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BOOK ABSTRACT

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Preface

This book of proceedings collects papers and posters accepted for presentation at the 6th International Conference on Business Intelligence (CBI 2021). CBI 2021 was organized by the Faculty of Sciences and Techniques (FST), and the laboratory of Information Processing and Decision Support (TIAD) at Sultan Moulay Slimane University along with Association of Business Intelligence (AMID), and held during May 27–29, 2021, in Beni Mellal, Morocco

CBI 2021 received 60 paper submissions from authors at various universities, of which 43% were included in this book. The papers were selected by the event chairs and their selection was based on a number of criteria including treated topic, originality of the contribution, and comments provided by scientific committee members; each paper was reviewed by at least three reviewers. The authors of selected papers were then invited to submit revised versions.

The goal of the CBI conference is to provide an international forum for scientists, engineers, and managers in academia, industry, and government to address recent research results and to present, discuss, and share their ideas, theories, technologies, systems, tools, applications, and experiences on all theoretical and practical issues. CBI 2021 covered all topics related to business intelligence, optimization and decision support and database and web environment.

We would like to thank the president of Sultan Moulay Slimane University, and the dean of the Faculty of Sciences and Techniques for their support to the conference, and everyone who contributed to the success of this conference.

Special thanks to the members of the different committees for their support and collaboration. Also, we would like to thank the local Organizing Committee, reviewers, speakers, authors, and all conference attendees. Finally, we want to thank Springer for their support of this publication.

Organizing committe Chairs

Mohamed FAKIR Mohamed BASLAM Rachid EL AYACHI

Papers Abstracts

Section_01: Decision Support, Information Systems and NLP

Part-of-Speech Tagging Using Long Short Term Memory (LSTM): Amazigh Text Written in Tifinaghe Characters

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Abstract—Long short term memory (LSTM) networks have been gaining popularity in modeling sequential data such as phoneme recognition, speech translation, language modeling, speech synthesis, chatbot-like dialog systems, and others. This paper investigates the attention-based encoder-decoder LSTM networks in TIFINAGH part-of-speech (POS) tagging when it is compared to Conditional Random Fields (CRF) and Decision Tree. The attractiveness of LSTM networks is its strength in modeling long-distance dependencies. The experiment results show that Long short-term memory (LSTM) networks perform better than CRF and Decision Tree that have a near performance.
Keywords—: Tifinagh · Part-of-speech · Conditional Random Fields (CRF) · Decision tree · Recurrence neural network (RNN); Long short term memory (LSTM) networks · Sequence-to-sequence learning

Contribution to Arabic Text Classification Using Machine Learning Techniques

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Abstract— With the increase of text stored in electronic format, it is no longer possible for humans to understand all the incoming data or even categorize it. We need an automatic text classification system in order to classify them into

predefined classes and quickly retrieve information. Text classification can be achieved by machine learning, it requires a set of approaches for vectorization and classification. In vectorization phase, this work proposes two approaches (BOW and TF-IDF), but in the classification phase, the algorithms of machine learning used are: RL, SVM and ANN. At the end, a comparison study is given.

Keywords— Machine learning · Natural language processing · Text representation · Text vectorization · Arabic text classification.

Analyzing Moroccan Tweets to Extract Sentiments Related to the Coronavirus Pandemic: A New Classification Approach

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Abstract— At the end of 2019, the world has known the covid-19 crisis that negatively affected the health, economic, social, and psychological status of people. Since the beginning of this crisis, users express their ideas, opinions, and sentiments about the coronavirus on all social networks such as Facebook, Twitter, Instagram, etc. For example, until May 8th, 2020, the number of tweets published on Twitter is equal to 628,809,016. In this paper, our proposed method analyzes and classifies covid-19 tweets published in morocco for extracting sentiments. Our approach uses the advantages of new proposed tweets features using a dictionary-based approach and a Python library for developing a new recommendation approach. As Experiments, Our proposed approach outperforms the well-known machine learning classifiers. We find also that based on the epidemiological situation in morocco, the sentiments of Moroccan users changed.

Keywords— Sentiment analysis · Covid-19 · Recommendation system · Collaborative filtering · Classification

Towards a Support System for Brainstorming Based Content-Based Information Extraction and Machine Learning

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Abstract— Brainstorming is an effective technique for seeking out ideas on a specific issue that can be expressed shortly and powerfully and then determine

the best solution. As a method, It is especially popular in areas that rely on creativity such as industry and advertising. Many solutions are created in the service of digital brainstorming to enable better management, however, literature still reports that these techniques offer only partial solutions in themselves. In this work, we present an architecture of a support system for brainstorming activities based on content-based information extraction and Natural Language Processing. First results show that it is possible to make decisions automatically or to effectively help the user to make the right decisions.

Keywords— Brainstorming · Support system · Knowledge · Natural Language Processing · Content-based information extraction.

Classification of Documents Using Machine Learning and Genetic Algorithms

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Abstract— In the past few years, there has been rampant growth in the amount of complex documents that stand in need of a deeper understanding of machine learning methods to classify them in many applications. The success of these methods depends on their ability to understand complex patterns and nonlinear relationships in data. Yet, finding the right structures, architectures, and techniques for text classification is often a challenge for researchers. In this article, we present an automated document classification system based on two axes; the first regard the processing of natural language (NLP), along with the second that focuses on Machine Learning (ML) algorithms. In addition, a hybrid system that combines the best of classification models in a single strong system with a very high percentage of accuracy that we came to give rise to with the genetic algorithms (GA).

Keywords— Document classification · NLP · ML · Hybrid system · GA

Toward Student Classification in Educational Video Courses Using Knowledge Tracing

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Abstract— Using videos as a learning resource has received a lot of attention as an effective learning tool. Knowledge Tracing is intended to track students' knowledge acquisition when they answer a serie of problems. In this paper, we describe an experiment to model students' knowledge acquisition in educational video courses. For this purpose, Deep Knowledge tracing is used to classify and predict learners' performance as they interact with an educational video course in the subject of "C programming language". Learners' responses in previous quizzes were analyzed in order to forecast their next responses. The implementation of DKT in our dataset, led to an AUC (Area Under the Receiver Operating Characteristic Curve) of 0.73 which is a notable performance.

Keywords— Deep knowledge tracing · Video course · Performance prediction · Video quizzes

Assessment of Lifestyle and Mental Health: Case Study of the FST Beni Mellal

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Abstract— Lifestyle habits are defined as behaviors of a sustainable nature which are based on a set of elements incorporating cultural heritage, social relations, geographic and socio-economic circumstances as well as personality. Mental health encompasses the promotion of well-being, the prevention of mental disorders, and the treatment and rehabilitation of people with these disorders. In order to address this issue, we propose a solution which consists of the development of an extended autonomous computer model for large textual data. This model will make it possible to give a psychological, emotional or even a lifestyle character from tweets or a web forum. So we turned to the notions of sentiment analysis and Text Mining using Deep Learning. This work (which will be limited to a Moroccan context) concerns the development of a computer model that allows to determine the habits of life and the Health of the students of the Faculty of Sciences and Technologies at the Sultan Moulay

Slimane university in Beni Mellal. We started by developing a script to retrieve posts made by students from a Facebook group. The choice of Facebook and not Twitter is due to the fact that the twitter community among the students is relatively small. Afterwards, we built our deep learning model and we tested it with data from twitter comprising of thirteen (13) classes (anger, joy, sadness, disgust etc.). We also submitted these textual data to automatic learning algorithms (naive Bayesian, K nearest neighbors).
Keywords— Web scraping · Sentiment analysis · Text classification · Machine learning · Deep learning.

The Search for Digital Information by Evaluating Four Models

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Abstract—As information becomes more and more abundant and accessible on the web, researchers do not have to dig through books and libraries. Web pages are rich in textual information, the web search engines provide Internet users with various files corresponding to the searched keywords. This large number of digital data makes manual sorting difficult to do, so it is necessary to automate collection of useful information using techniques based on artificial intelligence. In today's digital age, great importance is given to information retrieval techniques via Internet. Therefore, it appears essential to preconize a credible and performing system dealing with all textual information, in order to deduce structured and useful knowledge. This work focuses on four models used in the field of information retrieval, and highlights their limits of use, with a view to developing new techniques that can fill the gaps detected. At the end, the evaluation parameters will be discussed to enhance human intervention in decision making.
Keywords—Extraction of knowledge · Boolean model · Text mining

Overview of the Main Recommendation Approaches for the Scientific Articles

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Abstract— With the explosive growth of the data that being produced and published on the Web every day by the scientific community, it is becoming difficult for researchers to find the most appropriate scientific articles for their needs. For alleviate such information overload, the recommender systems plays a key role in allowing users to access what interests them as quickly as possible. This is why we are going to focus on finding the best approach that can be supported in scientific articles recommendation systems, to be able to guide the researchers in finding articles in an effective way. This paper presents a comparison between the main Recommender Systems techniques that aims to recommend to users the relevant articles, according to preferences and habits. Preference and relevance are subjective and are generally derived from items previously consumed by users. We chose here three most used techniques; first, collaborative filtering, then content-based systems and finally a Hybrid recommendation. To evaluate the recommendation we have used classical measures in search of information: precision at top k, recall at top k, NDCG@k and novelty of the recommended items.

Keywords— Recommender systems · Scientific articles · Collaborative filtering · Content-based · Hybrid methods.

Online Students' Classification Based on the Formal Concepts Analysis and Multiple Choice Questions

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Abstract— Students orientation in the university is an important research area. Actually, students fill out their choice manually except some specialties in which there is a preselection. These procedures are very classics, they based on the student's marks to calculate a general average that puts the student above or below a selection bar. Several problems arise from these procedures,

the major problem is that a majority of students are misguided. As the solution of this problem, we purpose, in this paper, a new approach for automatic student's orientation witch incorporate the Formal Concept Analysis (FCA) techniques. On one hand, we have students as objects and the online proposed questions are the attributes, on the other hand we have the specialties as objects and the questions as attributes. These objects and attributes help us to build a Concept Lattice Student (CLS) and Concept Lattice Specialty (CLSp). Then after we introduce two algorithms that explore the two concepts lattices and extract the pair (student, specialty) which is our classification result.
Keywords: Students' classification · FCA · Concept lattice.

How BERT's Dropout Fine-Tuning Affects Text Classification?

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Abstract— Language models pretraining facilitated fitting models on new and small datasets by keeping the previous pretraining knowledge. The task-agnostic models are to be fine-tuned on all NLP tasks. In this paper, we study the fine-tuning effect of BERT on small amount of data for news classification and sentiment analysis. Our experiments highlight the impact of tweaking the dropout hyper-parameters on the classification performance. We conclude that combining the hidden layers and the attention dropouts probabilities reduce overfitting.
Keywords—BERT · Fine-tuning · Text classification · Dropout.

Section_02: Big Data, Datamining, Web Services & Web Semantics

Selection of Composite Web Services Based on QoS

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Abstract— Today, web services and Service-Oriented Architecture (SOA) are causing a lot of ink and research to be reinforced. This architecture makes the composition of web services a necessity. Considering the increase of these in a way that has many proposals for a single customer request. The proposal of other forms of composition based on quality of service (QoS) that will save time and will perfectly meet the user's request given the criteria required by each customer presents a challenge today. In this article, we propose a new concept of composition of web services based on QoS, this concept is based on dominance in the sense of Pareto.

Keywords— Web services · Quality of service · Pareto dominance · Binary composition · Selection algorithms · Function of fuzzy dominated

A MapReduce Improved ID3 Decision Tree for Classifying Twitter Data

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Abstract— In this contribution, we introduce an innovative classification approach for opinion mining. We have used the feature extractor Fast Text to detect and capture the given tweets' relevant data efficiently. Then, we have applied the feature selector Information Gain to reduce the dimensionality of the high feature. Finally, we have employed the obtained features to carry out the classification task using our improved ID3 decision tree classifier, which aims to calculate the weighted information gain instead of information gain used in traditional ID3. In other words, to measure the weighted information gain for the current conditioned feature, we follow two steps: First, we compute the weighted correlation function of the current conditioned feature. Second, we multiply the obtained weighted correlation function by the information gain of this current conditioned feature. This work is implemented in a distributed environment using the Hadoop framework, with its programming framework MapReduce and its distributed file system HDFS. Its primary goal is to enhance the performance of a well-known ID3 classifier in

terms of accuracy, execution time, and ability to handle massive datasets. We have performed several experiments that aim to evaluate our suggested classifier's effectiveness compared to some other contributions chosen from the literature.

Keywords— ID3 decision tree · Opinion mining · Hadoop · HDFS · MapReduce · Fast text · Information gain

Clustering Techniques for Big Data Mining

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Abstract— This paper introduces the Clustering method as an unsupervised machine learning where the input and the output data are unlabeled. Many algorithms are designed to solve clustering problems and many approaches were developed to enhance deficiency or to seek efficiency and effectiveness. These approaches are partitioning-based, hierarchical-based, density-based, grid-based, and model-based. With the evolution of data amounts in every second, we become faced to deal with what is called big data that compelled researchers to develop the algorithms based on these approaches in order to adjust them to manage warehouses in a fast way. Our main purpose is the comparative of representative algorithms of each approach that respect most of the big data criterions which are called the 4Vs. The comparison aims to figure out which algorithms could mine efficiently information by clustering big data. The studied algorithms are FCM, CURE, OPTICS, BANG, and EM respectively from each approach aforementioned. Assessing these algorithms based on the 4Vs big data criterions which are Volume, Variety, Velocity and Value shows some deficiency in some of them. All trained algorithms clusters well large datasets but exclusively FCM and OPTICS algorithms suffer from the curse of dimensionality. FCM and EM algorithms are very sensitive to outliers which affect badly the results. FCM, CURE, and EM algorithms require the number of clusters as input which plays a deficiency if the optimal one wasn't chosen. FCM and EM algorithms give spherical shapes of clusters unlike CURE, OPTICS, and BANG algorithms which give arbitrary ones that play an advantage for cluster quality. FCM algorithm is the fastest in performing big data, unlike EM algorithm that takes the longest time in training. For diversity in types of data CURE algorithm trains both numerical and categorical data types.

Consequently, the analysis leads us to conclude that both CURE and BANG are efficient in clustering big data but we noticed that CURE lacks a bit of accuracy in data assignment. Therefore we infer to qualify the BANG algorithm to be the appropriate one to cluster a large dataset with high dimensionality and noise within it. BANG algorithm is based on a grid structure but comprises implicitly partitioning, hierarchical and density approaches the reason behind its efficiency in giving good accurate results. But even so, the ultimate accuracy in clustering isn't reached yet but almost close. The conclusion we observe from the BANG algorithm should be applied to more algorithms by mixing approaches in order to attain the ultimate accuracy and effectiveness that lead consequently to accurate future decisions.

Keywords— Datamining · Clustering · Clustering approaches · Big data · 4Vs · Machine learning · FCM · CURE · OPTICS · BANG · EM

Data Mining Approach for Intrusion Detection

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Abstract— Intrusion detection systems are simply a security layer that aims to detect malware and unusual events in a network where they have been installed and notify the system administrator with an alarm. Intrusion detection systems divided into several types depending on the configuration that they have, these configurations are linked to the following components, which are defined as (1) the information source of the IDS, (2) the detection approach, and (3) the architecture of the IDS itself. The component that interests us is the detection approach, in general, two major detection approaches can be used within an IDS, a signature-based approach and a behavioural or anomaly-based approach, these two detection approaches can be treated with different techniques, one of these techniques is the technique of Data Mining. An intrusion is an activity that differs from the usual events, while an anomaly is an observation that differs so much from other observations. The intrusion and anomaly arouse suspicion that a different mechanism generated them. The objective is to understand these mechanisms behind intrusions and anomalies. Based on this idea, we say that the analogy of intrusion detection systems in Data Mining detects anomalies. The objective of intrusion detection systems is to detect attacks in a network, while the

objective of the Data mining anomaly detection approach is to detect anomalies in a dataset. The anomaly detection approach is divided into three main techniques, supervised detection, unsupervised detection, and semi-supervised detection. The selection of the anomaly detection technique is based on the availability of class labels in the dataset. In our research study, we are using two real datasets, which are the KDDCup99 dataset and the NSL-KDD dataset. These two datasets contain thousands of normal network events and real attacks. Our goal behind this research study is to evaluate supervised and unsupervised detection techniques and compare each technique's performance based on the results obtained.

Keywords— Data mining · Clustering · Intrusion detection · SVM · K-means · KNN · C4.5 · ANN

Section_03: Optimization and Decision Support

Markov Decision Processes with Discounted Rewards: New Action Elimination Procedure

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Abstract— Since the computational complexity is one among stations of interest of many interested researchers, numerous procedures are appeared for accelerating iterative methods and for reducing the memory bits required for computing machines. For solving Markov Decision Processes (MDPs), several tests are proposed in the literature and especially to improve the standard Value Iteration Algorithm (VIA). The Bellman optimality equation have played a central role for establish this dynamic programming tool. In this work, we propose a new test based on the extension of some test for eliminating non-optimal decisions from the planning. In order to demonstrate the scientific interest of our contribution, we compare our result with those of Macqueen and Porteus by an illustrating example. Thus, we reduce the state and action spaces size in each stage as soon as it is possible.

Keywords— Markov processes · Computational complexity · Non-optimal decision · Stochastic optimization

Learning Management System Comparison: New Approach Using Multi-Criteria Decision Making

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Abstract— Learning management system with its various means, enable us to track the level of learners based on the exploitation of the information that it provided to us, Especially with the closure of educational institutions due to the Corona virus. But these methods differ in their effectiveness and results according to the purpose for which they are used. This article presents a new method for comparing the means of a learning management system, as we relied on pointing features, but these features do not have the same distribution and the same effect as their importance varies according to the purpose of the study, in our case we consider all the weights equal 1, so we apply the Multi-Criteria Decision Making algorithm to solve this problem by using sum normalization for maximization of Adaptive learning, Technology collaboration, Security, mobile, Ratings, Learning Analysis reports, Easy use and inverse for the minimization of price. To experiment this method, we compared Moodle, Sakai, Claroline, TalentLM, Easy LMS and OpenedX for the purpose of tracking learners' performance. The result shows that Moodle is the best for tracking learners'.

Keywords— Learning management system · Moodle · Sakai · Claroline · TalentLM · Easy LMS and OpenedX

Finding Agreements: Study and Evaluation of Heuristic Approaches to Multilateral Negotiation

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Abstract— Negotiation is a process by which participants get an agreement that satisfies them all. Multilateral negotiation involves more than two agents.

The complexity of negotiation intensifies when involving multiple agents with conflicting interests that need to reach a joint agreement. To model negotiation, we have three axes: object of negotiation, negotiation protocol, and negotiation model. There are Several negotiating approaches are available to study negotiation model. The heuristic is the most commonly used in multilateral negotiations, because it realistically simulates negotiating problems. Negotiation is made more difficult when there are multiple agents who need to reach an agreement on differing interests. An important facet of any successful negotiation is to lay out a clear and specific protocol guiding the interactions between the agents. In our research study, the negotiation protocol is based on the divide and conquer concept. In other words, agents are divided into several groups where they debate without a mediator. This article aims to evaluate and study two heuristic approaches. In the first approach, the agents negotiate on a single attribute; we will compare this approach to the case where the agents negotiate in a single group according to the results obtained. In the second approach, the agents negotiate on several attributes. This approach is compared with the first approach to determinate in which case of the second approach it is better to use the first approach to facilitate the search for agreement.

Keywords—Agreements, Negotiation, Multilateral approach, Heuristic approach

Section_04: Signal, Image and Vision Computing

A New Approach Based on Steganography to Face Facial Recognition Vulnerabilities Against Fake Identities

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Abstract—By the huge use of biometric identification and authentication systems, securing user's images is one of the major recent researches topics. In this paper we aim to present a new approach which is based on detecting face in any picture (even with low quality) a detection that can goes to 93%. As a second work we aim to test the ability of this algorithm to identify people

while wearing medical masks. In fact, with the spread of Covid-19, people are now obliged to wear medical masks. These masks cover almost 60% of persons faces, this lack of information can prevent the identification of the person or can create some confusions. And To secure images and prevent identity theft we propose an approach that consists of hiding a generated key in each person's image. This unique key is based on user's personal information, the key will be verified by Luhn algorithm, which is considered as a widely used algorithm to verify generated IDs. As a third work, we aim to hide the person's ID in the image using a steganographic algorithm. Our work main objective is to protect pictures and prevent any attempt of creating a fake model of the owners. Therefore, the ID hidden in the picture will be destructed in every attempt of creating a fake image or model.

Keywords—Face recognition, Steganography, Luhn algorithm, Secure pictures, Covid-19

Mean Square Convergence of Reproducing Kernel for Channel Identification: Application to Bran D Channel Impulse Response

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Abstract—Nowadays, in the field of nonlinear system identification, the function approximation builds on the theory of reproducing kernel Hilbert spaces (RKHS) is of high importance in kernel-based regression methods. In this paper, we are focused on the finite impulse response identification problem for single-input single-output (SISO) nonlinear systems, whose outputs are detected by binary value sensors. In the one hand, we have used kernel adaptive filtering methods, such as, kernel least mean square (KLMS) and kernel normalized least mean square (KNLMS) to identify the practical frequency selective fading channel called Broadband Radio Access Network (BRAN). In the other hand, the mean square convergence is also investigated to indicate the robustness of the kernel normalized LMS algorithm. Monte Carlo simulation results in noisy environment and for various data length, shows that the kernel-normalized LMS algorithm can provide superior accuracy as opposed to the kernel-based LMS algorithm.

Keywords—Identification, Single-input single-output, Kernel normalized least mean square, Kernel least mean square, Binary sensors

Deep Learning for Medical Image Segmentation

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Abstract—Alzheimer's disease is recognized as a progressive loss of memory and often leads to a total loss of autonomy, which renders it difficult to tolerate. Hippocampus is among the first cerebral regions to be infected in AD. An accurate diagnosis at an early stage of AD is crucial for the intervention process. The low contrast of supporting tissues and organs makes segmentation of the CC from brain MRI very difficult. In this paper we introduced both automatic brain image segmentation methods to extract the Corpus Callosum (CC), the first based on SLIC using parallel implementation which gives accelerated results over classical SLIC, the second method motivated by using Deep Learning approach. Finally, we compare the outcome given by the previous approaches.

Keywords—Magnetic resonance imaging, Segmentation, Corpus callosum, Alzheimer's disease, Simple linear iterative clustering, Deep learning

Section_05: Networking and Cloud Computing

Optimal Virtual Machine Provisioning in Cloud Computing Using Game Theory

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Abstract— Virtualization of resources on the cloud computing allow fast and easy scaling of infrastructure to achieve a specified QoS. This will undoubtedly improve the allocation efficiency of physical machines in large-scale data centers. In fact, virtualization technologies not only have a direct effect on the performance and energy consumption but also can reduce the operating costs considerably. As there is fierce competition among cloud providers, there is an urgent need to adopt an elastic resource management system and an optimal pricing strategy as well. Such a strategy is designed principally to satisfy the

requirements of a given service and simultaneously increase its associated profit margins. This study highlights why game theory is a very useful tool to analyze the impact of both energy efficiency and response time on virtual machine (VM) provisioning. To this aim, we present a formal policy that ensures fairness in the resource sharing and also takes into account the reasonable expectations market participants. More precisely, we rely on a non-cooperative game model in choosing the right provisioning scheme, and then discuss its equilibrium and stability. In a duopoly market, we conduct some numerical experiments to illustrate the efficiency and performance of the proposed approach and its proof of convergence with a certain number of iterations.

Keywords—Game theory, Noncooperative game, Cloud computing, System performance, Energy saving, Healthy competition.

Comparative Study Between RFID Readers Anti-collision Protocols in Dense Environments

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Abstract— Radio Frequency IDentification (RFID) is a wireless communication technology, that suffers from a recurring issue and one of the most important challenges of RFID networks: Collision between readers that occurs when a several readers are placed very closely to each other, thus decreasing efficiency of RFID systems. In literature, many anti-collision protocols have been proposed to reduce reader collisions. In this paper we present a review of the best performing anti-collision protocols for RFID collision avoidance which are Geometry Distribution Reader Anti-collision (GDRA), Distance based RFID reader Collision Avoidance protocol (DRCA), Beacon Analysis based Collision Prevention (BACP), Distributed Efficient & Fair Anti-collision for RFID (DEFAR). This study is on the performance of these protocols in a dense RFID environment, advantages and disadvantages of each protocols in a static deployment where readers are immobile using MATLAB.

Keywords—Anticollision protocols, BACP, DRCA, DEFAR, Dense, RFID environment, GDRA, Interference.

Game Theoretic Approaches to Mitigate Cloud Security Risks: An Initial Insight

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Abstract—Cloud computing is one of the most promising innovations impacting data storage and processing. And with it, clients rely on the IT solutions offered by an external provider instead of on-premise applications. Despite its enormous impacts, customers are still reluctant to outsource their business processes because of security concerns. As data is typically stored and governed by cloud vendors, users need to deal with security issues linked to the loss of control over their sensitive data. Cloud providers need to implement the appropriate security measures that might attract more clients while making the minimum investment. While used in various disciplines, game theory has recently expanded to investigate the effect of the defenders' and attackers' behaviors on strategic decision-making. This study aims to develop insights into how game theory can develop better security policies in cloud computing. First, we perform threat modeling to identify the potential threats facing cloud. Second, we identify the limitations of existing game based solutions and then suggest an improved model define an adequate strategy that would figure out the right balance between the required security level and the profit margins. Besides, we present future directions that can be explored to build highly reliable and optimal strategies for cloud services.

Keywords—Cloud computing, Security issues, Threats, Game theory

Comparative Study on the McEliece Public-Key Cryptosystem Based on Goppa and QC-MDPC Codes

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Abstract— In recent years, much research has been conducted on quantum computers – machine that exploit the phenomena of quantum mechanics to solve difficult or insoluble mathematical problems for conventional

computers. If large-scale quantum computers are built, they will be able to break many of the public key cryptosystems currently in use. This would seriously compromise the confidentiality and integrity of digital communications on the internet. Post-quantum cryptography aims to develop secure cryptographic systems against both conventional as well as quantum computers for interacting with existing protocols and communication networks. In this paper we present a public key cryptosystem of McEliece based on the correcting codes, using two types of correcting codes; QC-MDPC and Goppa correcting codes. This latter seems very interesting considering its two characteristics, namely the power of correction and the efficient decoding algorithm which resistant to quantum attacks due to difficulty of decoding a linear code. On the other hand, QC-MDPC cryptosystem code is rapid and more secure than Goppa cryptosystem.

Keywords—McEliece cryptosystem, QC-MDPC codes, Goppa code, Post-quantum cryptography, Bit flipping algorithm

Optimization of Leach Protocol for Saving Energie in Wireless Sensor Networks

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Abstract— In low powered Wireless Sensors Networks (WSNs), the optimization of energy consumption is major challenge facing researchers in this field.

A new clustering protocol for WSNs based on the existing LEACH protocol, is developed in this paper. The main idea in this work is to reduce energy consumption for sending the sensed data from sensors to the base station. In the existing LEACH protocol, in every cluster, sensed data are collected from all sensors, aggregated and directly sent to the base station by the cluster head. But our protocol differentiates the cluster heads which are far and near to the base station. Depending upon the distance the far node from the base station will send its aggregated data to an intermediate. Above cycle will be repeated until the entire data is delivered to the base station by its nearest intermediate node.

This technique, by bypassing long distance transmissions which are energetically greedy, has shown its great ability to preserve, for a long time,

the energy and the number of nodes in WSNs with large areas, and low density of nodes. These results are confirmed by some different tests performed on a set of networks of different parameters.

Keywords—WSN, Hierarchical routing, LEACH, PEGASIS, Optimization of energy, MOD-LEACH.

Posters Abstracts

Section_06: Big Data, Datamining, Web Services & Web Semantics

Brain Cancer Ontology Construction

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Abstract— An ontology is an integral part of a semantic web. Ontology can be designed and create the necessary metadata elements to develop a semantic web applications. The evolution of semantic web has encouraged creation of ontologies in many domains. This work aims to create an ontology of brain cancer to do this we need to define the steps of creation of an ontology; first, we need a lot of information about brain cancer. This article describes the different steps involved in creating a brain cancer ontology. We have used a Protege 4. 2 to for the construction of a brain cancer ontology.

Keywords— Semantic web, Ontology, Protégé, Brain cancer, Owl

Semantic Web for Sharing Medical Resources

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Abstract— The classical web is very helpful for using in different domain, especially in medicine. But still trying to improve results for this, we propose to use semantic web for sharing medical resources. In this article, we will discover the principle of the semantic web, which consists understanding the true meaning of the concepts in order to simplify the presentation of the data,

which then serves to give the precise result during the research and the advantage of using the semantic web for sharing of medical resources. We use logical «Protege» to present the concepts and relation between them. And the limits that require innovation.
Keywords— Semantic web, Ontology, Protégé, Medical resources, Owl

Construction of Glaucoma Disease Ontology

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Abstract— Nowadays, accessing and sharing available information about the medical field in a smart way is a major problem. Ontologies in the medical field provide a machine-understandable vocabulary as well as it associates basic concepts of this field and the relations between these concepts, which makes it possible to make the knowledge reusable. In this article we will build an ontology of glaucoma disease.
Keywords— Ontology, Glaucoma, Concept.

Section_07: Signal, Image and Vision Computing

Creation of a Callbot Module for Automatic Processing of a Customer Service Calls

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Abstract— Bots are now more and more present in our daily life, we can find them in the form of chatbots, voicebots or FAQs. Since the number one source of customer demand is phone calls, callbot becomes a requirement in order to ensure a 24/7 presence and to minimize customer wait times in addition to demining charges. Callbots present a new kind of machine-human interface.
In this article, we are making a prototype call bot to manage incoming calls to a French-speaking call center specializing in customer relations. The first callbot is deployed for a period of 4 months, the first results are satisfactory and motivate for move on to new stages of setting up the callbot system.

Keywords—NLP, Human machine systeme, Callbot, French-speaking

Applied CNN for Automatic Diabetic Retinopathy Assessment Using Fundus Images

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Abstract— In the area of ophthalmology, diabetic retinopathy affects an increasing number of people. Early detection avoids severe diabetic proliferative retinopathy complications. In this paper, we propose a method for binary classification of retinal images using convolutional neural networks architecture. This method is formed to recognize and classify a retinal image as normal or abnormal retina. The paper setup is, first of all a preprocessing step is applied, next by data augmentation, and then a CNN formed, and applied. To train, validate and test the proposed model, we have used a public dataset "Resized version of the Diabetic Retinopathy Kaggle competition dataset" from Kaggle web site. Proposed model has trained using 4000 images of the normal retina and 4000 images of abnormal diabetic retina, and 500 images of the normal retina and 500 images of abnormal diabetic retina for testing. The accuracy Achieves 89% in 100 images of single prediction words.
Keywords—Convolutional neural networks, Binary classification of images, Deep learning, Diabetic retinopathy.

RFID Based Security and Automatic Parking Access Control System

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Abstract— Nowadays, the most of existing parking management systems still rely on human interventions to perform thousands of parking transactions that

can be more difficult in a huge parking, which receives many visitors. Problems that arise due this kind of parking management systems are access by unauthorized users, less public security and fraud to pay parking fees. In this paper, we address these problems by applying an automated technology at the terminal parking, which is Radio Frequency IDentification (RFID). With RFID technology, users cannot access to parking lots without RFID tag as identification and the check-in/ check-out can be done very fast by avoiding the congestion problem and decreasing the waiting time at every parking terminal. This system ensure a higher security as only the registered users are allowed to access into parking lot. In this paper, an automated parking access control system is designed and its implementation was made by simulating a miniature of the gate portal system using RFID technology. This system allows identification of vehicles, records at what time they enter or leave the parking lot and calculates the parking fee based on time duration between its arrival and its departure. The user is notified for the parking fee and payment receipt through an email.

Keywords— Parking fee Radio Frequency IDentification Smart parking system Security Unique IDentifier.