen) in the catalytic wet hydrogen peroxide oxidation (CWPO) of model phenolic compound 4-nitrophenol (4-NP) without pH adjustment. The parameters like temperature (40-60 °C), peroxide dosage (8-12 mM) and initial 4-NP concentration (50–100 mg/L) were optimized using a three-factor Box–Behnken design (BBD) of response surface methodology (RSM). The results of this study showed that more than 90% of 4-NP was experimentally degraded using Cu-PILBen after 4 h of reaction time under optimum conditions of temperature and initial concentrations of H2O2 and 4-NP, which was in a good agreement with the BBD model's prediction of a 97% maximum degradation at 52°C, initial 4-NP concentration of 50 mg/L and peroxide dosage of 10mM.

Index Terms — 4-nitrophenol, pillared clay catalysts, catalytic wet peroxide oxidation, response surface methodology.

Toward a study of environmental impact of the Tanger Med port container terminals

Fatima Ezzahra Sakhi, Abdelmoula Ait Allal, Khalifa Mansouri and Mohammed Qbadou
Labaratory: Signals, Distributed Systems and Artificial Intelligence (SSDIA)
ENSET Mohammedia, University Hassan II, Casablanca, Morocco
sakhi.fatimaezzahra@gmail.com, aitallal.abdelmoula67@gmail.com,
khmansouri@hotmail.com, qbmedn7@gmail.com

Abstract— The containerized cargo segment has continued its improvement during the last decades. This improvement has motivated the maritime stakeholders to invest in container terminal projects to boost their economies and to ensure the prosperity of their countries. However, the container terminal activity has a significant environmental impact on air, ocean, workers, and the surrounding population. The port of Tanger Med as one of the worldwide container terminal hubs does not make the exception in term of environmental impact. In this paper, the environmental impact of this port is quantified in term of greenhouse gases emission and pollutant particles. Innovative operational and technical solutions have been proposed to attenuate this impact and to make of it an environment friendly port.

Index Terms — environment; Port; ship; green energy; rubber fragments; GHG emission

A copulas approach for forecasting the rainfall

Abdelhak Zoglat[1], Amine Amar[2], Fadoua Badaoui[3] and Laila Ait Hassou[1]
[1]FS, Mohammed V Univ. in Rabat, Rabat, Morocco
[2]Moroccan Agency for Sustainable Energy, Rabat, Morocco
[3]National Institute of Statistics and Applied Economics, Rabat, Morocco
sakhi.fatimaezzahra@gmail.com, aitallal.abdelmoula67@gmail.com,
khmansouri@hotmail.com, qbmedn7@gmail.com

Abstract— Rainfall forecasting is a crucial issue in a semi-arid country like Morocco. Information on rainfalls can be used by marketers in the short term, to plan customer allocations and storage requirements. In the middle term, it can provide guidelines for seasonal selection of crops. In the long term, rainfall forecasts are important for hydrologists and water managers to build integrated strategies against potential disasters caused by tremendous floods or severe droughts. Rainfall forecasting methods are of two kinds. The first one relies on statistical approaches while the second one is based on numerical simulations. Despite their higher cost, numerical simulations are still unable to consistently outperform simple statistical prediction systems. This is essentially related to the uncertainty of the relationship between rainfalls, hydro-climatic variables and climatic variability indices. This paper aims to present a statistical approach supporting the use of lagged Southern Oscillation Index (SOI) for forecasting seasonal rainfall. We establish a statistical model, based on copulas theory, which takes the SOI and the rainfall relationship into account. Data are obtained from the World Meteorological Organization (WMO), for 6 meteorological stations located in Morocco (Tangier and Casablanca), Spain (La Coruna and Valladolid), and Portugal (Lisboa-Geofísica and Santa Maria). Using the suggested approach, we conduct a deep temporal and regional comparative analysis, which leads to the adjustment of different families of copulas, but with a predominance of Normal and Clayton copulas. For all stations and seasons, final results confirm a delayed effect in the structure between Rainfall and SOI with a strong relationship on the central part, while rainfall extreme events can be related to other atmospheric and climatologic indces.

Index Terms — Rainfall forecasting, Southern Oscillation Index (SOI), Copulas theory, Quantile regression.

Modeling the flow behavior of phosphate-water slurry through the pipeline and simulating the impact of pipeline operating parameters on the flow

Hamza Belbsir and Khalil El-Hami
Hassan 1st Univ., Faculty of Khouribga, Lab. of Nanosciences and Modeling, Khouribga, Morocco
h.belbsir@uhp.ac.ma, khalil.elhami@uhp.ac.ma

Abstract— In this study, we were interested in the flow of phosphate-water slurry into the pipeline linking the Khouribga mine pole and the Eljorf-Lasfar industrial platform in El Jadida. We carried out a mathematical modeling on the linear head losses, the hydraulic gradient, the friction factor, the roughness of the pipe and the geographic profile followed by the pipeline. The modeling allowed us to know the values of the pressures in all the points of the pipeline according to the operating parameters. The results of the modeling were grouped in a program in Matlab. The agreement of the experimental results with the results of our modeling, pushed us to make simulations through our theoretical model. The simulation focuses on the impact of flow rate, density and viscosity of the slurry and chokes on the behavior of head losses. This study includes the case of continuous pumping in slurry and the batch case.

Index Terms — Modeling; simulation; pipeline; head losses; geographic profile; pressure; density; viscosity; choke

Toward a study of environmental impact of shipping industry and proposal of alternative solutions

Abdelmoula Ait Allal, Khalifa Mansouri, Mohamed Youssfi and Mohammed Qbadou
Lab.: signals, distributed systems and Artificial Intelligence (SSDIA)
ENSET Mohammedia, Univ. Hassan II, Casablanca
aitallal.abdelmoula67@gmail.com , khmansouri@hotmail.com , med@youssfi.net , qbmedn7@gmail.com, h.belbsir@uhp.ac.ma, khalil.elhami@uhp.ac.ma

Abstract—The maritime industry is considered as the main pillar for the worldwide economy trade. It is the propulsion engine for the economy development and prosperity of many countries. This shipping industry encounter many challenges to ensure its competitiveness and its environmental sustainability. However, the ship operation generates many environmental pollutants that harm the air and oceans. It daily produce sludge, bilge water, garbage, sewage and harmful the ecosystem by the ballast water exchange operation. In this paper, we aim at identifying and quantifying these products and to assess their impact on the marine environment. Alternative solutions are proposed to reduce the shipping environmental impact. The concept of autonomous ship is also proposed as an alternative for an environmentally sustainable maritime industry.

Index Terms — shipping industry, ocean pollution, environment, conventional ship, GHG emission

Optimization of Coagulation Flocculation Process for the Removal of Heavy Metals from Real Textile Wastewater

Dalila Sakhi[1], Youness Rakhila[1], Abdellah Elmchaouri[1], Meriem Abouri[2], Salah Soaub[2] and Amane Jada[3]

[1]Lab. of Physical and Bioorganic Chemistry, FST of Mohammedia, Hassan II Univ., Mohammedia, Morocco

[2]Lab. of Process Engineering and Environment, FST of Mohammedia, Hassan II Univ., Mohammedia, Morocco

[3]Institute of Materials Sciences of Mulhouse, Mulhouse, France

sakhi.dalila@gmail.com, meriemabouri@hotmail.com, amanejada@gmail.com

Abstract—The coagulation flocculation process with ferric chloride as coagulant and polymer as a flocculant was optimized for the elimination of heavy metals from a real textile wastewater using 42 composite central and surface response method. The effect of the three factors (pH, dose of coagulant and volume of flocculant) on the elimination of heavy metals was investigated and found to be positive. The optimal conditions obtained from the compromise of the desirable responses such as Cd removal, Pb removal, As removal, Ba removal and Se removal were 0.64 g/L of coagulant dosage 2.6 g/L of flocculant dosage at pH 8.1. The maximum removal of Cd, Pb, Ba As and Se in this study achieve respectively 38.49%, 78,88% and 61.88 % 60.63%, 81.76%, 47.01 % with optimal conditions.

Index Terms — real textile wastewater; coagulation flocculation; heavy metals; optimization; plan of experiments; surface response method

Electrochemical detection of metallic trace elements in total atmospheric fallout and particulate matters in Morocco

Younes Khdaychi, Laila Idrissi
Lab. of Process Engineering and Environment, FST-Mohammedia (FSTM), Hassan II University of Casablanca, Mohammedia, Morocco
y.khdaychi@gmail.com, idrissikam@gmail.com

Abstract—The air quality-monitoring network in Morocco does not cover all regions and occasionally gives data on atmospheric metallic particulate pollution. This work makes it possible to find a simple, inexpensive and available method for monitoring this type of pollutants. In this paper, we report an effective, simple, sensitive and low-cost electrochemical method for heavy metals monitoring in rainwater and airborne particulate matters. The glassy carbon electrode modified ex-situ with a thin mercury film (GCE/TMF) was used as a sensor to detect Cd2+ and Pb2+ by square-wave anodic stripping voltammetry (SWASV). The developed sensor showed a linear response in the concentration range of 0.1 – 2.0 µmol.L-1 in HCl 0.1 mol.L^{-1} for both Cd^{2+} and Pb^{2+} heavy metal ions. The calculated limits of detection were 12 and 16 nmol.L^{-1} for Cd^{2+} and Pb^{2+} respectively. Moreover, the proposed electrochemical sensor was successfully applied to monitor Cd^{2+} and Pb^{2+} in rainwater and particulate matter samples collected in Mohammedia city. The obtained results showed some exceedances of the limit standards preconized for cadmium and lead elements.

Index Terms — Electrochemical analysis; Thin mercury film electrode; Heavy metals ions; Air quality; Rainwater; Particulate matters

Meaning Negotiation

Djoher Dalila Graba, Nabil Keskes and Djamel Amar Bensaber
Computer Science, High School of Computer Sciences, ESI SIDI BEL ABBES, ALGERIA
{d.graba, n.keskes, d.amarbensaber}@esi-sba.dz

Abstract— nowadays, the web is becoming highly used technology, in our community. This technology allows us to work in collaboration and to share knowledge. The pragmatic web represents the most recent extension of the web (semantic web); which facilitates the exploitation and the interpretation of the data by the machine. This web is based on three important components, the context (part of the domain), the community and the meaning negotiation. The Meaning negotiation is the most important component of the pragmatic web on which we will fix our attention. It plays an important role in exchanges and resolves conflicts in people cooperation activities (by reducing inconsistencies and uncertainty). The knowledge (context) of each part in the community of users are heterogeneous; this will make the meaning negotiation complicated. We briefly introduce an approach to improve the meaning negotiation process by using the merge between context and domain. Such an approach can help to deal with issues like information overload and relevance of information. The presented paper (1) defines all concepts in the pragmatic web and meaning negotiation, (2) introduces a comprehensive state of the art in the literature of the meaning negotiation in the pragmatic web, and (3) sketch a vision for future work, that will try to answer the question if the fusion of ontology will positively affect the processes of the meaning negotiation.

Index Terms —Meaning Negotiation, ontology, Pragmatic Web, Contextual Ontology, Domain Ontology

978-9854-28-3@2018-Springer

A Hybrid Multilingual Sentiment Classification using Fuzzy Logic and Semantic Similarity

Youness Madani[1], Mohammed Erritali[2] and Jamaa Bengourram[3]
[1]GI lab., Depart. of Computer Sciences, FST, Sultan Moulay Slimane Univ., Beni Mellal, Morocco
[2]TIAD lab., Depart. of Computer Sciences, FST, Sultan Moulay Slimane Univ., Beni Mellal, Morocco
[3]GI lab., Depart. of Industrial Engineerings, FST, Sultan Moulay Slimane Univ., Beni Mellal, Morocco
younesmadani9@gmail.com, m.erritali@usms.ma , bengoram@yahoo.fr

Abstract— In recent years, the domain of the classification of the social network's data has received an increasing interest, it aims to extract opinions, emotions and attitudes from social networks data such as Facebook comments or tweets...etc, this new scientific research area called sentiment analysis (sometimes called opinion mining). In this article we propose a new method to classify tweets into three classes: positive, negative or neutral, the proposed method is a new hybrid approach based on the fuzzy logic with its three important steps (Fuzzification, Rule Inference/aggregation and Defuzzification) and the concepts of information retrieval system(IRS) by calculating the semantic similarity between a tweet to classify and two opinion documents(one for the positive opinion words and another one for the negative opinion words) using the WordNet dictionary. To remedy the calculation time's problem if we have a huge dataset of tweets we decide to parallelise our work using the Hadoop framework with its distributed file system(HDFS) and the MapReduce programming model. The experimental results show that our approach outperforms some other methods from the literature and that by using the fuzzy logic we improve the results of the classification.

Index Terms — opinion mining, Sentiment analysis, Twitter, Fuzzy Logic, Information Retrieval Systems, Semantic Similarity, WordNet, big data, Hadoop

978-9854-28-3@2018-Springer

Fuzzy semantic-based similarity and big data for detecting multilingual plagiarism in Arabic documents

Hanane Ezzikouri[1], Mohamed Oukessou[1], Youness Madani[2] and Mohammed Erritali[2]
[1]LMACS lab., Mathematics Depart., FST, Sultan Moulay Slimane Univ., Beni-Mellal, Morocco
[2]TIAD lab., Depart. of Computer Sciences, FST, Sultan Moulay Slimane Univ., Beni Mellal, Morocco
ezzikourihanane@gmail.com

Abstract— Plagiarism (intelligent-monolingual) is a complicated fuzzy process, adding translation and making it a cross language problem turn thing to be more obfuscated, what pose difficulties to current plagiarism detection methods. Multilingual plagiarism nature could be more complicated than simple copy+translate and paste, it is defined as the unacknowledged reuse of a text involving its translation from one natural language to another without proper referencing to the original source. Before the detecting process several NLP techniques were used to characterize input texts (tokenization, stop words removal, post-tagging, and text segmentation). In this paper, fuzzy semantic similarity between words is studied using WordNet-based similarity measures Wu&Palmer and Lin. In any data processing system, the common problem is efficient large-scale text comparison, especially fuzzy-based semantic similarity to reveal dishonest practices in Arabic documents, first due to the complexity of the Arabic language and the increase in the number of publications and the rate of suspicious documents sources of plagiarism. To remedy this, vague concepts and fuzzy techniques in a big data environment will be used. The work is done in a parallel way using Apache Hadoop with its distributed file system HDFS and the MapReduce programming model. The proposed approach was evaluated on 400 English and Arabic cases of different sources (news, articles, tweets, and academic works), including 25% machine based translated plagiarism cases, and 75% translated (machine and human based) with a percentage of obfuscated plagiarism e.g. handmade paraphrases and back-translation. We effectuate some experimental verifications and comparisons showing that results and running time of Fuzzy-WuP are better than Fuzzy-Lin. Results are evaluated based on three testing parameters: precision, recall and F-measure.

Index Terms —CLPD; Fuzzy sets; Semantic Similarity; Hadoop; HDFS; MapReduce

978-9854-28-3@2018-Springer

Sustainable Development: Clustering Moroccan Population Based on ICT and Education

Zineb El Asraoui and Abdelilah Maach
Mohammadia school of Engineers-LRIE team, Mohammed V Univ., Rabat, Morocco
zinebelasraoui@gmail.com, Amaach@gmail.com

Abstract— ICT and education relationship is increasingly recognized as important enablers of sustainable development growth. However, the validity of this theory still ambiguous in countries under development: as the case of morocco. The present study focused on determining the correlation between education (university degree as factor) and ICT (Internet access as factor). Data was extracted from public census 2014. A procedure combining tabular data and machine learning algorithms (K-means) was used to determine clusters of population accordingly to their access to Internet and level of education. The results showed that using K-means algorithm four clusters were identified for both rural and urban domains. This identification was verified by a level deepening starting with the regions then municipalities. This profound allows us to make a comparison between the regions and the municipalities clusters in the same territory (rural or urban), then an analysis based on resemblance between rural and urban population. The following conclusions are drawn. For both urban and rural territories, the population of the cluster with the highest level of ICT and education, does not completely match with its counterpart in the municipalities. The same conclusion is applied for the lowest clusters. The comparison between the urban and rural clusters proves the incoherence between the two. The regions (or municipalities) that are in the cluster with the highest levels in the urban domain figure in the cluster with the lowest levels, and vice-versa.

Index Terms —Sustainable development; ICT; Education; Clustering; K-means

978-9854-28-3@2018-Springer

An overview of Big Data and Machine learning paradigms

Imad Sassi, Samir Anter and Abdelkrim Bekkhoucha
Lab. Informatique de Mohammedia (LIM), FSTM, Hassan II Univ. of Casablanca, Morocco
imadsassi7@gmail.com, antersamir@gmail.com, abekkhoucha@hotmail.com

Abstract— Nowadays, Big Data is one of the most famous concepts in the world of new technology and decision making. It refers to a huge mass of varied and complex data that is gathered from different sources and exceed the storage and processing capacity of traditional applications and whose analysis and exploitation must increasingly be done in real time. In the first part of this paper, we will present an overview of Big Data, its characteristics and sources as well as its application areas. Then, we will discuss some of problems and challenges related to this concept. Examples of Big Data technologies and platforms will also be presented. In the second part, we will highlight some of the most promising Big Data Analytics methods, meanly Machine Learning. We conclude by proposing a taxonomy of Machine Learning techniques and methods in the context of Big Data.

Index Terms —Big Data; IoT; Data Analytics; Machine Learning; Hadoop; MapReduce

978-9854-28-3@2018-Springer

Transition model from articulatory domain to acoustic domain of phoneme using SVM for regression:

Towards a silent spoken communication

Aouatif Bencheikh and Abdeljabbar Cherkaoui
Lab. of innovative technologies, National School of Applied Sciences, Tangier, Morocco
Bencheikh.aouatif@gmail.com, Cherkaoui.lti@gmail.com

Abstract— This work is part of our project entitled: "Reconstitution speech by ultrasound imaging and video of the vocal apparatus: towards a silent spoken communication". Our objective is producing a normally articulate speech and not vocalized, from the vocal apparatus activity during a silent articulation. The system to conceive is based on tongue and lips images in silent articulation. So, it becomes necessary to conduct the recognition based on smaller speech units (typically phonemes). Several studies have been developed in the speech recognition, but our work treats more recent issue that is based on image analysis in order to produce speech. In this study, we propose a model of transition from articulatory domain to acoustic domain of phoneme. We extract features from lips and tongue images using SIFT and HOG methods, and we use acoustic features of phonemes. Then, we operate regression analysis to predict the acoustic destination for each articulatory phoneme using SVM for regression. Our method is evaluated by using Correlation Coefficient and Mean squared Error showing that the reached results are interesting.

Index Terms —Reconstitution speech, silent spoken communication, tongue and lips images forms, phonemes, silent articulation, speech recognition, model of transition, SIFT , HOG ,regression analysis, SVM , regression, Correlation Coefficient, Mean squared Error.

Arabic Stop Consonant Acoustic Characterization

Farchi Mohamed[1], Tahiry Karim[1], Mounir Badia[2], Mounir Ilham[2] and Mouhsen Ahmed[1]
[1]IMMII Laboratory, FST, Settat, Morocco
[2]LAPSSII Laboratory, Graduate School of Technology, Safi, Morocco
simo.farchi@gmail.com, karim.tahiry@gmail.com, mounirbadia2014@gmail.com, ilhamounir@gmail.com, ahmed.mouhsen@uhp.ac.ma

Abstract— The present study investigates Arabic stop consonants. Our goal is to give sufficient acoustic cues for detecting and characterizing such consonants. In general, speech is made with sequences of consonants (fricatives, nasals and stops), vowels and glides. The first task is then to separate stop consonants from other phonemes. From an acoustic point of view, stop consonants are characterized by abrupt changes in speech signal. To detect such changes, we exploit landmarks method. The second purpose of this work is to give a relevant characterization of stop consonants by using normalized closure and release durations and computing the spectral moments.

Index Terms —Arabic stop consonants; landmarks; spectral moments; closure duratio; release duration.

Capturing Hadoop Storage Big Data layer meta-concepts

Allae Erraissi and Abdessamad Belangour
Laboratory of Information Technology and Modeling LTIM
Hassan II University, Faculty of Sciences Ben M'sik, Casablanca, Morocco

Abstract— Nowadays, producing streams of data is not helpful if you cannot store them somewhere. Applications, software, and objects generate huge masses of data, which need to be collected, stored, and made available for analysis. Moreover, these data are very valuable and need to be preserved. That is why Big Data has attracted global interest from all the leaders of information technology and new ways of storing information have emerged and flourished. Accordingly, while proceeding our analysis on this subject, we note that in terms of Big Data architecture, the storage layer is very useful and is essential for the proper functioning of any Big Data system. In fact, there are two types of storage at this layer: Hadoop distributed file system (HDFS) and NoSQL databases. We relied on previous works in which we identified key storage concepts through comparative studies of main big data distributions. The storage layer is located directly above Data Sources and Data ingestion layers for which we already proposed a meta-model. Thus, in this paper, we applied techniques related to Model Driven Engineering 'MDE' to provide a universal Meta-modeling for the storage layer at the level of a Big Data system.

Index Terms —Meta-model; Big Data; Storage layer; Model Driven Engineering; NoSQL Databases; HDFS

An improved predictive model of text categorization based on feature selection using genetic algorithm and random forests for classification:: case for business documents

Fatima Ezzahra Lagrari[1], Ziyati Houssaine[2], and Youssfi El Kettani[1]
[1]Department of mathematics, Ibn Tofail Univ., Kenitra, Morocco
[2]Department of Computer Science, High School of Technology, Casablanca, Morocco

Abstract— Huge amount of information is saved as text documents that are not classified, therefore the remaining issue is the recognition and classification of this text documents into the corresponding categories. Such text categorization requires the use of feature selection techniques in order to reduce dimensionality which could enhance the model's selectivity, accuracy and robustness. The present paper proposes a text categorization model based on feature selection using genetic algorithm and random forest method. The proposed approach has been tested on a publicly available dataset of business documents and results show classification accuracy of about 98.7% which outperforms other techniques tested on the same dataset.

Index Terms — Feature Selection, Genetic Algorithm, Text Mining, Random Forests, Business Documents

978-9854-28-3@2018-Springer

Towards an Improvement of the Software Documentation using a Traceability Approach

Othmane Rahmaoui, Kamal Souali and Mohammed Ouzzif
Computer Science Hassan II Univ., ESTC RITM Lab. Casablanca, Morocco
othmane.rahmaoui@gmail.com , kml.souali@gmail.com , ouzzif@gmail.com

Abstract— Today traceability is a buzz word and it used in several domains like healthcare, food industry and transportation sectors. In Information Technology (IT), traceability plays a very important role and it can be defined in various ways, depending on the environment and the process under consideration. Software engineering is a field that allows applying several approaches to design, operate and maintain software systems and the study of all the activities involved in the realization of high-performance information systems. Over the years, there have been major changes in the type of software systems developed; however, Traceability is one of the essential activities of good software development lifecycle because it helps to reduce the effort required to determine the impacts of requested changes. Software Documentation plays also a very important role in the Software Engineering and without it, it is hard to maintain any software project and every new project we will reinvent the wheel. In this work, we propose a new approach to improve the software documentation with data traceability management.

Index Terms — traceability, software documentation, trace, data traceability

978-9854-28-3@2018-Springer

Topic Hierarchies for Knowledge Capitalization using Hierarchical Dirichlet Processes in Big Data Context

Badr Hirchoua[1], Ouhbi Brahim[1] and Frikh Bouchra[2]
[1]LM2I laboratory, ENSAM Moulay Ismail University, Meknes, Morocco
[2]LTTI laboratory, ESTF, Sidi Mohamed Ben Abdellah University, Fes, Morocco
Badr.hirchoua@gmail.com , ouhbib@yahoo.co.uk , bfrikh@yahoo.com

Abstract— Intelligent Technologies and research results fro the field of knowledge management, have steadily and progressivel improved knowledge quality, over the course of th last decades, especially in the current industrial context. The companies consider the knowledge as an important strategic resource for innovation. This paper focus on the problem of learning topic hierarchies from knowledge. The aim targeted is to respond to knowledge capitalization issues in big data context, by proposing a Knowledge capitalization system as an adaptive intelligent technique. This system acts on top of a big data platform and runs on large scale globally to constitute a robust intelligent knowledge capitalization paradigm, with a clear separation of concerns. The architecture considers a batch processing as a preparation stage which starts by extracting hidden topics, by means of the HLDA in order to handle the complexity of multi knowledge domains, and to keep the semantic relations between knowledge entities. The hierarchical mechanism gives an effective and flexible way to store and analyses the knowledge. As a result, the time responding is obtained of high quality in comparison with the systems which uses LSA and LDA approach as a preparation stage.

Index Terms — Knowledge capitalization, data intelligence, topic modeling, machine learning, big data computing

978-9854-28-3@2018-Springer

Amazigh POS Tagging using TreeTagger: A Language Independant Model

Amri Samir and Zenkouar Lahbib
ERSC Laboratory, EMI School Med V University, Rabat, Morocco
amri.samir@gmail.com , zenkouar@emi.ac.ma

Abstract— Part of Speech (POS) tagging has high importance in the domain of Natural Language Processing (NLP). POS tagging determines grammatical category to any token, such as noun, verb, adjective, person, gender, etc. Some of the words are ambiguous in their categories and what tagging does is to clear of ambiguous word according to their context. Many taggers are designed with different approaches to reach high accuracy. In this paper we present a Machine Learning algorithm, which combines decision trees model and HMM model to tag Amazigh unknown words. In case of statistical methods such as TreeTagger, this will have added practical advantages also. This paper presents creation of a POS tagged corpus and evaluation of TreeTagger on Amazigh text. The results of experiments on Amazigh text show that TreeTagger provides overall tagging accuracy of 93.19%, specifically, 94.10% on known words and 70.29% on unknown words.

Index Terms — POS Tagging; TreeTagger; Amazigh; Corpus

Automated Checking of Conformance to SBVR Structured English notation

Abdellatif Haj, Youssef Balouki and Taoufiq Gadi
LAVETE Laboratory, Department of Mathematics and Computer Science,
FSTS, Hassan 1st University, Settat, Morocco
haj.abdel@gmail.com

Abstract— Business rules are generally captured in a natural language. The inherit ambiguity of the latter is often seen as a cause for project failure, which makes it necessary to translate natural language business rules statements to another language sufficiently formal. However, business experts are generally not familiar with formal languages, which can complicate the communication between stakeholders. For this reason, Object Management Group (OMG) had proposed SBVR Standard (2008) for modeling complex organizations in a natural language but in a formal and detailed way. As a result, several studies have succeeded to increase the accuracy of their approaches by transforming their models from/to SBVR standard. Clearly then, the success of these approaches depends on the quality of the SBVR based statements used or generated. This paper presents an approach for checking conformance of both lexicon and syntax of Business Rules (BR) expressed with Semantic of Business Vocabulary and Rules (SBVR), to SBVR Structured English notation (SBVR-SE) using Natural Language Processing (NLP).

Index Terms — Business Rules; Semantic of Business Vocabulary and Rules; Natura Languag Processing; NLP; BR; SBVR;SBVR Structured English.

A Comparative Study of Standard Part-of-Speech Taggers

Imad Zeroual and Abdelhak Lakhouaja
Computer Science Depart., FS, Mohamed 1st Univ., Oujda, Morocco
{mr.imadine, abdel.lakh}@gmail.com

Abstract— The Part of Speech (PoS) tagging is resolving ambiguity during text processing to assign morphosyntactic tags to each word according to the context. It is an essential task in several fields, particularly corpus linguistics and Natural Language Processing (NLP). Several PoS taggers and tools are already in service as open source or as commercialized solutions. Therefore, deeper investigation regarding their performance is required especially for under-resourced languages like Arabic. Some well-known probabilistic methods were adapted for PoS tagging such as Hidden Markov Models (HMMs), Support Vector Machines (SVM), and Decision Tree (DT). Based on these methods, language-independent PoS taggers have been developed namely TnT, SVMTool, and Treetagger. In fact, this article presents very important topic which concerns, on the one hand, an adaptation of Standard PoS taggers for the Arabic language, and in the other hand conducting very rich and comparative studies and evaluation. Basically, Arabic PoS taggers are very sensitive to the number of the tagsets used and the text form processed, therefore, four different tagsets and two text forms (i.e., Classical and Modern Standard Arabic) have been used.

Index Terms — PoS tagging; TnT; SVMTool; Treetagger; Arabic

978-9854-28-3@2018-Springer

Analysis Of Speaker's Voice In Cepstral Domain Usign MFCC Based Feature Extraction And VQ Technique For Speaker Identification System

Mariame Jenhi[1], Ahmed Roukhe[2] and Laamari Hlou[1]
[1]Lab. of Electrical Engineering and Energy System, FS, Univ. Ibn Tofail, Kenitra, Morocco
[2]Lab. of Atomic, Mechanical, Photonics and Energy, FS, Univ. Moulay Ismail, Meknes, Morocco
jenhi.mariame@gmail.com

Abstract— An essential initial phase in speaker recognition systems (SRS) is the extraction of reliable features from human voice that captures the unique characteristics of the speaker's voice. In this paper, we proposed to investigate the performance of short-term spectral characteristics of speaker's speech signal especially the Mel frequency cepstral coefficient (MFCC) approach for a text-dependent speaker identification system. The effectiveness evaluation of the MFCCs features is done with Vector quantization (VQ) using the best-Known Linde-Buzo-Gray (LBG) classifier algorithm approach. We study the identification accuracy using different codebook size. Classification results show that the text-dependent speaker identification system yield an identification accuracy of 87.5% for codebook size 8,16,32,64. We have tested eight speakers consisting 5 male and 3 female speakers.

Index Terms — automatic speaker identification; mel-frequency cepstral coefficient (MFCC); vector quantization (VQ); Codebook; Linde-Buzo-Gray (LBG)

978-9854-28-3@2018-Springer

Approaches and algorithms for resource management in OFDMA access mode: Application to mobile networks of new generation

Sara Riahi and Ali Elhore
Department of Computer Science, FS, Chouaib Doukkali Univ., El Jadida, Morocco

Abstract— The increased need for speed and mobility is the cause of the rapid evolution of mobile radio systems during the last decade. In mobile radio communication systems for broadband (eg UMTS, HSDPA, WiMax, LTE, ... etc.), an intense research activity on optimization and radio resource management techniques (RRM Radio Resource Management) is conducted. Management and resource optimization are two themes dealt with separately. This study achieves two goals: achieving an overview of different methods and approaches for allocation of radio resources and focus on the optimization algorithms dedicated to the allocation of resources in the single cell case by deploying one of the most promising access technologies in terms of speed called OFDMA.

Index Terms — OFDMA, Radio Resources, adaptive and random allocation, optimization algorithms, bandwidth allocation, assigning subcarriers.

A new efficient technique to enhance quality of service in OLSR protocol

Moulay Hicham Hanin[1], Youssef Fakhri[1] and Mohamed Amnai[1,2]
[1](LARIT) Lab., Depart. of computer sciences, Kenitra, Morocco.
[2] (LIPOSI) Lab. National School of Applied Sciences Khouribga, Morocco
haninone@gmail.com, fakhri-youssef@univ-ibntofail.ac.ma, mohamed.amnai@uhp.ac.ma

Abstract— A routing protocol, in Mobile ad hoc networks (MANETs) use global information about the network topology and communication links to handle the data exchange between communication nodes. Several architectures and protocols have been defined to optimize transmission data between nodes. OLSR (Optimized Link State Routing) was proposed owing to Multipoint Relays (MPRs) that reduce the number of redundant retransmissions while diffusing a broadcast message in the network. In this paper we propose a new efficient mechanism, named F-QMPR-OLSR to select MPRs in OLSR protocol, which use two methods. The first use fuzzy systems based three quality of service (QoS) metrics as inputs: Buffer Availability, Stability and SINR (Signal to Interference plus Noise Ratio) and return as output the high efficient selection of MPRs. The second is to adjust the value of a node's willingness parameter to best perform and improve network lifetime, and therefore it can improve the network transmission capacity. Implementation and simulation experiments with Network Simulator NS2 are presented in order to validate our contribution. The results show that F-QMPR-OLSR achieves a significant improvement of data packets exchange quality in term of QoS.

Index Terms —MANET; OLSR; QOLSR; QMPR; Fuzzy Logic; SINR Stability; Buffer

Performance Assessment of AODV, DSR and DSDV in an Urban VANET Scenario

Khalid Kandali and Hamid Bennis
TIM Research Team, EST of Meknes, Moulay Ismail University, Meknes, Morocco
kandalikhalid@hotmail.com, hamid.bennis@gmail.com

Abstract— The wireless system of communication has recently known a considerable evolution, which has led to the appearance of a new type of networks called Vehicular Ad-hoc Networks (VANET). This innovative approach is crucial for enhancing the quality of the driving experience as a whole: the safety of the drivers, traffic management and the entertainment of the passengers. Thus, the selection of an appropriate routing protocol is necessary to support high mobility, rapid changing topology and capacity of mobility prediction. In this paper, we evaluate the performance of a set of well-known routing protocols used in VANET, namely AODV, DSR and DSDV in terms of Packet Delivery Ratio (PDR), Throughput, and Normalized Routing Load (NRL), in order to find out the suitable routing protocol for high density traffic area such as Casablanca. In this paper, the real map of Casablanca is edited by Open Street Map (OSM), and the "Simulation of Urban Mobility" (SUMO) tool is used to create the mobility model, while the traffic model generation and the simulations are carried out using Network Simulator 2 (NS2).

Index Terms —VANET ITS; AODV; DSR; DSDV; OSM; SUMO; NS2

Analytical study of the performance of communication systems in the presence of fading

Sara Riahi[1] and Azzeddine Riahi[2]
[1]Department of Computer Science, Chouaib Doukkali Univ., FS, El Jadida, Morocco
[2]IMC Lab., Depart. of Physics, Chouaib, Doukkali Univ., FS, El Jadida, Morocco
riahisaraphd@gmail.com, riahikh@gmail.com

Abstract— The environment in which a communication system emits electro-magnetic waves represents the propagation channel. The propagation of electromagnetic waves in the channel include several problems related to the propagation medium which can be intercepted, reflected or diffracted by obstacles of different nature such as buildings, buildings, trees. Depending on the nature of the path, the received signal is composed of several wave attenuated and delayed in time, causing dispersive fading. These result in a substantial degradation in performance of a communication system. So the characterization of the propagation channel is a necessary step for the development of communication system. Knowing the properties and defects that brought on a transmission, adapted techniques can be developed.

Index Terms — Fading, Channel, Modelization, Noise, Rayleigh, Rice, Nakagami

Contribution to the improvement of the Quality of Service over Vehicular ad-hoc Network

Ansam Ennaciri[1], Rania Khadim[2], Mohammed Erritali[2], Mustapha Mabrouki[1], Jamaa Bengourram[1]
[1]Depart. of Indust. Eng., FST, Sultan Moulay Slimane Univ., Beni Mellal, Morocco
[2]TIAD Lab., Depart. of Computer Sciences, FST, Sultan Moulay Slimane Univ., Beni Mellal, Morocco
ennaciri.ansam@gmail.com, khadimrania@gmail.com, m.erritali@usms.ma, mus_mabrouki@yahoo.fr, bengoram@yahoo.fr

Abstract— Nowadays Vehicular Ad hoc Network represents an interesting part of intelligent transportation system (ITS). This latter attempt to answer the question of how to improve road safety, to maintain best-effort-of service, and to provide better conditions for drivers and passengers. Indeed, connected vehicles will operate in a connected/smart city. It then becomes necessary to implement solutions to manage urban traffic while responding as accurately as possible to road traffic and congestion problems. However, the Quality of service is an important consideration in vehicular ad hoc networks because of rapid development in network technology and real time applications like multimedia, voice, video streaming, etc. In this paper, we propose a new approach for road traffic management in smart cities which maintain shortests paths, based on graph theory in order to facilitate traffic management, through using a specific algorithm. In order to improve the quality of service over vehicular ad hoc network, a new method is then presented, which ensures vehicle safety by minimizing the number of interchange between vehicles, minimize energy and lifetime of the sensors.

Index Terms — Graph theory; Video straming; ad-hoc network; VANET; QOS.

The effect of Transmit Power on MANET routing protocols using AODV, DSDV, DSR and OLSR in NS3

Abdellah Nabou[1], My Driss Laanaoui[2] and Mohammed Ouzzif[1]
[1]RITM Lab., CED Engineering Sciences, EST, ENSEM, Hassan II Univ. of Casablanca, Morocco
[2]Depart. of Computer, FST, Cadi Ayyad Univ., Marrakesh, Morocco
a.nabou@ensem.ac.ma, d.laanaoui@uca.ma, ouzzif@gmail.com

Abstract— Since last decades mobile ad hoc networks, (MANETs) become very interesting subject of researching. MANET is defined as network without infrastructure that connect mobile devices named nodes like computers, smartphones, tablets or any other device by using wireless channel to communicate with each other, without aid of any additional equipment or admin intervention. Manet uses specific protocols intended for wireless ad hoc environment. These protocols experience constraints in their operation on several levels such as mobility, energy consumption, security etc. In this paper we evaluate four MANET routing protocols are performances compared to the transmission power used by each node in network to send data. We have chosen all the standard protocols available in the ns3 simulator AODV (Ad hoc On Demand Distance Vector Routing), DSDV (Destination Sequenced Distance Vector Routing), OLSR (Optimized Link State Routing) and DSR (Dynamic source routing). Also, we used five important metrics to analyze the performance for these protocols as Throughput, Packet Delivery Ratio, End-to-End delay, Jitter delay and Packet Lost.

Index Terms — MANET; AODV; DSDV; DSR; OLSR; Transmission Power; Performance

Performance evaluation of VANETs routing protocols using SUMO and NS3

Amina Bengag and Mohamed Elboukhari
MATSI Laboratory, ESTO, Oujda, Morocco
bengag.amina@gmail.com, elboukharimohamed@gmail.com

Abstract— Vehicular Ad-hoc network (VANET) is a selforganized ad hoc network, in which each vehicle, equipped with On Board Unit (OBU), participates in routing by forwarding data for other nodes. VANETs become a really hot topic and a challenging research field as it has several issues related to security, quality of service, routing protocols, etc. Although the big challenge in VANET is to design a routing protocols more suitable to route packets efficiently to their final destination, in spite of the high speed of vehicles, frequent disconnection and the highly changeable topology. This paper presents and analyses, the impact of vehicle density on the performance ofthe most well-known routing protocols. Quantitative metrics average end to end delay are evaluated using the Network Simulator NS-3 and SUMO.

Index Terms — VANETs, routing protocols, NS3, SUMO

Single-Valued Neutrosophic Techniques for Analysis of WIFI Connection

Said Broumi[1], Rao V. Venkateswara[2], Mohamed Talea[1], Assia Bakali[3], Prem Kumar Singh[4] and Florentin Smarandache[5]
[1]Lab. of Information Processing, FS, Ben M'Sik, Univ. Hassan II, Casablanca, Morocco
[2]Mathematics Division, Depart.of S&H, Chirala Engineering College, Chirala, India
[3]Ecole Royale Navale, Boulevard Sour Jdid, Casablanca, Morocco
[4]Amity Institute of Information Technology, Amity Univ., Noida-Uttar Pradesh, India
[5]Depart. of Mathematic, University of New Mexico, UNM Gallup, USA
broumisaid78@gmail.com, vunnamvenky@gmail.com , taleamohamed@yahoo.fr, assiabakali@yahoo.fr, premsingh.csjm@gmail.com, fsmarandache@gmail.com

Abstract— Wireless ad hoc networks (WANET) are selfconfiguring networks which do not rely on pre-existing routers or access points. Mobile ad hoc network (MANET) is one of the application of WANET where mobile devices are connected wirelessly without any infrastructure. Such networks are either considered as connected properly (means connected), not connected or the network is connected sometimes and disconnected sometimes i.e., there is an uncertainty in connectivity. In this case characterizing the truth, indeterminacy and falsity information communicated in the mobile network is difficult tasks while utilizing the traditional mathematical set theories. To resolve this issue in current paper authors' focus on estimating these of information processing in MANET using the properties of Single valued neutrosophic logic and its mathematical analysis. The proposed method is also illustrated with an example for better understanding the MANET in neutrosophic environment.

Index Terms — Neutrosophic sets, WANET; MANET;Network connection; low-medium-high estimations

Latency over Software Defined Network

Souad Faid and Mohamed Moughit
Mobility and Modeling IR2M Lab., Univ. Hassan 1st, Settat, Morocco
faidsouad@gmail.com , mohamed.moughit@uhp.ac.ma

Abstract— Telecom operators are always looking to optimize the deployed resources while ensuring the satisfaction of their customers, supporting end-to-end Quality of Service (QoS) in existing network architectures is an ongoing problem. Software SDN is the evolving network concept, which makes possible the automation of control and services development. Its main advantages are the centralized global network view, programmability, and separation of the data plane and control plane. These features have got attention of researchers to improve the QoS provisioning of today's various network applications. We aim at making a picture of QoS-motivated literature in OpenFlow-enabled SDN networks. The main goal of this paper is to present a comparison of SDN and Hardware Defined Network (HDN) in terms of QoS metrics like latency by using a POX Controller.

Index Terms — Quality of service(QOS); SDN; HDN; POX Controller;OpenFlow

IoT data-based architecture on OpenStack for Smart City

Chaimaa Ait Belahsen, Lyhyaoui Abdelouahid and Nadia Boufardi
LTI Lab, ENSA of Tangier, Tangier Principal Morocco
chaimaa.belahsen.cb@gmail.com, nadiabufardi@gmail.com, lyhyaoui@gmail.com

Abstract— The integration of the Internet of things (IoT) with the power of Cloud Computing and the Big Data insight to build a Smart City is absolutely the main aim of this Article. From the point of view of most governments, adopting a Smart City concept in their cities by implementing Big Data applications, offers the potential for cities to obtain and reach the required level of development and sustainability. Cloud computing and IoT are two distinct technologies having wide applications in human life. Their acquisition and use are extremely pervasive, making them the future of the internet. Therefore, in this article we propose an IoT detailed, scalable and secured architecture on OpenStack: an open source platform for establishing public and private clouds, for the IoT data management, analyzing and processing from a raw data to an insight. Tangier as a fast-growing population city attending in 2017, 1 million people, will be our goal for implementing our smart applications by collecting from sensors enclosed to its infrastructure the data to treat. For this, we will use sensors deployment including smart parking, smart home, smart weather and water sensors… We are proposing an efficient and scalable architecture which gather all the IoT on the cloud workflow important components.

Index Terms — Big Data, Smart City, IoT, Cloud Computing, OpenStack, Hadoop, Spark

An Extended Data as a Service Description Model for Ensuring Cloud Platform Portability

Abdelhak Merizig[1], Hamza Saouli[1], Maite Lopez Sanchez[2], Okba Kazar[1] and Aïcha Nabila Benharkat[3]
[1]LINFI Laboratory, Computer Science Depart., Univ. of Biskra, Algeria
[2]Mathematics and Computer Science Department, University of Barcelona, Spain
[3]LIRIS Laboratory, INSA Lyon, Lyon University, France
merizig.abdelhak@gmail.com, Hamza_saouli@yahoo.fr, maite_lopez@ub.edu, okbakaza@yahoo.fr, nabila.benharkat@liris.cnrs.fr

Abstract— Nowadays there is a myriad of different Cloud services deployed in datacenters around the world. These services are presented by means of models offered as services on demand (SaaS, PaaS and IaaS). At a different level, the companies aim at finding some services that manage their data in order to enhance their process and increase their benefits. The massive quantity of data and the heterogeneous types of data deployed in the Cloud made the discovery task much important. In addition, one big problem in discovery task is the absence of description model to represent data services (Data as a service; DaaS). Moreover, the location of services made the selection and composition process much very hard, especially for functional and non-functional parameters. In this paper, we plan to solve these problems by introducing an extended description model for data services, in order to reduce the number of services during the selection and composition process. The implementation shows the effectiveness of the proposed model.

Index Terms — Data as a service, Service Model, Service Discovery, Extensible language, Cloud Computing, QoS, XML

Localization and tracking system using Wi-Fi signal strength with wireless sensors network

Douae Zbakh, Abdelouahid Lyhyaoui and Mariam Tanana
LTI Lab, ENSA of Tangier, Tangier, Morocco
Douae.zbakh@gmail.com , lyhyaoui@gmail.com, mariam.tanana@gmail.com

Abstract— Indoor location and tracking systems based on Wi-Fi signals are both gainful and precise, they are able to attain certain positioning level using existing Wi-Fi infrastructure environment. The implementation within a wireless sensors network proffer an updating card that estimate true values of RSSI on the fingerprints points and combine algorithms localization that offer accurate positions estimations. In this paper a localization algorithm will be described it offers a good accuracy using a particular filter which tracks multiple points to characterize a trajectory. Finally, an evaluation of methods performance is desirable to verify that the system is more accurate and efficient on tracking.

Index Terms — Wireless sensor network, Localization algorithm, Indoor location, access point, signal strength, location tracking.

Performance Evaluation Of Multicast Routing Protocols in MANET

Safaa Laqtib[1], Khalid El Yassin[1]i and Moulay Lahcen Hasnaoui[2]
[1]Informatics and Applications Lab. (IA), Depart. of Mathematics and Computer Science, FS, Moulay Ismail Univ., Meknes, Morocco
[2]ISIC ESTM, L2MI Lab., ENSAM Moulay-Ismail Univ., Meknes, Morocco
laq.safaa@gmail.com, khalid.elyassini@gmail.com, myhasnaoui@gmail.com

Abstract— A Mobile Ad-hoc Network (MANET) is self-sufficient network made out of mobile devices associated by wireless links without the utilization of infrastructure. Essential issues in MANET are link failure, limited bandwidth, and restricted battery control, poses many challenging issues in accomplishing quality of service (QoS) arranged correspondence. The target of a multicast routing protocol for MANETS is to support the propagation of data from a sender to every one of the receivers of a multicast group and attempting to utilize the accessible bandwidth efficiently within the sight of successive topology changes. Multicasting can enhance the efficiency of the wireless link when sending multiple copies of messages by abusing the natural broadcast property of wireless transmission. this paper exhibits a broad investigation of multicast routing protocols MAODV, ODMRP, PUMA, AMRoute, and AMRIS for MANET under different network scenarios utilizing parameters like throughput, packet delivery ratio, and average end-to-end delay.

Index Terms — Mobile Ad hoc Networks, Multicast Routing Protocols; MAODV; ODMRP; PUMA; AMroute; AMRIS.

A New RFID Middleware and BagTrac Application

Yassir Rouchdi[1,2], Achraf Haibi[1], Khalid El Yassini[1], Mohammed Boulmalf[2], and Kenza Oufaska[2]
[1] IA Lab., FS of Meknes, Univ. Moulay Ismail, Meknes, Morocco
[2]TIC Lab, International University of Rabat, Rabat, Morocco

Abstract— the purpose of this study is to enhance RFID application benefits as a luggage tracking system, first, by defining RFID architecture, components, functioning and middleware roles. Secondly, by discussing the implementation of Role-Based Access Control as a tool regulating access to RFID data, therefore making authentication methods more robust and flexible. To eventually presenting our BAG TRAC application, allowing easier manipulation and real-time visualization of the luggage transportation process.

Index Terms — RFID; Middleware; BagTrac; RBAC

IoT and vehicular Network

Asmaa Berdigh[1], Khalid El Yassin[1]i and Kenza Oufaska[2]
[1]IA Laboratory - Faculty of Sciences Meknes Moulay Ismail University, Morocco
[2]TICLab Laboratory International University of Rabat, Morocco
asmaberdigh@gmail.com, Khalid.ElYassini@gmail.com, Kenza.Oufaska@uir.ac.ma

Abstract— In this paper, we define the key concepts of IoV as an application of IoT: connected car and an overview of the different communication cases leaded from vehicle to-x namely, vehicle-to-vehicle (V2V), vehicle -to- Internet (V2I), and vehicle-to-road infrastructure (V2R). We also identify promising area of research, Intra-Vehicle Connectivity and the wireless technologies likely to be used for building an intra-vehicle wireless sensor networks. This paper highlighted also the most recurrent transport issues and the IoT outcome solutions, there characteristics and challenges, within a focus on the Intra-Vehicular Wireless Sensor Networks.

Index Terms — connected Car, IoV, Intra-Vehicle Connectivity, V2V, V2I, V2R, Wireless Technologies, CO2 emission

An enhanced localization approch for threedimensional wireless sensor networks

Abdelali Hadir[1], Khalid Zine-Dine[1], Mohamed Bakhouya[2] and Jamal El Kafi
[1]LAROSERI Lab., Chouaib Doukkali Univ., El Jadida, Morocco
[2]International University of Rabat (UIR), Sala el Jadida, Morocco

Abstract— the aim of this paper is to presents a new scheme for sensor node localization technique for three-dimensional (3D) wireless sensor networks (WSNs), denoted as 3DeDV-Hop. In the proposed algorithm, the average hop size of anchor nodes is modified by using a new weighted technique to calculate the new average hop size for anchors. The localization accuracy is further improved by applying 2D-hyperbolic technique instead of trilateration. To improve the positioning coverage of the network, those target nodes which have been localized successfully in the first round of the localization process, are upgraded to assistant anchor node. All the processes and calculations are carried out at target node level, which makes the proposed algorithm energy efficient. Simulation results show that our proposed algorithm outperforms the similar kind of existing algorithms. We have implemented both algorithms in OMNET++ and studied their performance in static wireless sensor networks for three-dimensional. Simulation results show that 3DeDV-Hop outperforms the 3DDV-Hop algorithm in terms of localization accuracy, the number of localized nodes.

Index Terms — Localization; DV-Hop; 3DV-Hop; Sensor; Networks

Study of Quality of Service and Behavior of Routing Protocols in VANET Network

Achraf En-hiri, Soumaya El Mamoune, Mostafa Ezziyyani
Faculty of Sciences and Techniques, Univ. of Abdelmalek Essâadi, Tangier, Morocco
enhiri.achraf@gmail.com, soumayamgi@gmail.com, ezziyyani@gmail.com

Abstract— The VANET (Vehicle Ad Hoc Network) has evolved since its manifestation, several routing applications have been suggested to meet the needs of this type of network which has several obstacles, namely the topological and temporal change, the density of the traffic and the great speed of vehicles. The development of wireless communication has made it possible to find several functionalities, namely a smart vehicle from which intelligent transport systems have emerged. Thus a network VANET. The vehicles have become able to exchange with each other via this new technology, to contribute to the development of road safety and the comfort of the consumers of the road, for this reason the quality of service has become paramount. This paper consists in evaluating the performance of the routing protocols, DSDV and AODV with the two types of interchange: V2V (Vehicle to Vehicle) and V2I (Vehicle to Infrastructure), by using the mobility generator (SUMO) and the simulator of network (NS2).

Index Terms — VANET, ITS, Routing Protocols, AODV, DSDV, V2V, V2I, SUMO, NS2

Dynamic adaptation and automatic execution of services according to ubiquitous computing

Marwa Zaryouli, Mostafa Ezziyyani
Faculty of Sciences and Techniques, Univ. of Abdelmalek Essâadi, Tangier, Morocco
zaryouli.marwa@gmail.com, ezziyyani@gmail.com

Abstract— Many current devices have network connections that allow access to their functionality through a computer network, so ubiquitous applications aim to structure these features to put them to the users' services. Therefore, the behavior of ubiquitous applications depends on the state and availability of entities (software and devices) that make up the environment in which they evolve, the latter characterized by a dynamic availability of functionalities and a heterogeneity of hardware and software devices, and also depends on user preferences and locations. In addition, these applications must adapt according to the context of the user. In this future article, we present an infrastructure dedicated to ubiquitous computing services. These services are in the form of assembly of distributed software components and dynamically discovered according to the location of the terminal and these characteristics. We have implemented this infrastructure, with an example of services to benchmark the performance of services in this environment.

Index Terms — Ubiquitous computing, context of the user, distributed software components.

Deep learning technology for identifying a person of interest in real-world

Hamid Ouanan, Mohammed Ouanan and Brahim Aksasse
ASIA Team, M2I Lab., Dept. of Computer Science, Moulay Ismail Univ., FST Errachidia, Morocco
ham.ouanan@gmail.com, ouanan_mohammed@yahoo.fr , baksasse@yahoo.com

Abstract— In this paper, we will propose a new embedded system prototype called PubFace, which uses the CNN model trained from scratch on facial celebrity images [1], to identify a "Person of Interest" in public space. This is done by tuning this model on new dataset comprising 5000 real images of 1000 different identity collected from social networks as Facebook and Instagram. After I got permission of collected images persons to use their facial images in this scientific research project. Then, we have investigated some ways for compressing the number of parameters of the resulting model to reduce the memory needed for both storing and performing a forward pass while simultaneously preserving acceptable good accuracy.

Index Terms — Feature extraction; face recognition; person of interest; deep learning;

978-9854-28-3@2018-Springer

Fast and Stable Computation of the Tchebichef's Moments Using Image Block Representation and Clenshaw's Formula

Hicham Karmouni[1], Tarik Jahid[1], Mhamed Sayyouri[2], Abdeslam Hmimid[1], Anass El Affar[1] and Hassan Qjidaa[1]
[1]CED-STIC, LESSI, FS Dhar El-Mehraz, Sidi Mohamed Ben Abdellah Univ., Fez, Morocco
[2]LabSIPE, National school of applied sciences, Chouaib Doukkali University, El Jadida, Morocco.
hicham.karmouni@usmba.ac.ma, jahidtarik@gmail.com, mhamed.sayyouri@usmba.ac.ma, abdeslam.hmimid@usmba.ac.ma, anass.dido@yahoo.fr, qjidah@yahoo.fr

Abstract— In this paper, we propose a new method of stable computation of the discrete orthogonal moments of Tchebichef and its inverse. In this method, we have combined two main concepts. The first concept is Clenshaw's recurrence formula to accelerate the calculation process of the Tchebichef moments. The second concept is the partitioning of the image into a set of blocks of fixed sizes where each block is processed independently. This method is meant to accelerate the computation time and improve the quality of images reconstruction. In order to demonstrate the efficiency, the stability and the precision of the proposed method compared to the direct method based of Clenshaw's recurrence formula, some simulations have been performed on different types of images.

Index Terms — Tchebichef's moments; Clenshaw's recurrence formula; image reconstruction; lapped block-based method.

Adherent raindrop detection based on morphological operations

Fouad Elhassouni, and Abdelhak Ezzine
Laboratory of Information and Communication Technologies, National School of Applied Sciences, Tangier, Morocco
elhassouni.fouad@gmail.com

Abstract— The presence of raindrops in an image can highly impact the performance of applications used in Advanced Driver Assistance Systems (ADAS). Therefore, the detection of raindrops remains a necessity, especially in rainy conditions to improve the ADAS performance. In this paper, we present a new approach to detect adherent raindrops in a single image based on the raindrops characteristics and using a combination of image processing techniques.

Index Terms — Adherent raindrops, Morphological operations, ADAS, ellipse fitting.

Collaborative Filtering Recommender System

Yassine Afoudi, Mohamed Lazaar and Mohamed Al Achhab
New Trends Technology, Abdelmalek Essaadi University, Tetuan-Morocco
yassine.afoudi@gmail.com, lazaarmd@gmail.com, alachhab@gmail.com

Abstract— Recently, with the presence of a lot of information and the emergence of many programs, sites and companies that provide items to customers like Amazon for products or Netflix for movies …, it was necessary to exploit this data to achieve a quantum leap in the world of technology and specially do not leave the customer confused in the item to be chosen among other huge options, so many of sciences that are interested in the field of Big data and using the large information to meet the needs of users intervened to improve the area of recommendation such as data science, machine learning.... however, there is one solution to give suggestions for customers is recommender systems. Recommender systems is a useful information filtering tool for guiding users in a personalized way of discovering products or services they might be interested in from a large space of possible options. In another way Recommender System is a tool helping users find content and overcome information overload. It predicts interests of users and makes recommendation according to the interest model of users. On one hand, there is a traditional recommender systems recommend items based on different criteria of users or items like item price, user profile …on another hand we have recommender systems using deep learning techniques even if not been well explored yet, deep learning is most of machine learning algorithms, such as Support Vector Machine (SVM) or Logistic Regression, in recent years, deep learning's revolutionary advances in speech recognition, image analysis and natural language processing have gained significant attention. Research in the field of recommendation is moving in the direction of a richer understanding of how recommender technology may be embedded in specific domains, in this article, we first introduce different kinds of the most famous category of recommender systems and focus on one type to do movies recommendations and then make a quantitative comparison.

Index Terms — Collaborative filtering; Information filtering; Movies recommendation; Recommender system

Audit and control of operations in the insurance sector through the application of the IT reference system

Jamal Zahi, Merieme Samaoui
Mathematical Modeling and Economic Computation Lab. The Hassan 1st University, Settat, MOROCCO
zahi_ja@yahoo.fr, mersamaoui@yahoo.fr

Abstract— The approach presented in this article is a contribution to understanding the issues and consequences in terms of governance and management of IT services considered as supporting the creation of value for the company. This work has the following objectives: to provide a global framework to help companies in the health insurance sector achieve their objectives, understand the need for a control framework based on the need of IT governance and learn the COBIT repository and its components which are control objectives and management directives.

Index Terms — Systems Governance; Health Insurance; COBIT; ITIL; Audit of Information Systems; Risk Management.

Understanding driving behavior: measurement, modeling and analysis

Zouhair Elamrani Abou Elassad and Hajar Mousannif
LISI, Lab., Cadi Ayyad University, Marrakesh, Morocco
z.elamrani@uca.ma, mousannif@uca.ac.ma

Abstract— Human factors contribute in the manifestation of 95% of all accidents; recently there has been a research emphasis on driving behavior established as an outcome of individual actions as well as psychophysical values. This paper pursues the guidelines of systematic literature reviews to present an unbiased survey of the existing research on driving behavior in line with the psychophysical state as well as the behavioral operations of the driver and to develop unconventional taxonomies based upon the nature of the conducted study, measurement patterns and supervision motives underlying the detection and prediction models of driving behavior. A discussion on each classification is provided with a focus on the dominant mechanisms thought to be involved. The proposed overview gives insights into the scope of the problem and paves the way for grasping the major contributions and shortcomings in the state-of-the-art research.

Index Terms — Driving behavior; Driving measures; Driving Studies; Detection models; Prediction models.

Vanishing Point Detection under Foggy Weather with Edge-based Approach

Salma Alami and Abdelhak Ezzine
National School of Applied Sciences ENSAT, Lab. of Information and Communication Technology LabTIC, Tanger, Morocco
alami.salmaa@gmail.com

Abstract— Vanishing Point detection is one of the vision-based approaches used for autonomous vehicles and Driver Assistance Systems DAS. It is principally useful for detecting the road needed in vehicle navigation and tracking. Like other methods based on vision, the vanishing point detection approach is deeply sensitive to the presence of bad weather as fog. In this paper, we present an efficient edge-based approach for detecting the vanishing point of road scene under foggy weather based on a combination of an adaptive Canny method for edge detection, and the Hough Transform for straight line extraction. The optimal vanishing point is estimated by applying a k-mean clustering on the candidate points obtained by the straight lines intersection. We tested our approach on 731 real and synthetic images, where the experimental results show that the proposed approach for detecting the vanishing point under foggy weather gives a good result.

Index Terms — vanishing point detection; edge-based; bad weather; fog; driver assistance

Machine learning dynamic hybrid model for logistic supplying chain: assortment setting in Fast Fashion retail

Naila Fares[1], Maria Lebbar[1,2] and Najiba Sbihi[1], and Anas EL Boukhari EL Mamoun[3]

[1]Analysis and modeling of smart systems laboratory. Mohammadia Engineering School, Rabat, Morocco

[2]Mines National Superior School of Rabat, Morocco

[3]Nutek startup Company, Tangier, Morocco

Naila.fares@gmail.com, lebbar@enim.ac.ma, sbihi@emi.ac.ma

anb.elboukhari@gmail.com

Abstract— Data science tools have been used in many fields as effective techniques for data analysis. Artificial intelligence, machine learning and deep learning made the buzz on both industrial and scientific communities, pushing the researchers to search for the potential value added they might have by using the tool. Fast fashion retailers joined the vague too, but still have many untapped fields to work on. In this paper, we work on the assortment problem for a worldwide fast fashion retailer, who sells a large quantity of products, with a wide range of models and different regions of sales; every region has its own features in term of habits, clothing choices and trends, thus the retailer uncertainty to dispatch its inventory in an optimal way, as to meet the expectations of the customers, building the consumers loyalty and maximize the sales. The proposed procedure is programmed with Python and tested with data instances, inspired from real cases.

Index Terms —Fast fashion, retail, assortment problem, machine learning, data science, algorithm, supply chain

A customer profiling machine learning approach, for in-store sales in Fast Fashion retail

Naila Fares[1], Maria Lebbar[1,2] and Najiba Sbihi[1]

[1]Analysis and modeling of smart systems lab. Mohammadia Engineering School, Rabat, Morocco

[2]Mines National Superior School of Rabat, Morocco

Naila.fares@gmail.com, lebbar@enim.ac.ma, sbihi@emi.ac.ma

Abstract— In the last few decades, fast fashion retailers competitiveness is highly increasing, to get the market shares. With few historical data, the data analysis is a real challenge in this field. From the other hand, the customer service focus is a must, since the expectations of consumers are extremely selective. In this context, data science and machine learning tools are the latest trend in big data analysis, with short calculation time, that attract leader from many sectors to test their abilities in problem solving. This paper is a contribution to a machine learning based procedure, for customer profiling in fast fashion retail. It helps to build linking rules, of customers and their choices. Results will be a support in customer assistance, for increasing the in store sales basket size.

Index Terms —Fast fashion, retail, customer profiling, machine learning.

Designing CBR-BDI Agent for Implementing Reverse Logitics System

Fatima Lhafiane, Abdeltif Elbyed and Mouhcine Adam
LIMSAD Lab., Hassan II Univ., FS, Casablanca, Morocco
{lhafianefatima, mouhcineadam1}@gmail.com,a.elbyed@fsac.ac.ma

Abstract— Over a few last decades, the enterprises make a great effort to avoid the risk of losing competition and strive to respond precisely to the customer return demands by improving their flexibility and agility, while maintaining productivity and quality. Reverse logistical (RL) activities including all operations that seize products from their final destination and bring them back to their origin in the purpose of recapturing value, recycling or disposing the returned products can be quite complex to manage due to dynamicity and uncertainty in demand. Thus, to deal with these issues we propose a Belief-Desire-intention (BDI) agent modeling which performs the reverse logistics decision process. The use of intentional or (BDI) agent is uncomplicated and its decision process is quite easy to understand, but Nevertheless its inability of learning from the environment remains the main problem faced in the development of this kind of intelligent agent. To solve this problem our (BDI) agents utilize the features of case-based reasoning (CBR) in order to improve the agent capabilities of learning from environment and to take the best decision about returned product based on the previous cases. The agent system design was implemented in Jason open source agent programming platform and the CBR system was designed using jCOLIBRI design tools.

Index Terms —reverse logistics; intelligent agent; BDI agent; case-based reasoning; CBR-BDI agent.

Quadrotor flight simulator modeling

Yasmina Benmoussa[1], Anass Mansouri[2] and Ali Ahaitouf[1]
[1]Renewable Energy and Smart Systems Lab., FST, Sidi Mohammed Ben Abdellah Univ. Fez, Morocco
[2]Renewable Energy and Smart Systems Laboratory National School of Applied Sciences, Sidi Mohammed Ben Abdellah University, Fez, Morocco
{lhafianefatima, mouhcineadam1}@gmail.com,a.elbyed@fsac.ac.ma

Abstract— Quadrotor is one of the most active research topic in rotary wing unmanned aerial vehicles due to its mechanical design simplicity and human interaction safe characteristic. The purpose of this work is to build a software flight simulator for quadrotor system, and to display all the trajectory tracking details. The simulator was built by modelling the dynamic model of quadrotor in a software platform. The paper presents several simulation results of the quadrotor dynamics in three flight directions. The simulator results show the stable performance of the PID (Proportional-Integral-derivative) controller being used.

Index Terms —Drone; quadrotor; PID controller; flight simulator

A parallel approach to optimize the supply chain management

Otman Abdoun, Yassine Moumen, and Ali Daanoun
Department of Computer Science, Polydisciplinary Faculty
Abdelmalek Essaadi Univ., Larache, Morocco

Abstract— The worldwide economic progression in the last century and the Demographic growth has given rise to a huge consumption in the market of goods and services, while globalization decreased the cost of shipping and transportation. The production, transportation, storage and consumption of all these goods, however, have created big environmental problems. Nowadays, global warming, created by large-scale emissions of greenhouse gasses, is a top environmental concern. In this matter, the number of organizations planning to integrate the environmental practices into their future strategic plans is continuously increasing to counter this threat. The environmental benefits of the trend are clear: fewer vehicles burning fuel, crowding urban streets, and taking up valuable parking areas. However, the problem with transportation is that it can be so difficult to choose the perfect path for the vehicle to take if there is many stops to be taking in consideration. Due to the complexity of real world problems, such as supply chain management, finding a good path for vehicles with traditional ways (by using human capabilities) require a long time to satisfy all constraints. Even with machines, this particular problem needs a huge computational power (in term of processing power and memory usage) as well as time to solve. Actually, Parallelism is an approach that not only reduce the resolution time but also improve the quality of the provided solutions. The purpose of this paper is to evaluate the Travelling Salesman Problem (TSP) as a function of forming and optimizing transport networks using an efficient parallelization strategy for the Ant Colony Optimization (ACO) taking the maximum advantage of the parallel architecture offered by NVidia's Graphics Processing Units (GPUs).

Index Terms — GPU, Parallel Ant Colony Optimization, Sequential Ant Colony Optimization, Travelling Salesman Problem, CUDA

Image analysis by Hahn moments and a digital filter

Hicham Karmouni[1], Tarik Jahid[1], Mhamed Sayyouri[2], Abdeslam Hmimid[1], Anass El Affar[1] and Hassan Qjidaa[1]

[1]FS Dhar El-Mehraz, Sidi Mohamed Ben Abdellah Univ., Fez, Morocco

[2]National School of Applied Sciences, Chouaib Doukkali Univ., El Jadida, Morocco

hicham.karmouni@usmba.ac.ma , jahidtarik@gmail.com , mhamed.sayyouri@usmba.ac.ma , abdeslam.hmimid@usmba.ac.ma , anass.dido@yahoo.fr , qjidah@yahoo.fr

Abstract— In this paper, we propose a new method of the fast and stable computation of the discrete orthogonal moments of Hahn. In this method, we have combined two main concepts. The first concept is the digital filters based on the Z-transform to accelerate the calculation process and their inverses of the Hahn moments. The second concept is the partitioning of the image into a set of blocks of fixed sizes where each block is processed independently. The first concept to accelerate the computation time and the second to improve the quality of images reconstruction. Experimental results show that both the proposed algorithms to compute Hahn moments and inverse perform better than existing methods in term of computation speed and the quality of images reconstruction.

Index Terms — Hahn moments, Image reconstruction, Lapped block-based method.

A new langage for adaptatif system
Structured Decision Network Language (SDNL)

Soumaya EL Mamoune, Mostafa Ezziyyani, Maroi tsouli fathi
Faculty of Science and Technology/ computer science, Tangier, Morocco
soumayamgi@gmail.com , ezziyyani@gmail.com , maroi.tsouli@gmail.com

Abstract— Based on adaptatif system and decision theory, this paper introduces a new language to manage Decision Network for proposing services to a dynamic event after an adaptation. The new approach presents several solutions to critiques situations but the most problem was how we can manage and structure the decisions in the database. To solve this problem, we propose a Structured Decision Network Language (SDNL) to define all the operations that can be used like add a decision, update, delete and link the decisions. The new language is some instructions to execute for having some operations. The main objective of this article is to present the new language and the instruction of this language. We also propose a case study on which we apply the instructions of the language. For that, we suggest a network for the managements of accidents during pilgrimage and we take part of the network to show how to construct a network decision by the language SDNL.

Index Terms — SDNL, Decision Network, adaptation, Network Management, structured language, network evolution.

A fuzzy logic guided genetic algorithm to solve the full truckload vehicle routing problem with profit

El Bouyahyiouy Karim and Bellabdaoui Adil

TIME – Technologies d'Information et Management des Entreprises, ENSIAS - Mohammed V Univ., Rabat, Morocco

karim.bouyahyaoui2015@gmail.com, adil.bellabdaoui@um5.ac.ma

Abstract— This paper proposes a genetic algorithm to solve the full-truckload selective multi-depot vehicle routing problem under time windows constraints (denoted by FT-SMDVRPTW). The objective is to construct a solution composed of a set of routes associated with the trucks, aiming at maximizing the total profit. Each route is a sequence of selected orders to serve so that the operational constraints are respected. Our problem appears clearly when the vehicles return buck. It is not obligatory to serve all orders. Only the ones that guarantee a better profit are selected. We adopt an algorithm named FTGA to solve the FT-SMDVRPTW using combination of genetic algorithms search and fuzzy logic technic to adjust the crossover and mutation rate. Finally, we give a numerical example on a randomly generated instance to illustrate our approach.

Index Terms — vehicle routing problem; time windows; multi depots; full truckload; profit; genetic algorithm, fuzzy logic

Sorting Decisions in Group Decision Making

Djamila Bouhalouan, Mohammed Frendi, Abdelkader Ould-Mahraz and Abdelkader Adla
Depart. of Computer Science, Univ. of Oran 1, Ahmed Ben Bella
Oran, Algeria
karim.bouyahyaoui2015@gmail.com, adil.bellabdaoui@um5.ac.ma

Abstract— In the group decision making process, the alternatives amongst which a decision must be made can range from a few to a few thousand; the decision makers need to narrow the possibilities down to a reasonable number and categorize and classify alternatives. Even when this is not the case, decision support approaches such as ontology-based frameworks potentially offer these capabilities and can assist the decision-makers in presenting the alternatives in a form

Index Terms — Group decision making, GDSS, ontology, OWL

A Comparative Study of Vehicle Detection Methods

Sara Baghdadi and Noureddine Aboutabit
IPOSI lab., National School of Applied Sciences, Hassan 1st Univ., Settat, Morocco
sara92.baghdadi@gmail.com , noureddine.aboutabit@uhp.ac.ma

Abstract— Our project aims to tackle one of the most famous violation on the road; when a vehicle crosses to the wrong side of the road to overtake another vehicle traveling in the same direction. So, we aim to develop a computer vision system to detect robustly the prohibited overtaking observed from a static camera. Our approach is based on two main stages: Line Detection and Vehicle Detection. For each stage, several techniques can be used. In the presented work, we will focus on vehicle detection stage. Here, features are extracted from image and then classified using machine learning algorithms such as SVM (Support Vector Machines), kNN (K-nearest neighbor) and Decision Tree. We used two different kinds of features HOG (Histogram of Oriented Gradient) and SURF (Speeded up Robust Features) and we constructed different combinations for vehicle detection. Finally, various parameters are calculated to evaluate the performance of each algorithm used in order to carry out a comparative study. The experiments reveal that the results vary according to each combination.

Index Terms — Overtaking prohibited, Vehicle Detection, HOG, SIFT, SURF, SVM, KNN, Decision Tree

A Lightweight Ciphertext-Policy Attribute-Based Encryption for Fine-Grained Access Control

Hassan El Gafif, Naima Meddah and Ahmed Toumanari

Lab., (LISTI), ENSA, Ibn Zohr University, Agadir, Morocco

hassan.elgafif@edu.uiz.ac.ma

Abstract— With the expansion of data, companies start to look for new efficient and cheap alternatives to store, share and manage their data. In this regard, cloud storage services appeared to fill this gap by providing a huge amount of computing resources ensuring data availability and efficient data management with low cost due to the pay-as-you-go payment model adopted by cloud providers. However, by outsourcing their sensitive data (financial data, health records …), companies will no longer be in control of them, so this arises big challenges related to the confidentiality and data security against attackers (in case of compromised cloud servers) and even against curious cloud providers. Therefore, encrypting data before outsourcing them is the only way that gives to the data owners the control over their data. However, using traditional public key cryptography in a data sharing context produces an unnecessary communication and computation overhead since for each targeted user, the data owner needs to encrypt a copy of data with the corresponding user's public key. To fix this problem, many attribute-based encryption (ABE) schemes were proposed. In the ABE model, the encryption process is done based on the attributes instead of a unique public key, and users with matching attributes can decrypt the ciphertext, so data owners in this model don't need to generate many copies of the same data as in the traditional cryptosystems. However, these schemes still require a huge computational power and communication cost since they are based on expensive bilinear pairing and modular exponentiation operations. We propose a lightweight version of the Ciphertext-Policy Attribute-Based Encryption (CP-ABE) using elliptic curve cryptography and scalar point multiplications, instead of bilinear pairings and modular exponentiations, to ensure a fine-grained access control with less computation cost and shorter keys and ciphertexts. The results show that our scheme improves the execution efficiency and requires a low-cost communication and storage.

Index Terms — Cloud Computing; Fine-grained access control; Elliptic Curve Cryptography; Attribute-Based Encryption

Android Applications analysis results using PerUpSecure Tool

Er-Rajy Latifa, Ahmed El Kiram and Mohamed El Ghazouani
Dept. of Computer Sciences, University Cadi Ayyad, Marrakesh, Morocco
errajy.latifa@gmail.com, Mohamed.elghazouani63@gmail.com

Abstract— Since its introduction in 2008, Google's Android has been a blazing success, far outstripping the market share of all other mobile operating systems. Android ships more than one billion new devices each year, and more than 1.5 million new devices are activated every day. This growth was not without pain, however. Recent measures estimate that 96-97% of today's mobile malware targets the Android operating system, and 73% of them are specifically designed to satisfy profit motives. In addition, as the system becomes more popular and scrutinized, the number of vulnerabilities identified has exploded. The security of Android is a key issue for Google, the mobile OS is - by far - the most popular in the world. The Android security mechanism is founded on an instrument that gives users all the information about the permissions requested by the application before installing it. The main benefit of this Android permission system is to provide users an overview of the application by showing them the requested permissions list, which can help raise awareness of its risks on their private data. However, we still do not have enough information to allow us to say that standard users are able to clearly understand the permissions requested and their implications for their security. In this article, we present a tool called "PerUpSecure" multiphases that combines dynamic and static analysis and contrary to what we know about the installation process of Android applications that puts in front of the user only two options, either he accepts all requested permissions or he cancels the installation, our proposed tool allows the user to install any application with only the necessary permissions. At the end of this article, we present the analysis results of a set of normal applications and malicious programs collected from different markets.

Index Terms — Android; Permissions; Applications; Security; Tool

Datamining For Fraud Detecting, State of the art

Imane Bouazza[1], El Bachir Ameur[1] and Farid Ameur[2]

[1]LaRIT Laboratory, FS, Ibn Tofail Univ., Kenitra, Morocco

[2]Tax Depart., Ministry of Economy and Finance, Rabat, Morocco

Imanebouazza18@gmail.com, ameurelbachir@yahoo.fr, ameur_farid@yahoo.fr

Abstract— Fraud detection is a rapidly developing field; several technologies have been used to prevent fraud such as data mining (DM). The use of data mining applications has shown their utility in different fields and have attracted increasing attention and popularity in the financial world. Data mining plays an important role in the field of fraud because it is often applied to extract and discover the truths hidden behind very large amounts of data. For this purpose, our contribution explores the applications of data mining techniques to fraud detection, and groups the various researches carried out in this field from 1966 to 2017. The result of this study will support and guide future research in this field.

Index Terms — Datamining, fraud detection, intelligent system.

Ant Colony Optimization for Cryptanalysis of Simplified-DES

Hicham Grari, Ahmed Azouaoui and Khalid Zine
LAROSERI Lab., Chouaib Doukkali University, FS, El Jadida, Morocco
grari.hicham@gmail.com, azouaoui.a@ucd.ac.ma, zinedine@ucd.ac.ma

Abstract—Ant Colony Optimization is a search meta-heuristic inspired by the foraging behavior of real ant, having a very wide applicability. Especially, it can be applied to different combinatorial optimization problem. In this paper, we present a novel Ant Colony Optimization (ACO) based attack for cryptanalysis of Simplified Data Standard Encryption (S-DES). A known Plaintext attack is used to recover the secret key requiring only two Plaintext-Ciphertext pairs. Moreover, our approach allows us to break S-DES encryption system in a minimum search space when compared with other techniques. Experimental results prove that ACO can be considered as a convincing tool to attack the key used in S-DES.

Index Terms — Cryptanalysis, ACO, S-DES, Pheromone.

Elephants Herding Optimization for Solving the Travelling Salesman Problem

Anass Hossam, Abdelhamid Bouzidi and Mohammed Essaid Riffi
LAROSERI Lab., Chouaib Doukkali University, FS, El Jadida, Morocco
anass.hossam@gmail.com, mr.abdelhamid.bouzidi@gmail.com, said@riffi.fr

Abstract—This paper proposes a novel metaheuristic called Elephant Herding Optimization (EHO) to solve the Travelling Salesman Problem (TSP) which is a combinatorial optimization classified as NP-Hard. The EHO algorithm is bio-inspired real behavior of the herding of elephant's groups, which proved its efficiency to solve the continued optimization problem. So, to extend the application of this algorithm, we had proposed a novel adaptation of the EHO by respecting the based real life. To test the efficiency of our proposal adaptation, the EHO was applied to solve some benchmark instances of TSPLIB. The result shows the performance of the novel proposal method.

Index Terms — Travelling salesman problem; Elephants Herding Optimization; combinatorial optimization; metaheuristic; nature-inspired

The Discrete swallow swarm optimization for flow-shop scheduling problem

Safaà Bouzidi[1], Morad Bouzidi[1], Mohammed Essaid Riffi[1] and Mohammed Mouçouf[2]

[1]LAROSERI Lab., Chouaib Doukkali University, FS, El Jadida, Morocco

[2]Depart. of Mathematics, Chouaib Doukkali Univ., El jadida, Morroco

sfbouzidi@gmail.com, mrbouzidi@gmail.com, said@riffi.fr, moucouf@hotmail.com

Abstract—The flow-shop scheduling problem is a well-known problem in production system. The objective is minimizing the total time it takes to process the entire job called makespan. In order to solve this NP-hard problem, we approve a new adaptation approach based on the intelligent behaviors of swallows, it is the discrete swallow swarm optimization algorithm (DSSO) present a recent metaheuristic method used to solve a combinatorial problem. The proposed algorithm is tested on different benchmarks instances and compared with the recently proposed efficient algorithms. The results demonstrate that the proposed algorithm is more efficient than the other compared algorithms. It can be used to solve large instances of flow shop scheduling problem effectively.

Index Terms — Swallow Swarm Optimization algorithm; Combinatorial problem; Metaheuristic; flow-shop scheduling problem; Makespan

Improved cat Swarm optimization to Solve The Traveling Salesman Problem

Abdelhamid Bouzidi[1] and Mohammed Essaid Riffi[2]

[1]Computer Science, CRI-ISGA, El Jadida, Morocco

[2]LAROSERI Lab., Chouaib Doukkali University, FS, El Jadida, Morocco

mr.abdelhamid.bouzidi@gmail.com, said@riffi.fr

Abstract—The Travelling Salesman Problem (TSP) is a known optimization problem by giving the important number of its application and its complexity (classified as NP-hard combinatorial optimization). That explains the important number of the proposed metaheuristics by using the computational intelligence to solve it, and also it needs to be improved. This paper aims; propose a novel improved of a nature-inspired behavior based the real life of cat, called Cat Swarm optimization (CSO) to solve the TSP. The result of the first CSO adaptation to solve the TSP (proposed in 2013) show that it needs more improvement. That's is why this paper propose a novel improved CSO is based a dynamic Mixture Ratio used to exchange the mode of the cat (Seeking or tracing mode). The results application of the proposed methods to solve some benchmark instances of TSPLIB; show that the novel proposal method is more efficient.

Index Terms — TSPt; Cat swarm optimization; computational intelligence; combinatorial optimization; Mixture ration

Code Verification used TPM solutions for the Internet of Things Platforms

Toufik Ghrib[1], Mohamed Benmohammed[2], Abdelkader Hadj Seyd[1] and Abdelkader Guezzi[3]

[1]Depart. of Production of Hydrocarbons, Faculty of Hydrocarbons, Renewable Energies, Earth Sciences and the Universe. Univ. of Kasdi, Merbah, Ouargla

[2]Department of Software Technologies and, Information Systems Faculty of New Technologies of Inf. and Communication, Univ. of Constantine, Constantine, Algeria

[3]Laboratory Génie Electrique, Univ. of Kasd, Merbah,Ouargla, Algeria

gharib.toufik2006@gmail.com

Abstract—Today's Internet of Things (IoT) is achieving more and more importance, since networks of physical objects embedded with electronic components, software and sensors are gaining popularity. The connectivity of such objects becomes crucial for the services and functionalities provided by the Internet of Things, which can be used for a great range of purposes: a network of cars sharing traffic information, a network of medical services, etc. more applications require the use of embedded code. This code usually exchanged in a pre-compiled form (bytecode), can be naturally the product of the compilation of a source program written in a given language (smart cards, ...), but can also be of a unknown source (network games, hackers, ...). It is therefore appropriate, before running it, to make sure it is free of errors and that its execution on the host platform will not affect the proper functioning, both in terms of the calculation time and the level of the memory resources used. We are interested here in different techniques and methods to specify and to verify the veracity of the code exchanged between the different machines, in this case, we have to focus in two different sources of action: Device authentication: to ensure that any device can be replaced by a fake one and Software state attestation: to ensure that the current software state matches the system state. The way to address this issue is through trusted elementbased TPM solutions.

Index Terms — Internet of Things; Security; Embedded Systems; Verification; TPM.

Improving the security communication in intelligent distributed systems based on Mobile Agent

Sanae Hanaoui, Yousra Berguig and Jalal Laassiri

[1]Informatics Systems and Optimization Lab., Ibn Tofail University, FS, Kenitra Morocco

sanae.hanaoui@uit.ac.ma, yousra.berguig@gmail.com, laassiri@uit.ac.ma

Abstract—Mobile agent a new technology that satisfies the requirements of intelligence in distributed systems; also, it's a paradigm that accepts networking and distribution as a basic concept. But this it's still lacking when it comes to security which is a very important concept in the growth and development of this technology. In this paper we investigate the security of the distributed mobile agent system. We will present its benefits and we propose a new approach to improve the security of mobile agent communication while its migration, to grant the security agent, data, code and its environment.

Index Terms — Mobile Agents; Network Security Protocol; Security Mechanisms; communication; cryptography

Optimization of Makespan in Job Shop Scheduling Problem by Hybrid chicken swarm algorithm

Soukaina Cherif Bourki Semlali[1], Mohammed Essaid Riffi[2] and Fayçal Chebihi[2]

[1]LAMAPI Lab., Depart. of Maths, FS, Univ. of Chouaib Doukkali, El Jadida, Morocco

[2]LAROSERI Lab., Department of Computer Sciences, FS, Univ. of Chouaib Doukkali, El Jadida, Morocco

Soukaina.cherif.b.s@ucd.ac.ma , Saidriffi2@gmail.com , Chebihi.f@ucd.ac.ma

Abstract—This paper presents an adaptation of a new metaheuristic called Chicken swarm optimization with simulated annealing (CSOSA) to solve the job shop scheduling problem (JSSP). The objective is to optimize the makespan by involving chicken swarm algorithm which take into consideration the behavior and the hierarchical order of chicken swarm while seeking for food. The performance of the proposed algorithm is enhanced with a hybridization of CSO with simulated annealing (SA). Furthermore, we propose to integrate the pair-exchange method which is used on each machine to improve the solution quality. The empirical results are obtained by applying the new algorithm on some instances of OR-Library. The computational results demonstrate the effectiveness of the CSOSA comparing to other existing metaheuristics from literature in term of quality of solution and run time for the various benchmark.

Index Terms — Chicken swarm optimization ; OR-Library ; Combinatorial optimization ; Simulated Annealing ; 2-opt neighborhood ; Makespan

Artificial Neural Network optimized by Genetic Algorithm for intrusion detection system

Mehdi Moukhafi[1], Khalid El Yassini[1], Bri Seddik[2] and Kenza Oufaska[3]

[1]Informatics and Applications Lab., Depart. of
Mathematics and Computer Sciences, FS, Moulay Ismail Univ., Meknes, Morocco

[2]Materials and Instrumentations (MIN), Depart. of
Electrical Engineering, ESTM, Moulay Ismail, Univ., Meknes, Morocco

[3]Faculty of Computer Science and Logistics, International, Univ. of Rabat, Rabat, Morocco

mehdi.moukhafi@gmail.com , khalid.elyassini@gmail.com, briseddik@gmail.com ,
Kenza.oufaska@uir.ac.ma

Abstract—Intrusion detection systems (IDS) have emerged as a group of methods that combats the unauthorized use of a network's resources. Recent advances in information technology, specially in machine learning, have produced a wide variety of methods, which can be integrated into an IDS. This paper presents a technique of intrusion detection based on pre-treatment of data set and classification intrusions with a Self Organizing Map (SOM) Artificial Neural Network method optimized with Genetic algorithm (GA) to develop a model for intrusion detection system. The simulation results show a significant improvement in detection rate. The performance of the proposed method of intrusion detection was evaluated on all UNSW-nb15 and KDD99 data sets.

Index Terms — Anomaly Intrusion Detection System (IDS); machine learning Based Intrusion Detection; Self Organizing Map (SOM); Neural Network; Genetic Algorithm; KDD9;UNSW-nb15

An Effective Parallel Approach to Solve Multiple Traveling Salesmen Problem

Otman Abdoun[1], El Khatir Haimoudi[1], Rahfal Mohsin[1] and Mostafa Ezziyyani[2]

[1]Computer Science Depart., Lab. of Advanced, Science and Technologies, Polydisciplinary Faculty, Univ. UAE, Larache, Morocoo

[2]Mathematics and Application Lab., FST, Univ. UAE, Tanger, Morocco

abdoun.otman@gmail.com , helkhatir@gmail.com , muhsiine@gmail.com , ezziyyani@gmail.com

Abstract—The evolution of computing and the appearance of the parallel architecture pushed the world to reconsider all the existing algorithm and enhance their performance given the impact that parallel programing could do to improve the performance. And its worth to be tried on NP-Complete problems such as TSP and its variants. The traveling salesman problem (TSP) is a famous combinatorial optimization problem where a salesman must find the shortest route to n cities and return to a home base city. While the TSP restricts itself to one salesman, the mTSP generalizes the problem to account for more than one salesman. A natural approach for solving this kind of problems is to group the cities in clusters where each cluster represent a set of adjacent cities then to use one of the well know optimization, approaches for finding the optimal path route for each cluster we have. In this paper we introduce theAnt colony optimization algorithm, and also Ag method to solve the mTSP problem using sequential and parallel programming. and then we combine the two approaches and construct a robust hybrid algorithm.

Index Terms — TSP, MTSP, Ant Colony, Genetic Algorithm, parallel, multithread, multiprocess

Resolving Multiple Sequence Alignment Problem Using Metaheuristics

Lamiche Chaabane
Depart. of computer science, Mohamed Boudiaf Univ., M'sila, Algeria
lamiche07@gmail.com

Abstract—In this work, a novel hybrid model called PSOSA for solving multiple sequence alignment (MSA) problem is proposed. The developed approach is a combination between particle swam optimization (PSO) algorithm and simulated annealing (SA) technique. In our PSOSA approach, PSO is exploited in global search, but it is easily trapping into local optimum and may lead to the premature convergence. SA is incorporated as local improvement approach to overcome local optimum problem and intensify the search in local regions to improve solution quality. Numerical results on BaliBASE benchmark have shown the effectiveness of the proposed method and its ability to achieve good quality solutions comparing to those given by other existing methods.

Index Terms — hybrid model; multiple sequence alignmen; PSO; SA; neighborhood generation; BaliBASE benchmark

The Immigration Genetic Approach to Improve the Optimization of Constrained Assignment Problem of Human Resources

Said Tkatek[1], Otman Abdoun[2] and Jaaffar Abouchabaka[1]

[1]LaRIT, Faculty of Sciences, Ibn Tofail University Kenitra, Morocco

[2]Polydisciplinary Faculty, Abdelmalk Essaadi University, Larache, Morocco

saidtkinfo@yahoo.fr, otman.fpl@gmail.com, abouchabaka.depinf@gmail.com

Abstract—In this work, we are interested to propose a new genetic approach to improve the optimal solution of a constrained assignment problem of human resources within the multi sites enterprise. By taking into consideration various constraints, this problem can be defined as a NP-hard combinatorial problem. In this work, we have developed the mathematical formulation of this problem and proposed a genetic approach to the search for an optimal solution, but we have noticed that the phenomenon of stagnation of this proposed genetic algorithm persists although increases in the number of iterations lead to a significant consumption of computing time and memory space. To remedy this problem, we propose in this paper to integrate new genetic methods, such as Standard Immigration Genetic (SIG), able of improving the convergence towards the optimum. This process is based on the insertion of a percentage of best individuals from previous generations in the genetic population to improve the diversity of the population and to bias the search direction for obtaining the best solution. The results are being evaluated and compared with other results obtained using the last proposed genetic approach.

Index Terms — Assignement, Human Resources, Optimization, Hard Problem, Stagnation, Improvement, Genetic algorithm, Immigration

Security Analysis in the Internet of Things: State of the Art, Challenges, and Future Research Topics

Karim Ennasraoui[1], Youssef Baddi[1,2], Younes El Bouzekri El Idrissi[1] and El Mehdi Baa[1]

[1]Systems Engineering Lab.,

National School of Applied Sciences of Kenitra (ENSAK), Ibn Tofail Univ. Kenitra, Morocco

[2]STIC Laboratory, ESTSB School, Chouaib Doukkali University, El Jadida, Morocco

karim.ennasraoui@gmail.com , baddi.y@ucd.ac.ma , y.elbouzekri@gmail.com , aba.elmehdi@gmail.com

Abstract—Internet of Things is a big new technology that will make new future concepts and technologies. The work of this paper is to a brief survey security analysis in the internet of things. We provide an overview and discusses a qualitative way the recent development of the most relevant security field in the context of the internet of things (IoT). It outlines the key characteristics of the security analysis and summarizes various representative studies for IoT, including Blockchain. An important focus is the inclusion of how value is extracted from the security in the IoT. We also discuss some recent techniques for the existing activities and future opportunities related to the security in the internet of thing, outlining some of the key underlying issues that need to be tackled.

Index Terms — Internet of Things; Security; Blockchain; Privacy; Trust

Steganographic Algorithm based on Adapting Secret Message to the Cover Image

Youssef Taouil, El Bachir Ameur
LaRIT Laboratory, Computer Sciences Depart., FS, Ibn Tofail Univ.
Kenitra, Morocco
taouilysf@gmail.com , ameurelbachir@yahoo.fr

Abstract—Steganography is the art of dissimulating secret data into digital files in an imperceptible way that does not arise the suspicion; it is one of the techniques that enter into the field of information security. In this paper, a steganographic method based on the Faber-Schauder discrete wavelet transform is proposed, the embedding of the secret data is performed in the Least Significant Bits of the integer part of the high frequency coefficients. The secret message is decomposed into packets of K bits, and then each packet is transformed into another packet based on a permutation that allows obtaining the most matches possible between the message and the K-LSBs of the coefficients. To assess the performance of the proposed method, experiments were carried out on a large set of images, and a comparison to prior works is accomplished. Results show a good level of imperceptibility and a good trade-off imperceptibility-capacity compared to literature.

Index Terms — steganography; data hiding; Faber-Schauder DWT; permutation; least significant bit

A Honey Net, Big Data and RNN Architecture for Automatic Security Monitoring of Information System

Alaeddine Boukhalfa, Nabil Hmina and Habiba Chaoui
ADSI Team, System Engineering Laboratory, National School of Applied Sciences
Kenitra, Morocco
alaeddine.boukhalfa@gmail.com , hmina@univ-ibntofail.ac.ma, mejhed90@gmail.com

Abstract—The security monitoring of the information system represents a major concern for organizations. Attackers can use multiple and different ways to harm or abuse system resources, this variety of attacks raises issues related to how to treat it. In addition, these attacks can evolve and be undetectable by the existing methods of security. To solve these problems, we propose, in this paper, the implementation of an automatic security monitoring system of the information system, based on exposing Honeypots and collecting data of attacks from them, storing the variety of attacks using Big Data techniques, and processing and analyzing them by Recurrent Neural Network (RNN) which is a Deep Leaning method, in order to extract knowledge from these threats and face the others unknown similar.

Index Terms — NIDS; security monitoring; Big Data; Deep Learning; RNN; Honeypot

Model-based security implementation on Internet of Things

Yasmina Andaloussi and Moulay Driss El Ouadghiri
IA Laboratory, FS, University of moulay ismail, Meknes, Morocco
andyasmina@gmail.com, dmelouad@gmail.com

Abstract—The explosion in the number of smart, connected and insecure devices is changing the paradigm of security, security vulnerabilities and attacks have been increased over the last few years. Currently, myriad of nodes and smart objects are connected to each other to create smart grids and infrastructures. These environments compromise our intimate and private information about our health, our location and our business. To combat the risk to intercept our communications and compromise our privacy, research investments in security fields is steadily increasing and various security models, approaches and frameworks have been proposed. This article examines the evolution of security in the context of the Internet of Things. It proposes a secure scenario in which authentication and secure communication are granted.

Index Terms — NIDS; security monitoring; Big Data; Deep Learning; RNN; Honeypot

Immune based genetic algorithm to solve a combinatorial optimization problem

Ahmed Lahjouji El Idrissi[1], Chakir Tajani[2], Imad El Karkri[2] and Hanane Fakhouri[2]

[1]Dept. of Mathematics FS, Moulay Ismail University Meknes, Morocco

[2]Dept. of mathematics FP, Abdelmalek Issaadi University Larache, Morocco

idrissila@gmail.com , chakir_tajani@hotmail.fr, chal.imad@gmail.com, ananef@gmail.com

Abstract—We are interested in improving the performance of genetic algorithm (GA) to solve a combinatirial optimization problem. Several approaches have been developed based on the adaptation and improvement of different standard genetic operators. However, GA also has some significant drawbacks, for instance, the premature convergence of computations, expensive computation from evolutional procedures, and the poor capability of local search. Artificial immune system is a class of computational intelligence methods drawing inspiration from human immune system. As one type of popular artificial immune computing model, clonal selection algorithm (CSA) has been widely used for many optimization problems. In this paper, an immune based genetic algorithm is proposed to overcome these inconvenients for traveling salesman problem us a typical combinatirial optimization problem. Numerical results are presented for different standard instances from the TSPlLIB showing the performance of the proposed algorithms.

Index Terms — clonal selection algorithm; artificial immune system; optimization; travelling salesman problem; genetic algorithm

Security and Risks for Cloud Environments

Ahmed Ziani[1] and Abdellatif Medouri[2]

[1]Information Systems and Telecommunications Lab., FST- Abdelmalek Essaadi Univ. Tetuan, Morocco

[2]Modeling and Inf. Theory Group, PFT- Abdelmalek Essaadi Univ. Tetuan, Morocco

zianiahmed@gmail.com, amedouri@uae.ma

Abstract—Cloud computing has been considered a revolutionary approach towards the computing and a promising solution to increasing demand for using resources provisioned over the Internet which becomes riskier than ever. The cloud computing is a powerful technology in IT environment to provide cost effective, easy to manage, elastic, and powerful resources over the Internet. The Cloud computing offers several advantages and conveniences for today's organizations. Personnel can work together in documents in real time from their phone or tablet from any location, and communicate instantly with teammates via video, voice, instant message, or email. Even though there are innumerable advantages to approaching the cloud computing, security standards are emerging – and constantly evolving – that directly address many of the challenges we already see today. This paper explores the key issues surrounding cloud security for providers and passes on valuable guidance about not only information security, but more broadly risk. Also, it will help providers to make informed security decisions about their diverse cloud set-ups and better understand how to reap all the benefits of cloud without compromising their organizations' security.

Index Terms — Cloud Computing, Cloud Security, Security Challenges, Risks Issues

Intrusion detection using Artificial Neural Networks and Particle Swarm Optimization

Taha Ait Tchakoucht and Mostafa Ezziyyani
Lab. IBDD-TC, FST Tangier, Univ. Abdelmalek Essaâdi, Tangier, Morocco
taha.ait@gmail.com, ezziyyanni@gmail.com

Abstract— Computers and other smart devices have become of vital in today's transactions. Associated to the Internet, those gadgets offer the possibility to benefit from multiple electronic services such as social networking, banking, trade marketing, education, … etc. These activities were producing large amounts of data transiting with high velocity during the last decade. This was accompanied by an epidemic growth in the number and the sophistication of cyberattacks, as they became more targeted and highly structured. In this perspective, modern intrusion detection systems should be designed to yield high detection rates in a small period of time, to prevent serious damages. This work proposes a network anomaly-based intrusion detection that uses Artificial Neural Network and Particle Swarm Optimization. We assess our model on two publicly available datasets namely, the DARPA KDD'99, and NSL-KDD a reformed version of the latter Performance metrics for both binary classification and multilabel classification are calculated and compared with those of some existing machine learning techniques and recent state-of-the-art intrusion detection systems. Results show competitive Detection rates in a brief processing time.

Index Terms — Intrusion Detection, ANN, Particle Swarm Optimization

Intelligent reservation systems based on MAS & data mining method

Oum Elhana Maamra and Mohamed-Khireddine Kholladi

Mathematical Department and Computer Science University El-Oeud, Algeria

hanaoumelhana@gmail.com , kholladi@yahoo.fr

Abstract— Agents primarily focus on issues from many aspects, from theoretical, methodological, and experimental to practical issues in developing agent-based computing and agent-oriented intelligent systems, which are a powerful technology for autonomous intelligent system analysis, design and implementation. The major topics of interest consist of research on individual agents, multi-agent systems (MAS), methodology and techniques, tools and applications. data mining originally focused on knowledge discovery in databases, but it has experienced a migration from data-centered pattern discovery, to knowledge discovery, actionable knowledge discovery, and currently to domain-oriented decision delivery. Data mining and its tools is becoming a ubiquitous information processing field and tools, involving techniques and researchers from many areas such as statistics, information retrieval, machine learning, artificial intelligence, pattern recognition, and database technologies. Data mining is increasingly widely tested in varying applications and domains, for instance, web mining and services, text mining, telecommunications, retail, governmental service, security, besides the emphasis of in-depth data intelligence. At first glance he trends of both fields appear that these two independent research streams have been created and originally evolved with separate aims and objectives. They used to target individual methodologies and techniques to cope with domain-specific problems and challenges in respective areas. However, both are concerned with many similar aspects and factors, such as human roles, usersystem interaction, dynamic modeling, domain factors, organizational and social factors. In fact, both areas contribute to the advancement of intelligence, and intelligent information processing, services and systems. In fact, they need each other. This is which prompted us to try to integrate the characteristics of each fields for to get intelligent and integrated booking system. The basic concepts of reservation system and management system are discussed in this paper. The proposed "intelligent reservation system that is based on a combination of multi-agents system and data mining techniques makes intelligent reservation decisions whether to accept or reject a new client's request for reservation needed services. In the first step of the proposed model. These reservation strategies are developed using integer aggregate results database (ARD) with multi-agent system, it consists of the following agents: Client Agent, Stock Agent, Agent Station, Aggregation Agent and Agent Response. We preprogrammed our system to apply data mining methods in a distributed way to retrieve information requested by Client, the result obtained is a local model of each station the latter sends to the aggregator to obtain the final model that represents the customer response. The purpose of our proposal is to reduce response time and resource consumption by storing responses in ARD.

Index Terms — multi-agent; data mining; reservation systems; intelligent reservation

Designing an IMS-LD Model for Communication Space of Learning Management System

Mohammed Ouadoud[1] and Mohamed Yassin Chkouri[2]

[1]UAE, Faculty of Sciences (FS) Lab. of Informatics, Research Operational and Statistic Applied (LIROSA) Tetouan, Morocco

[2]UAE, National School of Applied Sciences (ENSA) Lab. of the Information System and Software Engineering (SIGL) Tetouan, Morocco

mohammed.ouadoud@gmail.com , yassin.chkouri@gmail.com

Abstract—The context of this work is that of designing an IMS-LD model for communication space of a Learning Management System (LMS). Our work is specifically in the field or seeking to promote, by means of information technology from a distance. Our approach is to first think about the conditions for creating a real LMS between learners and designing the IT environment that supports this LMS. In this paper, we try to adapt the IMS-LD model with a communication model for Learning Management System based on the social constructivism. This adaptation will go through three stages. Firstly, the development of an LMS model. Secondly, the study of correspondence between the developed model and IMS-LD model and their transformation to IMS-LD model.

Index Terms — LMS, communication space, IMS-LD, eLearning platform, designing an IMS-LD model

Exploiting NoSQL Document Oriented Data Using Semantic Web Tools

Nassima Soussi and Mohamed Bahaj
Department of Mathematics & Computer Science Faculty of Science and Technologies,
Hassan 1st Univ. Settat, Morocco
nassima.soussi@gmail.com , mohamedbahaj@gmail.com

Abstract—The web has experienced a quantitative explosion of digital data handled by companies manipulating numerous heterogeneous management systems that encapsulate large web sites destined for a wide audience. In fact, some web users treat this big amount of data with NoSQL databases while others prefer to use semantic web technologies, which make the communication between the web applications a very hard aim. The previous raison has motivated us to bridge the conceptual gap between them in order to make NoSQL data machine-readable and allow web applications to exchange information easily. Our main contribution is to generate RDF format from NoSQL database model with a specific focus on MongoDB as the most used document-oriented database in order to make the NoSQL data available on the triplestores and to carry out some operations not supported by NoSQL systems.

Index Terms — NoSQL; Document Oriented Database; MongoDB; NoSQL-to-RDF; Interoperability; Mapping System

A Temporal Data Warehouse Conceptual Modelling and its Transformation into Temporal Object Relational Model

Soumiya Ain El Hayat and Mohamed Bahaj
Depart. of Mathematics & Computer Science, FST, Hassan 1st Univ., Settat, Morocco
soumya.ainelhayat@gmail.com , mohamedbahaj@gmail.com

Abstract—The Conventional data warehouses (DWs) are information repositories specialized in supporting decision making. Since the decisional process requires an analyzing of historical data, DWs systems have been increasingly feeling the need to collect temporal data for accountability and traceability reasons. On the other hand, the temporal object relational Model has been successfully used to handle and maintain past, present and future information. In this paper, we propose a Novel conceptual design for temporal data warehouse (TDW) including bitemporal data. Our solution provides a transformation method into temporal star and snowflake schemas, which incorporate features of object relational data warehouse and integrate Bitemporal data, to meet the requirement of integrating heterogeneous types of data to support decision making with an efficient manner. We have focused on the creation of a conceptual model for designing a temporal object-relational data warehouse based on UML technology and EER (Enhanced entity-relationship) model. The proposed method comprises a Meta Model using UML mechanism to express the varying time data in data warehousing applications that allow easily realizing and transforming the conceptual model into a logical design schema.

Index Terms — Data werahouse; Object Relational Model; UML; Snowflack schema;star schema; Temporal Data Warehouse; Bitemporal data, EER model.

Introducing a Traceability based Recommendation Approach using Chatbot for E-Learning Platforms

Kamal Souali[1], Othmane Rahmaoui[1] and Mohammed Ouzzif[2]
[1]RITM ESTC Lab., Hassan II Univ., ENSEM, Casablanca, Morocco
[1]RITM ESTC Lab., Hassan II Univ., EST, Casablanca, Morocco
kml.souali@gmail.com , othmane.rahmaoui@gmail.com , ouzzif@gmail.com

Abstract—For many years, the use of recommender systems has increased and reached a new level recently. These systems are widely used in different areas, as they tend to offer and provide customers with the most suitable products or items that can satisfy their needs to the best. Especially in e-learning environments, the purpose of such systems is to help students improve their learning by suggesting relevant resources and increase their knowledge through a selection of tips, hints, and tutorials. The process of recommendation considers the user's profile which is a set of preferences and interests and is based on various techniques, often combined to provide improved results. However, due to the huge amount of data, the selection process becomes more and more difficult to handle and the same items get proposed repeatedly. Traceability, on the other hand, can either mean the history or the composition of something. It is a collection of actors, actions, objects and most importantly, time. In this paper, we introduce the use and the benefits of traceability and discuss how it can enhance recommendations. We also propose a traceability-based approach for recommendations in e-learning platforms, by means of a chatbot.

Index Terms — recommendation; recommender systems; traceability; trace; e-learning; chatbot;

A Survey on RDF data store based on NoSQL systems for the Semantic Web applications

Mouad Banane, Abdessamad Belangour
Lab. LTIM, Univ. Hassan II, FS Ben M'sik, Casablanca, Morocco
mouadbanane@gmail.com , Belangour@gmail.com

Abstract—Today the Resource Description Framework (RDF) that allows computers to understand and exploit Web data becomes very much in a progressive way, as well as the amount of web data that becomes very large. The storage and efficient management of this large RDF data is a real challenge in front of the classic RDF databases called triplestore. Recently, several researches focus on storing RDF data in triplestores based on NoSQL data management systems like HBase, Cassandra, Accumulo, and Couchbase. The majority of these researches are based on HBase. This NoSQL technology that is intended to handle this phenomenon of data explosion called Big Data, provided benefits like scalability and high availability compared to traditional triplestores. In this paper, we review existing works and systems that use NoSQL databases to store massive RDF data.

Index Terms — storing RDF data; Big Data; Semantic Web; SPARQL; RDF; NoSQL

Association rules mining method of big data for e-learning recommendation system

Karim Dahdouh[1], Ahmed Dakkak[1], Oughdir Lahcen[1] and Ibriz Abdelali[2]

[1]LSI, Depart. of Mathematics, Physics, and Informatics, Sidi Mohamed Ben Abdellah Univ., FPT, Taza, Morocco

[2]High School of Technology, Sidi Mohamed Ben Abdellah Univ., Fez, Morocco

karim.dahdoh@gmail.com , ahmed.dakkak@usmba.ac.ma , lahcen.oughdir@usmba.ac.ma , a.ibriz@gmail.com

Abstract—In recent years, recommendation systems are increasingly used due to its success in several areas such as e-commerce, tourism, social networks, and e-learning. Indeed, most of the computing environment for human learning, especially the online learning platforms have very large number of learners' profiles, thousands of courses, and various educational resources. However, students often face many challenges, such as the absence of a real solution of recommendation to orientate them to take the relevant courses. In this article, we develop a course recommendation system for the e-learning platform. It aims to discover relationships between student's courses activities through the association rules mining method in order to help student to choose the more appropriate learning materials. We also focus on the analysis of past historical data of the courses enrollments or log data. The article discusses particularly the frequent item sets concept to determine the interesting rules over all database transactions. Then, we use the extracted rules to find the list of suitable courses according to the learner's behaviors and preferences. Afterwards, we implement our system using Apriori algorithm and R programming language on data from ESTenligne1 platform database of High school of Technology of Fez. Finally, the experimental results prove the effectiveness and reliability of the proposed system to increase the quality of student's decision, guide them during the learning process, and provide targeted online learning courses to meet the needs of the learners.

Index Terms — online learning; e-learning; recommendation system; big data; association rules; Apriori algorithm, R language; frequent itemset

A New Web Service Architecture for Enhancing the Interoperability of LMS and Mobile applications Using the Next Generation of SCORM

Abdellah Bakhouyi[1], Rachid Dehbi[2] and Mohamed Talea[1]

[1]LTI Lab., FS Ben M'Sik, Hassan II Univ. Casablanca, Morocco

[2]LR2I Lab., FS Aïn Chock, Hassan II Univ. Casablanca, Morocco

abdellah.bakhouyi@gmail.com dehbirac@yahoo.fr , taleamohamed@yahoo.fr

Abstract—The evolution of mobile learning has changed the way of learning. With the growing popularity of using mobile devices, mobile learning has become important in teaching and learning in education. Most m-learning services are provided by the Learning Management Systems (LMS). This article aims to design a software architecture with LMS and focuses on integrating mobile applications to improve interoperability. This architecture is being implemented for the famous open source LMS Moodle.

Index Terms — Interoperability; SOA; LMS; Moodle; M-learning; E-learning; SCORM; LRS

A hybrid machine learning approach to predict learning styles in adaptive e-learning system

Ouafae El Aissaoui[1], Yasser El Alami El Madani[2], Lahcen Oughdir[1] and Youssouf El Allioui[3]

[1]LSI, Polydisciplinary Faculty-Taza, Univ. of Sidi Mohammed Ben Abdellah Taza, Morocco

[2]ENSIAS, Mohammed V Univ., Agdal, Rabat, Maroc

[3]LS3M, Polydisciplinary Faculty of Khouribga, Hassan 1st Univ., Khouribga, Morocco

ouafae.elaissaouil@usmba.ac.ma, yassern1@gmail.com, lahcen.oughdir@usmba.ac.ma, youssouf.elallioui@uhp.ac.ma

Abstract—The increasing use of E-learning environments by learners makes it indispensable to implement adaptive e-learning systems (AeS). The AeS have to take into account the learners' learning styles to provide convenient contents and enhance the learning process. Learning styles refer to the preferred way in which an individual learns best. The traditional methods detecting learning styles (using questionnaires) present many limits, as: 1) the time-consuming process of filling in the questionnaire and 2) producing inaccurate results because students aren't always aware of their own learning preferences. Thus, in this paper we have proposed an approach for detecting learning styles automatically, based on Felder and Silverman learning style model (FSLSM) and using machine learning algorithms. The proposed approach is composed of two parts: The first part aims to extract the learners' sequences from the log file, and then using an unsupervised algorithm (K-means) in order to group them into sixteen clusters according to the FSLSM, and the second part consists in using a supervised algorithm (Naive Bayes) to predict the learning style for a new sequence or a new learner. To perform our approach, we used a real dataset extracted from an e-learning system's log file. In order to evaluate the performance, we used the confusion matrix technique. The obtained results demonstrate that our approach yields excellent results.

Index Terms — adaptive e-learning systems; Felder-Silverman Learning Style Model; unsupervised algorithm; supervised algorithm; K-means; Naïve Bayes

978-9854-28-3@2018-Springer

Toward Adaptive and Reusable Learning content Using XML Dynamic Labeling Schemes And Relational Databases

Zakaria Bousalem[1], Inssaf El Guabassi[2] and Ilias Cherti[1]

[1]FST, Hassan 1st Univ., Settat, Morocco

[2]Faculty of Sciences, Tetuan, Morocco

zakaria.bousalem@gmail.com , elguabassi@gmail.com , iliascherti10@gmail.com

Abstract—A learning object is "any digital resource that can be reused to support learning." A learning object should meet several characteristics: interoperability, reusability, self-contentedness, accessibility, durability and adaptability. In order to achieve the accessibility, reusability and interoperability and in the aim of allowing learners the freedom to choose the learning objects they wish to appear in their courses we propose an approach to build an adaptive and reusable learning content. The general idea of our paper is to automatically generate a course for each learner according to his individual preferences to ensure a better adaptation. For this aim we opted for the XML language to represent the course materiel. So as to avoid the weaknesses of XML databases and to benefit from the strengths of Relational databases, the XML document of the course materiel will be stored in Relational databases and in order to identify the relationships between nodes and accelerate the query processing, we use the XML labeling schemes.

Index Terms — learning object; adaptive learning; XML; Relational databases; XML labeling schemes

Finite Radon Transform and Thermal Homogenization of Periodic and Fibrous Media : The case of symmetric Eshlelby Inclusion

Anass El Mamouni, Mustapha Boukour and Abderrahim El Omri

Depart. of physics, FST of Tangier, Morocco

anass.mamouni@gmail.com , Mu.boukour@hotmail.com, Abderrahim_elomri@yahoo.fr

Abstract—The objective of this work is the bounding of the effective conductivity of a two-phase periodic heterogeneous in the two-dimensional case. This will be based on the Finite Radon Transform (FRT) formalism. The bounds are obtained when considering, and as is classically done, the case of the Eshelby inclusion where the fields are constant. Using of such formalism leads to a clearer formula where the influence of the geometry is more explicit than the corresponding ones proposed in the literature. Another advantage of the present formulation is its simplicity. A comparison can hence be done with the classical bounds of Hashin-Shtrikman (HS) obtained in the case of the Eshelby inclusion in an infinite medium. More precisely it will be shown that for some symmetrical inclusion the bounds here obtained are the same as the HS bounds.

Index Terms — Homogenization, Finite Radon Transform, Hashin-Shtrikmann bounds , periodic media, symmetric , heterogeneous conductivity, fibrous media.

A smart cascaded H-bridge multilevel inverter with An optimized modulation techniques increasing the quality and reducing harmonics

Youssef Babkrani, Ahmed Naddami and Mohamed Hilal
Depart. of Electrical Engineering, Univ. of Hassan 1st, FST, Settat, Morocco
y.babkrani@gmail.com

Abstract—The world community relied heavily on fossils energies but just after the big oil crisis the use of renewable energy has greatly increased and has become the main interest of many countries for its many advantages such as: minimal impact on the environment, renewable generators requiring less maintenance than traditional ones and it has also a great impact on economy. It is easy to get charmed by the advantages of using the renewable resources but we must also be aware of their disadvantages. One of the major disadvantages is that the renewable energy resources are intermittent and thus they have led scientists to develop new semiconductor power converters among which are the multilevel inverter. In this paper a new smart multi-level inverter is proposed so as to increase its levels according to the user's needs and also to avoid the impact of shades and the intermittence on photovoltaic panels. We also propose a modification on the multicarrier aiming to reduce the harmonics. This modification introduces a sinusoidal wave compared with trapezoidal multi-carrier to generate the pulses. In order to obtain the line voltages and the total harmonic distortions (THD) MATLAB/SIMULINK is used.

Index Terms — phase disposition (PD) , phase opposition disposition (POD) , alternative phase opposition disposition (APOD), total Harmonics Distortion (THD), Cascaded H bridge, Smart Multi-level inverter

Structural and vibrational study of Hydroxyapatite bio-ceramic pigments with chromophore ions (Co^{2+},Ni^{2+},Cu^{2+},Mn^{2+})

Mohammed Eddya, Bouazza Tbib and Khalil El-Hami

Lab. of Nanosciences and Modeling, Univ. of Hassan 1st, Faculty of Khouribga, Khouribga, Morocco

khalil.elhami@uhp.ac.ma

Abstract— Incorporating metal ions into a calcium hydroxyapatite structure is a successful pathway to increase their physical, chemical and biological properties. The calcium hydroxyapatite was obtained by solid state method at a high temperature, using $CaCO_3$ and $(NH_4)_2HPO_4$ as sources of calcium and phosphorus. Metal ion (Mn^{2+}, Co^{2+}, Ni^{2+}, Cu^{2+}) incorporation was carried out by dint of grinding and high temperature effect to remove all the impurity. the Hydroxyapatite powders that doped with metal ions were characterized by X-ray diffraction (XRD), and Fourier transforms infrared spectroscopy (FTIR) analysis to evaluate the structural and compositional changes. The only phase that is presented in pure hydroxyapatite sample was the hexagonal system. A Rietveld refinement has shown that doping with these ions affects the volume unit cell of HAP-M and it will be changed. We found that the samples doped HAP-M (M = $Mn^{2+,}$ $Co^{2+,}$ $Ni^{2+,}$ Cu^{2+}) stabilizes only in the monoclinic phase.

Index Terms — Hydroxyapatite; X-ray diffraction; FTIR; Grain size; Solid state; Rietveld refinement; Metal ion

Novel configuration of Radio Over Fiber system using a hybrid SAC-OCDMA/OFDM technique

K.S. Alaoui, Y. Zouine, J. Foshi

LEIMP: Laboratory, FST, Errachidia, Morocco

Abstract— Radio over fiber technology will play an important role in solving problems facing wireless technology. Envisaging a global village, people could transmit and receive "anytime, anywhere, and anything". In addition, the explosive growth in internet applications such as the World Wide Web, demonstrates the tremendous increase in bandwidth and low power that the coming world of multimedia interactive applications will require from future networks.ROF technology uses multicarrier modulation like orthogonal frequency division multiplexing (OFDM), which provides an opportunity of having an increased in bandwidth together with an affordable cost and this idea has recently become a suitable topic for many research works. On the other hand, SACOCDMA (Spectral Amplitude Coding Optical Code Division Multiple Access) technique is able to enhance the data rate of system and increase the number of user. In this paper we introduce a ROF link using a hybrid OFDM/SAC-OCDMA technique.

Index Terms — Radio over Fiber, SAC-OCDMA, OFDM, Access Network

Fetal Electrocardiogram Extraction and Characterization Based on LMS Adaptive Filtering and Complex Continuous Wavelet 1-D

Said Ziani, Atman Jbari, Larbi Bellarbi
Research laboratory of Electrical Engineering, Electronic Systems Sensors and Nanobiotechnology, ENSET, Mohammed V Univ. in Rabat, Morocco
ziani9@yahoo.fr, atmjbari@gmail.com, l.bellarbi@um5s.net.ma

Abstract— Extracting clean fetal electrocardiogram (ECG) signals is very important in fetal monitoring. In this paper, we proposed a method for fetal ECG extraction and characterization based on wavelet analysis and the least mean square (LMS) adaptive filtering algorithm. First, abdominal signals and thoracic signals were processed by the LMS algorithm. The abdominal signal was taken as the original input of the LMS adaptive filtering system, and the thoracic signal as the reference input. Finally, the processed wavelet coefficients were. The results indicated that the proposed algorithm can be used for extracting automatically fetal ECG from abdominal signals.

Index Terms — Fetal Electrocardiogram, Weiner Filters, Complex Continuous Wavelet

Combined Mixed Finite Element and Nonconforming Finite Volume Methods for Flow and Transport Nitrate in Porous Media

EL Moutea Omar, El Amri Hassan

Abstract— This purpose of paper is concerned with numeri- cal methods for coupled system of two PDE's equa- tion, modeling flow and transport of contaminant in porous media. For this coupled system arising in modeling of flow and transport in heterogeneous porous media, which includes two types of equation: an elliptic and a di¤usion-convection equation. We focus on miscible flow in heterogeneous porous media. We use feature the mixed finite element method for Darcy flow equation over triangles, and for concentration equation we use Nonconforming finite volume methods in unstructured mesh. Finally, we demonstrate the existence and uniqueness of solution of this coupled scheme, e¤ectiveness of the methodology a series of numerical examples.

Index Terms — Mixed Finite Element, Finite Volume Methods, Flow, Transport Nitrate, Porous Media

Three-Dimensional Micro-Computed Tomographic Study of Porous Bioceramics Using an Adaptive Method based on Mathematical Morphological Operation

Tarik Amtout, Mustapha Er-Riani and Mustapha El Jarroudi

[1]LAROSERI, Lab., Computer Science Depart., Chouaïb Doukkali Univ., El-jadida, Morocco

[2]Electrochemical and biomaterials Team, Chemistry Depart., Chouaïb Doukkali Univ., Eljadida, Morocco

[3]LIIAN, Depart. of Computer Science, Sidi Mohamed Ben Abdellah Univ., Fez, Morocco

ezzahmoulymnl@gmail.com

Abstract— Porous Calcium-hydroxyapatite (Ca10(PO4)6(OH)2) ceramics are used for bone repair. Numerous clinical studies have demonstrated the influence of size, number and pore shape of calcium-phosphate ceramics on the bone re-colonisation process. The objective of this study is to determine the microstructure, the morphological characteristics and classes of pores of the prepared hydroxyapatite (HAP) bioceramics using an adaptive method based on mathematical morphological operation. The study was carried out using X-ray micro tomography (μCT) images. The traditional method of openings alone presents limitation of calculation and not sufficient to achieve our objective. The proposed method allowed us to extract local characteristics and calculate precisely the morphological parameters while preserving the original volume of pores. The number and classes of pores with their size were calculated. The efficiency of the method is clearly demonstrated through the different reports and measurements generated. The proposed method can have interesting applications in the characterization of porous materials used in the medical field or in other sectors.

Index Terms — Biomaterials; Microstructural analysis; Image processing; Morphological operations

Symmetry group of heat transfer in a porous medium

Tarik Amtout, Mustapha Er-Riani and Mustapha El Jarroudi
Department of Mathematics, LMA, FST, Tangier, Morocco
tareqfstt@gmail.com

Abstract— In this paper, the symmetry group is performed for the heat transfer flow in a porous medium, this flow is described by coupled partial differential equations. Thanks to the method of the symmetry group, the symmetries of the coupled equations are given. The similarity variables and reduction equations generated from the symmetry transformations are provided. Such similarity reductions are computed and exact solutions are given such solutions are important in engineering applications and on the theory of nonlinear science.

Index Terms — Symmetry group; non linear partial differential equations; computer-algebra; heat transfer; energy; porous medium

A note on the fractal dimension of Mandelbrot set and Julia sets in Misiurewicz points

Ouahiba Boussoufi, Kaoutar Lamrini Uahabi and Mohamed Atounti
Lab.of Applied Mathematics and Information (MASI), Multidisciplinary Faculty of Nador, University Mohammed 1st, Morocco
ouahibabsf@gmail.com , lamrinika@yahoo.fr , atounti@hotmail.fr

Abstract— The main purpose of this paper is to calculate the fractal dimension of some Julia sets and Mandelbrot set in the Misiurewicz Points. Using MATLAB to generate the Julia sets images that match the Misiurewicz points and using a Fractal software, we were able to find different measures that characterize those fractals in textures and other features. We are actually focusing on fractal dimension and the error calculated by the software. When executing the given equation of regression or the log-log slope of an image, a Box Counting method is applied to the entire image, and the chosen features (grid design, scaling method, number of grid positions…) are available in a FracLAc Program, then we attempt to prepare the appropriate settings to get the best performance of the software. Finally, a comparison is done for each image corresponding to the area (boundary) where Misiurewicz point is located.

Index Terms — Box Counting; FracLac; Fractal Dimension; Julia sets; Mandelbrot set; Misiurewicz points

Analysis of real transient multiexponential signals using Matrix Pencil Method in Labview Environement

Lina El Alaoui El Abidi, Mounir Hanine and Brahim Aksasse
ASIA Team, M2I Lab., Depart. of Computer Science, FST Errachidia, Moulay Ismail University, Errachidia, Morocco
elalaouielabidilina@gmail.com , mounir.hanine@gmail.com , b.akssasse@fste.umi.ac.ma

Abstract— It has been a challenge for us to determine the most powerful and exact method for estimating parameters of a sum of real multi-exponentials signals. Indeed, in this study, we present and analyze two powerful methods for estimating these parameters. The first one is Matrix Pencil (MP) method, which is a linear technique for estimating the parameters. The second one is Pony method. In this work, we opted to reprogram the Matrix Pencil method and the Prony method in the Labview environment to automate signal processing and parameters estimation. The comparison between these methods shows that the Matrix Pencil method is more efficient in computation and faster. Simulation and experimental results indicate that Matrix Pencil method is less sensitive to noise than Prony method.

Index Terms — Matrix Pencil; Prony method; multiexponential signals

Porosity estimation in carbonate rock based on Voronoi diagram and 2D histogram segmentation in HSV color space

Safa Jida, Brahim Aksasse and Mohamed Ouanan
ASIA Team, M2I Lab., Depart. of Computer Science, FST Errachidia, Moulay Ismail University, Errachidia, Morocco
s.jida@edu.umi.ac.ma , b.aksasse@fste.umi.ac.ma , m.ouanan@fste.umi.ac.ma

Abstract— In this work, we propose a new segmentation method for color image in HSV color space as it was demonstrated to be a perceptual color space closely associated with the way human eyes perceived colors. Voronoi diagram (VD) are widely used in image processing but it costs an important execution task if applied directly on the image. In this paper, we propose to apply Voronoi diagram on some selected points extracted from an improved 2D histogram in HSV color space. The results are then exploited in porosity estimation in carbonate rocks using thin section image.

Index Terms — Segmentation, color image, HSV color space, 2D histogram, Voronoi diagram, Delaunay triangulation, convex hull, Knn classification, porosity, carbonate rock, Borsotti evaluation

Monitoring of the purification quality of the M'Rirt station with a view to its extension and the optimization of its performances

Imane EL Alaoui, Souad EL Hajjaji

Laboratory (LS3MN2E-CERNE2D), Mohammed V Univ., FS, Rabat, Morocco

i.alaoui1994@gmail.com , selhajjaji@hotmail.com

Abstract— Over the past decade, the National Office of Electricity and Drinking Water (ONEE) has made liquid sanitation one of his strategic missions. Thus, a rigorous follow-up of the purification performances of these various stations is necessary in order to identify their failures and dysfunctions. Among these stations, there is the station of M'Rirt that is part of the Khénifra province, in the Beni Mellal-Khénifra region. The station is spread over an area of 9 ha and is located 3.5 km from M'rirt downtown, or 400 m past the dwellings of the city on the left side of the main road connecting Meknes to Khénifra. The choice of the station location results from a study which relates to the field and which takes into account in the first place the remoteness of the houses, and secondly the topography which favors the gravity system between the basins of the station. The M'Rirt wastewater treatment plant has been operational since June 2003 and has a capacity of 31,000 population equivalents. The treatment of wastewater is done by an extensive purification process, which is natural lagooning. It is designed mainly for the treatment of wastewater from the town of M'Rirt in order to preserve the Tighza wadi in which they are dumped. The M'Rirt station was designed to treat 1800 m3 / d of wastewater and a BOD5 pollutant load of around 1200 kg / d (2010 horizon). This natural lagoon station consists of 4 anaerobic basins, 4 optional basins, and 6 drying beds. All the methods used for the analysis of the monitoring and control parameters are standardized according to Moroccan or international standards in force. The Suspended solids (SS) were determined by the gravimetric method (NM-03-7-052- 1996). Biochemical oxygen demand (BOD5) was measured by OXITOP (NM 03-7- 056-1997). The chemical oxygen demand (COD) was measured by the colorimetric method (MA 315-COD 1.0 CEAEQ Québec Standards Method, 5220D, 22nd Edition 2012). Nitrogen and total phosphorus were determined by the continuous flow colorimetric method (Skalar Methods Catmr 475-424). Based on the results of the purification performance of the M'Rirt station during the 2013-2016 period for raw and untreated sewage, it can be concluded that: The M'Rirt station operated in hydraulic overload of up to 150% and in organic overload of 92%. The wastewater at the entrance of the M'Rirt station is charged (exceeding the prescribed value 1200 kg / d) and the effluent at the exit of the station is not compliant with Moroccan standards of domestic discharge for the three Physico- chemical parameters SS, BOD5 and COD. For physico-chemical parameters, the abatement results are very low (27% of BOD5). This is due to the hydraulic and organic overload and the algal proliferation knowing that the cleaning of the anaerobic basins was carried out in 2010. According to these results, it becomes crucial to intervene to remedy this critical situation. For this purpose, ONEE proposed transforming the optional lagoons into an aerated stage.

Index Terms — M'Rirt station, natural lagooning, extension, aerated lagooning, purification performances

The pedagogical object as a smart tool for implementing an adaptive Cmooc

EL Emrani Soumaya[1], EL Merzouqi Ali[1], Khaldi Mohamed[2]

[1] LIROSA Lab., FS, Abdelmalek Essaadi University, Tetuan, Morocco

[2]LIROSA Lab., Superior Normal School, Abdelmalek Essaadi Univ., Martil, Morocco

Abstract— In practice, a pedagogical object can refer to any pedagogical component that can be used in the learning process. It could be a text, an image, a video, a web page, etc. The "Pedagogical Object" contains various definitions in literature. They are the subject of many debates and discussions. So, this paper is trying to cite some of these attempts, as well as the criteria associated with the pedagogical object. More specifically, either they are affected by their size, their context, their reuse and their effectiveness or not. Thereafter, we have described the various efforts made in this way, either at the technical, the pedagogical and the economic levels, to mention after the major advantages of the pedagogical objects use for an adaptive cMOOC (Connectivist MOOC), as well as the description of certain practical steps, in order to optimize the use of pedagogical objects in an adaptive cMOOC pedagogical design. This is done independently from the pedagogical approach, and the types of pedagogical components used. The main aim of this work is to shed some light on the pedagogical object and how it can be used in the implementation of an adaptive cMOOC as well as the benefit of using it.

Index Terms — Pedagogical object, MOOC, cMOOC, adaptive cMOOC, reuse, pedagogical content

Alzheimer Detection based on Multi-Agent Systems

Hanane Allioui, Mohamed Sadgal and Aziz El Faziki

Computer science Depart., FS Semlalia, Cadi Ayyad Univ., Marrakech, Morocco

hananeallioui@gmail.com , sadgal@uca.ma , elfazziki@uca.ma

Abstract— Recently, intelligent systems and robust image processing approaches have gained popularity in several fields of studies; Therefore, Multi-agent systems (MAS) uses in image analysis has meanwhile been established as a paradigm for analyzing images. Bearing in mind the above obstacles of medical image segmentation, the use of MAS has proved precious benefits to accomplish many tasks such as quantification of tissue volumes, medical diagnosis, anatomical structure study, treatment planning, etc. Currently, diagnosis of Alzheimer Disease (AD) is made by different clinical methods: neuropsychological, and neuroimaging assessments are the most used. Since, Magnetic Resonance Imaging (MRI) offers well-defined measurement of brain structures, it has been considered as one of the best neuroimaging examination for AD. For this reason, Agent-based modeling (ABM) is considered as a way of representing complex systems of autonomous agents, and of simulating the multiple potential outcomes of agents' behaviors and interactions. MAS adopt the decentralization of knowledge and behavior in order to provide a powerful resolution of segmentation issue. Such task is awarded to more than one agent, operating locally and communicating with others. We briefly describe a framework for Agent Based modeling (ABM) which is designed to 3D image processing especially Alzheimer MRI analysis, and highlights its important characteristics: agent behavior, perception, interactions, cooperation, and negotiation. The segmentation of images is considered as an important step in the process of computer vision. Its objective is to provide a compact and convenient formal description of objects contained in the image by the extraction of various visual indications, mainly the regions as well as the outlines of objects. Several researches were led with the aim of determining the optimal methods for the segmentation of images. This is a very crucial phase in medical imaging because it is after this step that important decisions regarding treatment and surgery planning can be performed. The performance of a detector is strictly proportional to the time of calculation and to the efficiency of the detection. The efficiency of sensors can be defined according to the following three criteria: Detection of all outlines, localization of the outlines detected in their ideal position, and sensors have to cooperate to have best results. In this work, we discuss the approach to computational model agent behavior by combining results obtained from behavioral analysis in the studied slices. We presented an improved version of the MAS image processing. We present a method for 3D object segmentation, based on the use of a combined multi-agent system, a supervised classification approach and a region growing method. The multi-agent architecture presented provides a richer approach for the image segmentation by region merging (in 3D).

Index Terms — Agent Based Modeling, Multi Agent Systems, Image analysis, 3D image processing, segmentation, Alzheimer, Neurodegenerative diseases, Cooperation

Monitoring of the temperature inside the offshore aquaculture cages of M'Diq

Mohamed Noeman Hamidoun[1], Soufian Ouali[1], Bilal Elajaj[1], Salaheddine Hamdoune[1], Abdelali Astito[1], Benyounes Abdellaoui[2] and Housni Chadli[3]

[1]Lab. CSST, FST, Abdelmalek Essaâdi Univ., Tangier, Morocco

[2] National Institute of Fisheries Research (INRH), Tangier, Morocco

[3]Aqua M'Diq S.A., M'diq, Morocco

med.hamidoun@gmail.com, shamdoun@hotmail.com, abdelali_astito@yahoo.com

Abstract— The daily behavior, the health and the growth of fish are directly related to some physical and chemical properties of its aquatic environment. As fish are poikilotherms (cold-blooded animals), the temperature of the surrounding water affects deeply their metabolic rate as well as their nutrition activity. Consequently, the temperature is the most important factor that farmers need to monitor in order to improve some farming practices like feeding the fish at the right moment with the right quantities. Therefore, obtaining this instantaneous data has a major importance either for farmers as for researchers. The objective of this work is to develop a wireless system able to take measurements of temperature in three different levels inside the fish cages and transmit them periodically to a supervision center in the port of M'Diq. Our prototype consists of two main installations: The in-situ autonomous node (IAN) and the data manipulation center (DMC). The principal role of the former is to control the measurements taken by underwater probes and transmit them wirelessly by SMS, while as the DMC receives data, save it in a database and present it through an interactive interface. The fish farming site of Aqua M'Diq (an anonymous company specialized in open sea fish farming) has 14 floating cages placed in the bay of M'Diq at approximately 2km offshore where the site benefits of a favorable maritime flow, which guarantees a high-water quality. We installed the IAN in one of these fish cages that measures 9 meters in depth and 12 meters in diameter. It consists of three temperature probes placed at three different levels; exactly at 1 meter, 5 meter and 9 meters downward from the sea level. The system is powered by 4-watt solar panel assisted by a NiMh battery that stocks the excess of the energy produced in order to exploit it at night. A control unit regulates intelligently the charge and the discharge of the battery and protect it from over-heat. Both the battery and the electronic circuit are enveloped in an insulated container.
The first tests were conducted with the main goals to evaluate the performance of the prototype. The results have shown a high quality of the wireless connectivity also an accepted solar system autonomy. In fact, despite bad climatic conditions (cloudy sky); the data was transmitted continuously with only a few short power outages. In addition, the project manager of Aqua M'Diq validated the accuracy of temperature measurements since they are equal to some measures taken manually.

Index Terms — Offshore aquaculture; wireless communication; solar system; temperature monitoring

Neural Networks Architecture for Amazigh PoS Tagging

Samir Amri and Lahbib Zenkouar

LEC Laboratory, EMI School, Med V University, Ibn Sina Street, Rabat, Morocco

amri.samir@gmail.com, zenkouar@emi.ac.ma

Abstract— In recent years there were a large number of works trying to push the accuracy of the PoS-tagging task forward using new techniques, mainly from the deep learning domain. All these studies are mainly devoted to show how to find the best combination of new neural network structures and character/word embeddings for reaching the highest classification performances, and typically, present solutions that do not make any use of specific language resources. Furthermore, Part-of-speech tagging could be viewed as a classification problem, which merits the exploration of methods that are successful in solving similar types of problems. The method of choice in this work is the use of artificial neural networks using a purely contextual representation of words (Word2Vec) as a possible solution for part-of-speech tagging. Artificial neural networks also allow the concept of deep learning, meaning they can create highly abstract representations of the data with the addition of more hidden layers. These networks should be able to excel in part-of-speech tagging without the drawbacks listed above. For example, no handcrafted features would be required; those features will be automatically discovered by the network. The network itself will not be language dependent, although the model will have to be trained on the new language, but no part of the code will have to be changed for it to be successful. One drawback of this method is that training the model would require a huge amount of text, where each word is marked with their corresponding part-of-speech tag by experts. These data sets are very expensive to produce, which poses a problem for languages that are used only by a small amount of people, such as Amazigh language. Morphosyntactic processing of natural languages is mainly restricted by the lack of labelled data sets. Deep Learning methods proved their efficiency in domains such as imaging or acoustic process. Part-of-speech tagging is an important preprocessing step in many natural language processing applications. Despite much work already carried out in this field, there is still room for improvement, especially in Amazigh language. We propose here architectures based on neural networks and word embeddings, and that has achieved promising results in English. Furthermore, instead of extracting from the sentence a rich set of hand-crafted features which are the fed to a standard classification algorithm, we drew our inspiration from recent papers about the automatic extraction of word embeddings from large unlabelled data sets. On such embeddings, we expect to benefit from linearity and compositionality properties to improve our Amazigh POS Tagging system performances.

Index Terms — CNN, DNN, Deep Learning, Neural Network, Amazigh POS Tagging

New tools for the diagnosis, characterization and improvement of the quality of coastal waters of the eastern Mediterranean, Morocco

Imad Krikech[1,2], GaËl Le Pennec[2] and Mohammed Ezziyyani[1]

[1]Department of Life Sciences, Polydisciplinary Faculty of Larache, Univ. of Abdelmalek Essaâdi, Larache, Morocco

[2]European Univ. Institute of the Sea, Univ. of Bretagne-Sud, Lorient, France.

imad.krikech@gmail.com , gael.le-pennec@univ-ubs.fr , mohammed.ezziyyani@gmail.com

Abstract— Nowadays, the implementation of new tools for monitoring and evaluation of the state of the marine environment and the fight against pollution related to human activity have become global issues. Many biological contaminants and chemical pollutants are found in sea water, therefore in aquaculture products. This context fact sea professional are looking for solutions to preserve or even improve the quality of their waters. Filter-feeding invertebrates are often selected to assess contamination by chemical pollutants and the biological impact of pollution. Among these, sponges represent a good biomarker thanks to some of their characteristics. Sponge was largely used worldwide tomonitor coastal ecosystems. In Morocco few studies have been carried out on trace metal concentration in marine sponges and limited almost exclusively to measurements of chemical parameters of water and sediments. In this area of interest, the Mediterranean sponge Petrosia ficiformis will be chosen as a model for our study. The first step of this thesis work was to establish an inventory of biodiversity and distribution of sponges on the Mediterranean coast of the Tangier-Tetouan-Al Hoceima region, in order to select the most interesting species for bioindication. Indeed, it was necessary to ensure that the chosen species is known to accumulate significant levels of pollutants, that it is accessible, naturally present and abundant on the Mediterranean coast of the Region Tangier-Tetouan-Al Hoceima to avoid introduce a non-endemic species, and finally be original from a chemical point of view in a valuation objective. For this, we conducted pilot field studies and sponge prospecting campaigns along the Mediterranean coast of the Tangier-Tetouan-Al Hoceima Region. Five sampling stations were selected between Tangier and Al-Hoceima. The choice of sampling sites was based on the presence of the reference species, the technical feasibility of collecting sponges and their proximity to sources of pollution, such as: fishing activity, urban agglomerations, areas industrial, etc. All samples taken (24 samples) were identified. Species identification has been confirmed by Jean Vacelet, CNRS, (France) and Nicole de Voogd, Researcher, NBC (Netherlands). Samples harvested (24 samples) were identified in 7 species of sponges belonging to 5 different orders, distributed in a non-homogeneous way. The species P. ficiformis has the widest distribution; it is the only one to find in all sampling sites. Due to its omnipresence on the Mediterranean coast of Morocco, its potential to bioaccumulate pollutants such as ETM and organic compounds P. ficiformis is the species we selected.

Index Terms — Petrosia ficiformis, Sponge, chemical pollutants, ETM, Region Tangier-Tetouan-Al Hoceima

A Comparative Study of RF MEMS Switch Test Methods

Hajar Baghdadi, Mohamed Lamhamdi and Karim Rhofir

[1]ISERT Lab., National School of Applied Sciences, Hassan 1st Univ, Settat, Morocco

h.baghdadi@uhp.ac.ma , mohamed.lamhamdi@gmail.com , krhofir@gmail.com

Abstract— The semiconductor industry has now reached the integration of hundreds of millions of transistors into a single chip. In the field of telecommunications, these chips integrate digital blocks, analog and mixed blocks, and RF blocks. This type of device is known as System-on-Chip (SoC). Alternatively, the techniques of SiP (System in Package) have appeared in recent years. These techniques use a common substrate on which microelectronic components are manufactured. SoCs and SiPs with embedded sensors and actuators (or Micro-ElectroMechanical Systems) become a reality. Micro-ElectroMechanical Systems, often abbreviated as MEMS are miniaturized elements, multiplied components and microelectronics that can capture and act on the environment in order to perform a number of missions. They have a small size, limited energy capacity and low memory capacity. MEMS applications exceed the scaling limits of current computational paradigms, posing serious challenges and new opportunities for information technology. Thus, these microsystems are capable of reacting in different energy domains (mechanical, thermal, magnetic, chemical, biological, etc.). However, the quality and reliability of a SoC can be degraded by the embarkation of MEMS components. This paper will present a comparison between the test techniques of RF MEMS Switches. The heart of the MEMS switches is a moving electrode that, by contacting a fixed electrode, creates modifications in an RF circuit. The movable electrode is often formed of a suspended beam exerting movements. Another form of the moving electrode is a thin disk suspended above the electrode system disposed on the substrate. The movement of the moving electrode is generated by an actuating force that is often electrostatic, but it can be thermal, piezoelectric, or magnetic. The purpose of the test is to discriminate between the good devices that respect its specifications and the faulty ones that are not functional. In general, the failures occur due to deviations in the parameters of the manufacturing process or the presence of manufacturing defects. This problem cannot be solved by a single method but requires several complementary techniques. Thus, the main objective of the work was to find a reliable way to test the RF MEMS switch and validate it with simulations. In fact, the complexity of RF SiP requires a test strategy that helps to overcome the necessity of sophisticated test equipment, as well as the access difficulties to measure embedded points. The results demonstrate that the proposed method is a fast and low-cost test technique for RF MEMS switches.

Index Terms — RF MEMS, Switch, Test, SoC, SiP, reliability

Remote Sensing/GIS for Integrated Water Resource Management in Doukkala Abda

Mustapha Elouaddany and Mohammed Karim Ben Hachmi

Lab. of Process Engineering and Environment (PEE), FST, Univ., Hassan II, Mohammedia, Morocco

elouaddany@gmail.com , benhachmikarim1@gmail.com

Abstract— Moroccan agriculture represents one of the main sectors of the national economy, one concentrates almost 40% of the job offers, that is why Morocco launched several projects which aim to save the water resources and to facilitate the access for farmers through the regional agricultural development offices which are responsible for the management of large-scale irrigation schemes and for our case at the Doukkala Abda scale. And The traditional management of irrigation projects, as well as the multitude and diversity of issues to be managed are the main obstacles to evaluation of this profession. Indeed, in order to better control the irrigated area and manage the water resources intended for irrigation, it is necessary to integrate the computer technologies and more particularly the geographical information systems since the spatial dimension presents itself an element basic in this business. Through the spatio-temporal, and as well of study of Sentinel 2 satellite image, and through study the impact of climate change on water resources in the Oued Oum Rbai Watershed which is considered one of the most important water resources in this region, and as will of conceptual data model and logical model of the data for to analyze geospatial data. The classification of geospatial data is an important step in the geo-treatment of the geographic database in order to correctly model the watersheds of the Doukkala study area Abda.This study of integrated water resources management represents a graphic presentation of spatial and attribute data, and in the form of thematic maps and spatial-temporal maps analyzes summarize in the last years the evolution and the change up to current state of hydrographic networks.This study allows decision-makers to conserve these water resources, and includes this study in projects that meet environmental and sustainable development standards.

Index Terms — GIS, Remonte Sensing, Doukkala Abda, Water Resources Management, geo-spatial database

Impact of Compost Quality on the Fertility of Agricultural Soils: Comparative Study Between 24h Compost and Classical Compost in Had Mzoura – Settat – Morocco

Abderrahim Bendaoud[1], Latifa Mouhir[1] and Abdelmjid Zouahri[2]

[1]Depart. of Process & Environmental Engineering, FST, Hassan II Univ. Casablanca, Morocco

[2]National Institute of Agronomic Research (INRA), Rabat, Morocco

abderrahimbendaoud@gmail.com , latmouh@gmail.com , zouahri@yahoo.fr

Abstract— The evolution of waste closely follows that of societies, and old waste that was essentially organic (livestock effluents, food waste, plant residues, etc.) now contains a very heterogeneous range of products (green waste, food waste, livestock effluents and industrial effluents, paper, plastic and metal packaging, etc.). Thus, new problems have emerged and the practice of composting, in particular the composting of urban waste, is at the crossroads of agronomic, environmental, social and economic issues. Intensive agriculture or phenomena such as erosion lead to a decrease in the organic matter content of soils, causing a decrease in their fertility. The use of compost in agriculture could help to combat the soil degradation. Indeed, it is generally accepted that composts contribute to the maintenance of soil organic matter, thus improving their physical, chemical and biological properties, and that they provide nutrients for crops. This work of analysis and comparison will proceed as follows: to study, on the one hand, the fertility of the concerned soil. And on the other hand, the different parameters describing the state of the two composts in the final stage of composting, and their degree of maturation and compare them in terms of nutrient content. The study of the fertility of a plot of land located on Oulad Said, in the area of Settat, showed that the soil is rich in fertilizing elements, notably N, P and K, and that it is slightly poor in terms of organic mixture and carbon content. Since then, it becomes necessary to apply an organic amendment based on mixtures of several materials. On the other hand, the study of the composting parameters of a mixture of different organic materials forming the following two composts: • **1st compost**: Organic household waste. • **2nd compost**: Agricultural waste (barley, bovine manure, straw ...). Showed that there is not a great difference between the two composts in terms of organic matter content and nutrients. Moreover, and relying on the C / N ratio and the pH value as criteria for assessing the maturity of the composts for our study, it can be said that both composts are ripe and ready for use as organic amendments.
Thus, applying the two composts following a well-defined composting plan, will give us an idea of the evolution of soil fertility parameters according to each compost, and so, their contributions in improving fertilization of soils.

Index Terms — Compost, fertility, organic matter, composting parameters, household waste, agricultural waste.

Reducing the Losses and Voltage Drop Using Reactive Power Compensation and Cable Sizing

HUSAM AWWAD
Palestinian Broadcasting Corporation Gaza, Palestine
husam20111@gmail.com

Abstract— This paper introduces suggestion to reduce the losses and voltage drop by reactive power compensation and cable sizing. This losses reduction ratio, the annual saving and reducing in voltage drop is a good motivation to rehabilitate the Gaza Governorate Electrical Grid by applying this suggestion. The grid was unbalanced in most cases, there was a big difference in losses and voltage drop between balance and unbalanced load in the two feeders have been taken as a case study.

Index Terms — voltage drop, reactive power

Using an IoT mobile robot to sensing the environment for smart home

Meftah Zouai[1], Okba Kazar[1], Belgacem Haba[2], Guadalupe Ortiz Bellot[3] and Nadia Kabachi[4]

[1]Lab. LINFI, Depart. of Computer Science, Univ. of Mohamed Khider, Biskra, Algeria

[2]Invensas Corp, San Jose, CA, USA

[3]Laboratory UCASE, Univ. of Cadiz, Cadiz, Spain

[4]Lab. ERIC, University of Lyon 1, Lyon, France

Meftah.zouai@univ-biskra.dz , kazarokba@gmail.com , bhaba@invensas.com , guadalupe.ortiz@uca.es, nadia.kabachi@univ-lyon1.fr

Abstract— Internet of things is a network of objects mainly supported by electronic devices and electronic components such as sensors and electronic cards. These objects can be physical and virtual devices, sensors or actuators. Smart environment needs a lot of sensors and in different places. The cost of these sensors is expensive. To reduce the cost of these sensors, we have proposed a mobile robot that carries a range of different sensors that will sense the surrounding environment and send information and data to the objects in the environment. Using this robot, we do not need sensors everywhere, but sensors are moving everywhere in the environment. The process of communication and communication between the robot and the objects in the environment through the MQTT protocol. Things can control the robot directly through orders received by the robot. We have implemented this Robot with a **Raspberry Pi B** perfected electronic card which has both sensors and **Arduino UNO** card for robot movement management. It is also equipped with sensors to protect the robot from colliding with barriers and obstructions. These sensors also help the robot to overcome the impediments autonomously and help to draw a partial outline of the surrounding environment where the scheme is a circle of diameter of 4 meters, and the robot control carried out via a smartphone. The commands sent via the local network to robot if the smartphone and the robot are connected in the same Gateway. If the robot in a remote site, the robot receives the commands via public network Internet. We supplied the robot with a steerable camera to view the environment. It is controlled remotely by sent commands. The IP camera server (motion) sends the captured images to the user in real time and directly. Motion is a fairly complete surveillance system. It is extremely customizable: motion detection, frame-by-frame recording, video recording, time lapse. The robot has a three main parties: displacement module; this is the module that has the role of managing the robot move, communication module: this module is for the exchange of information and commands between the robot and the user, sensing module; this module has a role of the link between the real world (the environment) and the digital world (the information world) by the transfer of real information (physical) to the digital information that can be treated and stored.

Index Terms — robot mobile, Raspberry Pi, Arduino, sensing, internet of things

Geotechnical study of the Bouregreg valley

Mohamed Jamal[1], Mohammed Boukhir[1], Ikram Ez-Zejjari[2] and Jaouad Choukrad[1]

[1]Univ. of Sidi Mohamed Ben Abdellah, FST, Lab. Géoressources and Environment, Fez, Morocco

[2]Mohammed V Univ. of Rabat, Mohammadia Engineering School, Depart. Mineral Engineering, Agdal-Rabat, Morocco

mohamed.jamal4@usmba.ac.ma , ezzejjari.ikram@gmail.com

Abstract— The mouth of Bouregreg wadi is an economic site strategic sight its geographical location. However, the geological investigations geotechnics of the surface formations are revealed necessary for installations of this site of great importance. For this reason, work that we carry out comprises the lithostratigraphic study of the various surface formations of the estuary but also their characteristics geotechnics. Thus, the low degree of the slope of the stream of the river waters has fostered the accumulation of fluvial deposits on a width which exceeds the 300m by point and a depth of several tens of meters, revealed by numerous polls which have been carried out in the valley. As well, surveys at varying depths have revealed the existence of deposits accumulated on tens of meters of thicknesses in particular in the downstream part of the estuary. The review of cores taken in site are made up of the vase, of sands muddy, sandy Levels, levels of conglomeratic fluvial origin, of estuarine alluvium and finally Marl to the basis of these formations. These fluvial deposits overcome of formations of primary age composed of including schistose rocks and volcanic. Although the nature of the lithological fluvial deposits is of a similar nature, the distribution horizontal and lateral of these is significantly different on the two shores of the river. To complement this work, a synthesis of the results of the geotechnical characteristics of the different formations will be established. It will clarify the influence of its geotechnical characteristics and the consequences for the projects or existing works of a share. For this, a modeling of the thicknesses of superficial formations as well as their geotechnical characteristics will be the conclusion of this work, the results of which will be used as a database for possible future developments of the whole valley of upstream to downstream users.

Index Terms — Bouregreg, Lithostratigraphic, deposits, consequences, Geotechnical, River, Formations.

Steganographic Algorithm based on Adapting Secret Message to the Cover Image

Youssef Taouil and El Bachir Ameur

FS, Ibn Tofail Univ., Kenitra, Morocco

taouilysf@gmail.com , ameurelbachir@yahoo.fr

Abstract—Steganography is the art of dissimulating secret data into digital files in an imperceptible way that does not arise the suspicion; it is one of the techniques of the information security field alongside cryptography and watermarking. The main challenge in the elaboration of a steganographic scheme is that no one shall suspect the existence of the information hidden inside the digital file. In this paper, a steganographic method based on the Faber-Schauder discrete wavelet transform is proposed. The embedding of the secret data is performed in the Least Significant Bits (LSB) of the integer part of the high frequency coefficients; precisely in the three blocks containing the details. The idea behind our work is to permute the binary sequence of the secret message in order to obtain another sequence which is more adequate to the LSBs of the coefficients, i.e. to obtain the sequence that keeps the error after the dissimulation as low as possible.

Index Terms — steganography, information hiding, Faber-Schauder discrete wavelet transform, permutation, least significant bit, optimal pixel adjustment procedure

The Enhancement of the Artificial Breeding Techniques of Silver Carp (Hypophthalmichthys molitrix)

Fatima-Zahra Majdoubi[1], Anouar Ouizgane[1], Mohammed Droussi[2] and Mustapha Hasnaoui[1]

[1]Environmental Engineering Team. Univ. of Sultan Moulay Slimane, FST Beni Mellal, Morocco

[2]International aquaculture consultant, Morocco

f.zmajdoubi@gmail.com , must_hasnaoui@yahoo.com , anouarouizgane@hotmail.fr , mdroussi@gmail.com

Abstract— In several countries, silver carp (Hypophthalmichthys molitrix) is considered as an effective solution to Control ecological problems (eutrophication, anarchic development of aquatic weeds in irrigation canals). Moreover, this specie is an important source to ensure food supply and to develop commercial fisheries in reservoirs. So, increasing it seeds production, which will be reared in dams, is highly required. In hatcheries, the increased knowledge of the factors affecting eggs quantity and quality, will improves fry production of fish. The ova' aging, which may occur before stripping, is one of the limiting factors that alter the seed production of several fish species. The present study was carried out in 2017 at the Deroua fish station in Morocco. It deals with the effect of ova retention in silver carp (Hypophthalmichthys molitrix) females' ovary. It investigates how to solve the loss of the ova viability caused by the in vivo aging. Otherwise, it seeks to determine how long ova, when ready to be stripped, can remain in the ovarian cavity without affecting the fertilization rates, thereby the yield of the fry production. The aging experiment was performed using eggs from 6 females. Their weight varied from 2 kg to 4.8 kg. Oocytes were sampled immediately when stripped as well as at 30, 60 and 90 minutes post-ovulation. Then, they were immediately fertilized and incubated at 24°C. For each female and post ovulation time, the fertilization rates were evaluated 12 hours after incubation. They were calculated as the ratio of fertilized ova number and total number of ova in the sample. The obtained results revealed that there is a highly significant effect of the stripping time on the fertilization performances of the silver carp. These rates were respectively, 70%, 61%, 44% and 31% at ovulation, 30, 60 and 90 minutes post-ovulation. The experiment showed that ova can be retained, in the ovarian lumen, for a very short time without affecting their viability. So, this makes the stripping planning a critical step on hatchery management. The current study will help to improve silver carp seed production at hatcheries and therefore, will ensure a sustainable renewal of this specie in Moroccan inland waters.

Index Terms — ageing, reproduction, ovulation, eggs, fertilization, stripping

Impact of chemicals used in agricultural fields on the production yield

Mohamed Yassine Doukali Fenni and Mostafa Ezziyyani
FST Tangier, Abdelmalek Essaadi Univ., Tangier, Morocco
yassinefenni@gmail.com, ezziyyani@gmail.com

Abstract— The landscape of farming practices has changed considerably with the extensive use of various types of chemicals to enhance the crop yield. In this context, this study surveys different brands of chemicals including but not limited to fertilizers, pesticides, herbicides, etc…, and evaluate their impact on the crop yield, as well as the effect on the soil, water, and turf. Firstly, by random sampling techniques, we collect data from different research sources (journals, books proceedings), the analyze the data gathered based on descriptive statistics to determine the correlation between the use of chemicals and crop yield.

Index Terms — Chemicals, Crop Yield, Descriptive Statistics

Portfolio construction using KPCA and SVM: Application to Casablanca Stock Exchange

Anass Nahil and Abdelouahid Lyhyaoui

Lab. of Innovative Technologies Tangier Abdelmalek Essaadi Univ., Morocco

anassnahil@gmail.com , lyhyaoui@gmail.com

Abstract—Portfolio construction is important for the development of effective market trading strategies. It usually affects a financial trader's decision to buy or sell an instrument. Profitable portfolios may promise attractive benefits for investors. These tasks are highly complicated and very difficult. This study investigates stock market portfolio construction that is an interesting and important research in the areas of investment and applications, as it allows more profits and returns at lower risk rate with effective portfolios. To construct accurate prediction and thus good portfolio construction, various methods have been tried, among which the machine learning methods have drawn attention and been developed. This paper introduces a machine learning method of Support Vector Machine (SVM) to construct a stocks portfolio by selecting well-performing firms in Casablanca Stock Exchange (Casablanca S.E). This model can perform a nonlinear classification. However, the accuracy of SVM classification is particularly sensitive to the quality of data. To insure a better performance of the model, we bring the Kernel Principal Component Analysis (KPCA) into SVM to extract the low-dimensional and efficient feature information. The input used in this model consists of historical values of the stocks listed in the Casablanca S.E. The entire data set covers the period from January 2012 to June 2016. To increase the predictability of the model, prices are transformed to five days relative difference in prices (RDP). The transformed data are symmetrical and closer to the normal distribution. In addition to stock prices, 28 financial and technical indicators are used in the experiment. At the first stage, the experiments for parameter setting were completed. The training performance of the SVM model for these parameter combinations was varied between 80.18% and 97.45%. On the other hand, the test performance of SVM model varied between 75.13% and 87.13%. It can be said that both the training and test performances of the SVM model are significant for parameter setting data set. However, it should be noted here that the best training performance and the best holdout performance were obtained at the same parameter combination. To analyze the obtained result, we construct an equal weighted portfolio with stocks selected by KPCA-SVM and do a comparison between the accumulated return gained by this model and MASI index of Casablanca Stock Exchange. The comparison manifests that KPCA-SVM has higher accumulated return over the MASI index, which means SVM classification used with KPCA for feature selection is accurate and highly efficient when dealing with complex and highly dimensional data.

Index Terms — Financial Market, SVM, KPCA, Portfolio, Stocks

Secured Remote Control of Greenhouse based on Wireless Sensor Network and Multi Agent Systems

K. Moummadi, R. Abidar, H. Medromi, A. Ziani

Abstract— Agent-oriented formalisms are now increasingly used in artificial intelligence. Their success is partly due to their easy adaptation to the needs of distributed real-time applications. This paper explains the design and implementation of a novel platform called Secured Remote Control of Greenhouse (SRCG) for the remote control of the inside and outside climatic and also soil parameters that influence the production in greenhouses such as temperature, humidity, CO2 and soil moisture…. A Wireless Sensor Network (WSN) provides pertinent information that is used to supervise ventilation, heating and pump…. The use of SRCG avoids the needed to perform the monitoring actions on site. The platform described in this paper is simple to be installed and used by farmers who do not have knowledge in computer skills. Thus, all farmers can control their greenhouses from a distance device in an easy and a ubiquitous manner. They can control actuators to adjust these parameters (fan, heater, drip irrigation...). The architecture of the platform is based on Multi agent systems (MAS) and a Distributed Constraint Satisfaction Problem (DCSP). MAS gather, integrate, and deliver the collected climate's parameter information from distributed sensors, and synchronize this information with a remote supervisor computer. Proposed SRCG has advantage that can handle situations in the far away area from the farms through PDA (Personal Digital Assistant) and mobile device, which shortens time, expense and supports agricultural decision-making. The prototype is built in Java employing general interfaces of both MAS and constraint programming (CP) platforms, using JADE and CHOCO libraries.

Index Terms — Greenhouse, Decision-making, Wireless Sensor network, Multi agent systems, Control, Monitoring, JADE, CHOCO

Clustering and power control to conserve energy in WSN

Zouhair A. Sadouq, Mostafa Ezziyyani, Younes Ben Chigra and Mohamed Essaaidi
sadouq@hotmail.com; ezziyyani@gmail.com; younesbenchigra@gmail.com;
essaaidi@ieee.org

Abstract— Wireless Sensor Networks consist of a large number of miniature devices called sensor nodes scattered over a geographical area called sensor field. These nodes are attempted to collect information or data which is forwarded through gateways called base stations. The communication scenario through sensor nodes leads to some amount of energy wasting. Therefore, we need to design suitable techniques and protocols in order to optimize the energy consumption and increase the network lifetime. In this paper we propose a novel energy-aware framework for a long-lived sensor network. Our framework is based on clustering architecture and achieves a good performance in terms of lifetime by minimizing energy consumption for in-network communications and balancing the energy load among all the nodes. In fact, it's an energy optimization approach based on cross-layer for wireless sensor networks, joining optimal design of the physical, medium access control, and routing layer.

Index Terms — WSN, Clustering, Self-organization, Power Control

Springer

Advanced Intelligent Systems for Sustainable Development