

ICTCS'2017

Accepted Papers' Abstracts

Overall, ICTCS'17 received a total of 117 scientific papers. After a thorough peer review, we accepted 55 papers. We list below all accepted papers and their abstract.

Comparison of Crossover Types to Build Improved Queries Using Adaptive Genetic Algorithm

Khaled Almakadmeh and Wafa' Alma'aitah

Abstract— this paper presents an information retrieval system of using genetic algorithm to increase information retrieval efficiency. Using vector space model, information retrieval based on the similarity measurement between query and documents. Documents with high similarity to query are judge more relevant to the query and retrieved first. Using genetic algorithms, each query represented by a chromosome, these chromosomes fed into genetic operator process: selection, crossover, and mutation until an optimized query chromosome obtained for document retrieval. The proposed approach is experimented using a data set of (242) proceedings abstracts collected from the Saudi Arabian national conference. Experimental results show that information retrieval with adaptive crossover probability and two-point type crossover and roulette wheel as selection type give the highest recall.

Keywords— Adaptive genetic algorithm; vector space model; Cosine similarity, Crossover.

Arabic Cultural Style Based Music Classification

Islam Elkabani, Lama Suboh and Ziad Osman

Abstract— Automatic music genre classification are essential for applications that provide music analysis and music retrieval as well as for recommendation systems. Most of the prior research in this domain focused on investigating western music genre classification. The automatic classification of Arabic cultural style music has never been studied. In this paper, we present an approach for classifying digital Arabic songs automatically based on their cultural style. Four Arabic cultural styles are studied which are the Moroccan, Egyptian, Shami and Khaliji. Three sets of acoustic features are investigated together with supervised classifiers to identify the cultural style of a song. Moreover, feature selection algorithms are employed to identify the most suitable subset of features for classification. An overall accuracy of 81% is reached for the classification of the four styles using a Decision Tree classifier after applying the relief feature selection algorithm.

Keywords—Music Retrieval; Music Classification; Arabic Cultural Style; Feature Extraction.

Binary Dragonfly Algorithm for Feature Selection

Majdi Mafarja, Seyedali Mirjalili, Derar Eleyan and Iyad Jaber

Abstract—In this paper, a wrapper-feature selection algorithm based on the binary dragonfly algorithm is proposed. Dragonfly algorithm is a recent swarm intelligence algorithm that mimics the behavior of the dragonflies. Eighteen UCI datasets are used to evaluate the performance of the proposed approach. The results of the proposed method are compared with those of Particle Swarm Optimization (PSO), Genetic Algorithms (GAs) in terms of classification accuracy and number of selected attributes. The results show the ability of Binary Dragonfly Algorithm (BDA) in searching the feature space and selecting the most informative features for classification tasks.

Keywords—Feature Selection; Optimization; Dragonfly Algorithm, classification.

Reconfigurable Implementation of Fuzzy Inference System Using FPGA

Mehdi Mohammadi and Adnan Shaout

Abstract—Hardware implementation of algorithms is always considered to accelerate them. Fuzzy inference system (FIS) is applicable when the mathematical description of a system is inaccessible or system description is complicated and better to be described in linguistic terms. Current hardware implementation approaches requires some extended level of hardware knowledge. In this paper, we investigated current approaches in the field of FPGA-based Fuzzy controllers then a two-input generic FIS module is introduced as a baseline for constructing complicated tree based structure controller. This configurable module is independent of target hardware and needs no information about target architecture. Finally, implementation results show the benefit of this methodology in terms of speed, power, and silicon area.

Keywords—FIS, TISO, FPGA, IP core, tree-based FIS, HDL.

CNN-Based Prediction of Frame-Level Shot Importance for Video Summarization

Mohaiminul Al Nahian, A. S. M. Iftekhar, Mohammad Tariqul Islam, Dr. S. M. Mahbubur Rahman and Dimitrios Hatzinakos

Abstract—In the Internet, ubiquitous presence of redundant, unedited, raw videos has made video summarization an important problem. Traditional methods of video summarization employ a heuristic set of hand-crafted features, which in many cases fail to capture subtle abstraction of a scene. This paper presents a deep learning method that maps the context of a video to the importance of a scene similar to that is perceived by humans. In particular, a convolutional neural network (CNN)-based architecture is proposed to mimic the frame-level shot importance for user-oriented video summarization. The weights and biases of the CNN are trained extensively through off-line processing, so that it can provide the importance of a frame of an unseen video almost instantaneously. Experiments on estimating the shot importance is carried out using the publicly available database TVSum50. It is shown that the performance of the proposed network is substantially better than that of commonly referred feature-based methods for estimating the shot importance in terms of mean absolute error, absolute error variance, and relative F-measure.

Two Stage Intelligent Automotive System to Detect and Classify a Traffic Light

Adnan Shaout, Nevrus Kaja and Omid Dehzangi

Abstract— With the commercialization of autonomous vehicles and advanced automotive systems, the problem of detecting and classifying objects has become a crucial issue. The objective of this paper is to detect and classify a traffic light from a scenery image. Different from the majority of other works, the proposed system will do this in two stages. The first one explores the feature extraction process in a set of images containing one or more traffic lights. This process focuses on detecting true positive areas where the traffic lights are and it is done through a six substage classifier using an ensemble of weak learners. The second stage obtains the input from the first stage, extracts its features and classifies them. The output of the second stage is a general classification for the color of the best traffic light found in the image scenery. The proposed recognition system is a robust, reliable and intelligent system with high rates of predictability.

Keywords— expert systems, feature extraction, classification, machine learning, computer vision

Evaluating the Performance of “Derandomized-LShade” Algorithm on CEC 2014 Benchmark Functions

Raghda Hraiz, Mostafa Ali and Mariam Khader

Abstract— In this paper, a hybrid global optimization algorithm is proposed. The new algorithm Derandomized-LShade (DLShade), exploits derandomization characteristics of the Covariance Matrix Adaptation Evolutionary Strategy (CMA-ES) to enhance the performance of L-SHADE algorithm. The performance of DL-SHADE has been evaluated on the benchmark functions of CEC2014 Competition. Also, DL-Shade efficiency has been compared with L-SHADE and CMA-ES. Comparison results show that the proposed algorithm takes the good features from both algorithm and it was able to outperform both of them.

Keywords— Covariance Matrix Adaptation Evolutionary Strategy (CMA-ES); Differential Evolution (DE); Adaptation, LSHADE; SHADE; JADE;

A Novel Cloud Services Recommendation System Based on Automatic Learning Techniques

Rahma Djiroun, Meriem Amel Guessoum, Kamel Boukhalfa and Elhadj Benkhelifa

Abstract— Today's, Cloud Computing has evolved and offers distinct cost saving opportunities by consolidating and restructuring information technology services. As the increasing numbers of various Cloud services are rapidly evolving in the Cloud. Therefore, the cloud users have difficulties to find the best relevant services from many and various services in an optimal time. So, select the best relevant services by cloud user's will be a great challenge. In this context, a services recommendation system will be necessary to help cloud users to find and select services that matches his\her requirements. In this paper, we present a framework of services' recommendation system in the Cloud using automatic learning techniques. The system aims to find the services that suit the interests and preferences of cloud user's and facilitate the selection of the most relevant of them. We present also, the tool USTHB-CLOUD and some experiments.

Keywords— Cloud Services; Recommendation systems; Automatic learning techniques; Data mining.

Statistical Selection of CNN-Based Audiovisual Features for Instantaneous Estimation of Human Emotional States

Ramesh Basnet, Mohammad Tariqul Islam, Tamanna Howlader, S. M. Mahbubur Rahman and Dimitrios Hatzinakos

Abstract—Automatic prediction of continuous-level emotional state requires selection of suitable affective features to develop a regression system based on supervised machine learning. This paper investigates the performance of features statistically learned using convolutional neural networks for instantaneously predicting the continuous dimensions of emotional states. Features with minimum redundancy and maximum relevancy are chosen by using the mutual information-based selection process. The performance of frame-by-frame prediction of emotional state using the moderate length features as proposed in this paper is evaluated on spontaneous and naturalistic human-human conversation of RECOLA database. Experimental results show that the proposed model can be used for instantaneous prediction of emotional state with an accuracy higher than traditional audio or video features that are used for affective computation.

Link Prediction Based on Whale Optimization Algorithm

Reham Barham and Ibrahim Aljarah

Abstract—Link prediction problem has a wide variety of useful applications in diverse fields. For example, in bioinformatics, such as protein-protein interaction metabolic and diseases-gene networks, there are links between nodes, which indicate they have an interaction relationship. This paper presents a possible solution to the well known 'link prediction problem' using a Whale Optimization algorithm (WOA), which is considered as one of the recent optimization algorithms. The link prediction problem is formulated as an optimization problem to predict the links in any type of the networks. Experimental results of the proposed algorithm (WOA-LP) on a number of real networks are good evidence that the proposed approach can enhance the link prediction accuracy.

Keywords— Algorithm, Heuristic, Link Prediction, Optimization, Social Network Analysis, Association, Whale Optimization Algorithm, WOA

Motor Imagery EEG Signal Processing and Classification using Machine Learning Approach

Sreeja S R, Joytirmoy Rabha, Nagarjuna K Y, Debasis Samanta, Pabitra Mitra and Monalisa Sarma

Abstract—Motor imagery (MI) signals recorded via electroencephalography (EEG) is the most convenient basis for designing brain-computer interfaces (BCIs). As MI based BCI provides high degree of freedom, it helps motor disabled people to communicate with the device by performing sequence of MI tasks. But inter-subject variability, extracting user-specific features and increasing accuracy of the classifier is still a challenging task in MI based BCIs. In this work, we propose an approach to overcome the above mentioned issues. The proposed approach follows the pipeline such as channel selection, band-pass filter based CSP (common spatial pattern), feature extraction, feature selection using two different techniques and modeling using Gaussian Naïve Bayes (GNB) classifier. Since the optimal features are selected by feature selection techniques, it helps to overcome inter-subject variability and improves performance of GNB classifier. To the best of our knowledge, the proposed methodology has not been used for MI-based BCI applications. The proposed approach is validated using BCI competition III dataset IVa. The results of our proposed approach is compared with two conventional classifiers such as linear discriminant analysis (LDA) and support vector machine (SVM). The results prove that the proposed method provides an improved accuracy than LDA and SVM classifiers. The proposed method can be further developed to design a reliable and real-time MI-based BCI application.

Keywords—Motor Imagery, BCI, EEG, feature extraction, feature selection, machine learning.

Using Fuzzy method for Decision Making in Local Government

Bashar Hwaidi

Abstract—Decisions made by local governments must be made in a way that is consistent with the local government principles. These principles are: transparent and effective processes, sustainable development and management of assets and infrastructure, democratic representation and good governance. As we know, how to operate a successful decision is a crucial task. A good or successful decision making depends on many factors. Because of the current evaluation process is subject to various degrees of opinions and preferences, ranking and prioritization are difficult as a result of uncertainty inherent and fuzzy environment. We propose using a fuzzy decision scheme to provide evaluation degrees with more precision. This paper is to apply the above four principles using a new method for obtaining an effective and successful decision. Firstly, a questionnaire with several factors is going to be distributed and collected from decision makers. Then, Fuzzy LinPreRa method is used to evaluate the importance of these alternatives. The proposed algorithm yields decision matrices for making pair-wise comparisons. Only $n-1$ comparison judgments (decision makers) are required to ensure consistency on a level that contains n alternatives. The evaluation can provide important information for stakeholders to make a consistent and successful decision.

Keywords— Multi Criteria Decision Making (MCDM), Fuzzy LinPreRa, AHP, decision making

A New Technique for File Carving on Hadoop Ecosystem

Esraa Al Shammari, Ghazi Al-Naymat and Ali Hadi

Abstract—using file carving techniques is one of most recent techniques that is used to retrieve the important data from unallocated space in a corrupted file system. In the traditional operating systems, such as Windows or Linux that have a small size of hard disk to store data, the researchers implemented many file carving techniques to carve a specific type of files (e.g. PDF, JPEG... etc.). However, with the presence of a specially designed file system that stores a huge volume of data, namely Hadoop Distributed File System (HDFS), the carving techniques should be established to recover the minimum amount of data corrupted by attackers considering the HDFS capabilities. In this research, we propose a framework, which encompasses different steps working together as a new carving technique to retrieve the most possible pieces of files that are corrupted by 10%, and to ensure that the files are successfully carved.

Keywords— Carving Technique, Data Recovery, File System, Hadoop Ecosystem.

A Survey of IT Outsourcing in Jordanian Market

Abdallah Qusef and Nisreen Raeq

Abstract— the massive elevation of globalization raised the competition between companies. That compelled business owner to demand more focusing on core business and trying to get access to greater number of resources with minimum cost. That made outsourcing one of the proposed solutions for this purpose. This survey paper highlights the definition of outsourcing, its strategies, advantages and disadvantages. In addition, it conducts a survey on 32 people who is working in the Information Technology field in Jordan.

Keywords—Project Management, outsourcing, globalization

Cache Optimization in IPTV Network Using Big Data Analytics and Mobile Agent Technology

Hasan Al-Sakran

Abstract—with the recent advances in Internet Protocol television network and client TV device's technologies the demand for new services for TV viewers is increasing. One of such services is providing TV contents at convenient to subscribers time and locations. In order to deliver real-time contents streaming to multiple subscribers a considerable amount of network bandwidth is required due to the large volume of unicast traffic over an IPTV network. To address some of these challenges, we propose a new model for content caching that takes advantage of the cooperation among distributed caches containing most recommended contents in Digital Subscriber Line Access Multiplexers (DSLAM), Central Office (CO), and Intermediate Office (IO) caches. The objective of this study is to explore the opportunities of using big data analytics in The IPTV industry system to significantly improve the quality of services, to become more competitive, and enhance capability to offer contents to viewers. Content providers need to make sure their viewers get the best experience possible. Our model considers the viewer's content preferences based on the favorite programs as well as the event-based analytics using the recommendation algorithm. It employs agent technology to move all or part of the cache allocated to a client TV device on a corresponding DSLAM to the TV client or, if desired, content has not found on DSLAM, from upper level (CO and IO) to the DSLAM of the TV client

Keywords— Big Data; Mobile agents; cache relocation; IPTV network; CO; IO; VHO

A Framework for Real Time News Recommendations

Jalal Omer Atoum and Ibrahim Mohamed Yakti

Abstract—The fast growth of technology in both software and hardware levels resulted in moving several industries such as media, news, publishing, printing, and entertainment from classic approach to more digital approach. Thus, creates the need to understand the audience and their behaviors toward their products, advertising campaigns, or services to increase their growth and improve satisfaction of both readers and publishers. This paper proposes a framework for recommending content for news websites to users in real time to increase both user and business satisfactions using academic and news industry standards, it starts with gathering data and ending with delivering personalized recommendations per user. Results showed an improvement of users' engagement when such recommendation system was active.

Keywords— Search Engine Optimization, Web Recommendation Systems, Website Users Engagement, Bounce rate pageviews

Development of Customs Prediction Model for Online Ordering

Lina Sharawi, Hamzah Qabbaah, George Sammour and Koen Vanhoof

Abstract— As a result of the rapid increase of online shopping, and the movement of products in and out among the countries, the governments made it mandatory to pay a certain amount of money referred to as customs to maintain each country's economy, based on some rules i.e. weight and price. This paper proposed a model to anticipate and inform the customer if his order is going to be subject to customs. The model was built using software called SPSS and data mining techniques; Decision Tree (DT) and logistic regression. A comparison between the two data mining techniques was made and DT results were better than the logistic regression.

Keywords— Data mining; Customs; Decision tree; Logistic regression; Classification measures

Optimized ANN-ABC for Thunderstorms Prediction

Mais Yasen, Ruba Al-Jundi, and Nailah Al-Madi

Abstract— The inaccurate forecasting of weather poses a danger to aviation, which increases the need to build a good prediction model. Artificial Neural Network (ANN) is one of the evolutionary computation techniques that is used for classification process, which has proven its efficiency especially for dynamic and nonlinear classification. The ANN training method implemented is backpropagation which is used in conjunction with an optimization method. Artificial Bee Colony (ABC) algorithm is used in several optimization problems, including the optimization of synaptic weights from an ANN. In this research, we present the use of ABC as an optimization algorithm for the weights of each connection between the ANN neurons in a model we call ANN-ABC. This research proposes a thunderstorm prediction model that makes use of ANN-ABC and takes real data of Lake Charles Airport (LCH) as a case study. The proposed model is evaluated using different metrics, and compared with other well-known classifiers. To evaluate the fitness of the produced model we used and compared three fitness functions for ABC process; Accuracy, AUC, and F-measure. The results show that ANN-ABC/Accuracy got the best detection of normal days. Where ANN-ABC/AUC got the best detection of thunderstorms.

Keywords— Weather Prediction; Machine Learning; Evolutionary computation; Artificial Bee Colony Algorithm; Artificial Neural Network; Optimization

Arabic Sentiment Classification: A Hybrid Approach

Mariam Biltawi, Ghazi Al-Naymat and Sara Tedmori

Abstract— The goal of this paper is to propose a sentiment analysis approach for the Arabic language that combines lexicon based and corpus based techniques. The main idea of this approach is to represent the review for the corpus-based approach in the same way it is seen in lexicon-based approach, through replacing the polarity words with their corresponding label Positive 'POS' or Negative 'NEG' in the lexicon, this way the terms that are important but rare can be taken into consideration by the classifier. A comprehensive comparison is conducted using different classifiers, and experimental results showed that the proposed hybrid approach outperformed the corpus-based approach and the highest accuracy reached 96.34% using random forest classifier with 6-fold cross validation.

Keywords—Arabic sentiment analysis; supervised learning; lexicon and corpus based; Natural Language Processing; data science

LSHADE Enhancement Using MTS-LS1

Marwah Alian, Dima Suleiman and Mostafa Ali

Abstract—Differential Evolution (DE) has been considered as an effective approach for solving numerical optimization problems. Due to different characteristics of optimization problems, many proposed algorithms try to perform consistently over a range of problems. The proposed algorithm combines both LSHADE and MTS-LS1 by giving both a participation ratio of the fitness evaluation where each technique works until finishing its participation budget or reaching the optimum solution. Using hybrid model gives an opportunity to achieve better performance for both algorithms. The evaluation of this algorithm has been tested using CEC 2014 benchmark problems.

Keywords— Evolutionary algorithms, differential evolution; single objective optimization;

The Effects of Features Selection Methods on Spam Review Detection Performance

Wael Etaiwi and Arafat Awajan

Abstract—Online reviews become a valuable source of information that indicates the overall opinion about products and services, which may affect decision-making processes such as purchase a product or service. Fake reviews are considered as spam reviews, which may have a great impact in the online marketplace behavior. Extracting useful features from review's text using Natural Language Processing (NLP) is not a straightforward step, in addition, it affects the overall performance and results. Many types of features could be used for conducting this task such as Bag-of-Words, linguistic features, words counts and n-gram feature. In this paper, we will investigate the effects of using two different feature selection methods on the spam reviews detection: Bag-of-Words and words counts. Different machine learning algorithms were applied such as Support Vector Machine, Decision Tree, Naïve Bayes and Random Forest. Experiments were conducted on a labeled balanced dataset of Hotels reviews. The efficiency will be evaluated according to many evaluation measures such as: precision, recall and accuracy.

Keywords— Spam reviews; feature selection; machine learning; spam detection

Passive DNS Analysis Using Bro-IDS

Ali Hadi, Ja'afar Saraireh, Abdulla Dakhgan and Doaa Rababh

Abstract—DNS environment is a rich of interesting data that can be analyzed to extract some benefits information for different security aspects. The DNS traffic is a good environment for attackers to reach their malicious goals. A lot types of attacks are carried out using the DNS traffic such as Fast flux, DNS cache poisoning and spoofing, and amplification of DNS for DDoS attack. This paper tries to answer the question: to what degree should the companies take care of DNS traffic and how can the Industry have benefits from analysis of DNS and passive DNS. This paper presents some analyzed data of DNS traffic, we have a Data Set, we used a tool called BRO to extract DNS log from the Data Set and then we use tools to make some statistics and extract some passive DNS data. The result of analyzing shows some extracted statistics about hosts, ports, protocols, visited domains, and number of queries.

Keywords— BRO-IDS;DNS; Passive DNS; DNS Traffic

An Efficient Two Server Authentication and Key Exchange Protocol

Durbadal Chattaraj, Monalisa Sarma and Debasis Samanta

Abstract—To avail networked services via insecure channel, it is necessary to establish a symmetric key between two parties. In such a provision, both the end parties demand proper auditing so that resources are legitimately used, and privacies are maintained. To achieve this, there is a need for a robust authentication mechanism. Towards the solution, a number of password based Diffie-Hellman authentication and key exchange protocols have been reported recently. However, they are vulnerable to many security threats such as man-in-the-middle attacks, replay attacks, byzantine attacks, dictionary attacks, single point of vulnerability, etc. This work proposes an authentication protocol addressing the major limitations in the existing protocols. In our proposed protocol, we introduce a password-based two server authentication and key exchange mechanism which is resilient to many security attacks and preserves server-side user privacy. Our proposed protocol can be considered as a robust authentication protocol for a secure access to Cloud services.

Phishing Website Prediction using different classification techniques

Dyana Ibrahim and Ali Hadi

Abstract— Phishing is an important issue that faces the cyber security. This paper exploits the capability of the classification technique on Phishing Website Prediction (PWP) purpose and introduces methodology to secure the users from the attackers. Because the blacklist procedure isn't a strong enough way to stay safe from the cybercriminals. The phishing website indicators have to be considered for this purpose, with the use of existence of machine learning algorithms. Five different classification techniques have been used to evaluate their efficiency on (PWP) in terms of accuracy and the error value of each one of them, with and without the feature selection process. Weka tool was used for the implementation of these classifiers on a public dataset from NASA Repository. The motivation behind this investigation is to employ a number of Data Mining (DM) algorithms for the prediction purpose of phishing websites and compare their effectiveness in terms of accuracy and error rate. Where DM classifiers have proved their goodness in this kind of problems.

Keywords— Data mining; feature selection; machine learning; optimization algorithms; phishing website; prediction; supervised algorithms.

Smart Parser for Identifying and Detecting Insecure Functions

Esra'A Alshammari, Ali Hadi and Malik Qasaimeh

Abstract— Buffer overflow is a known attack that exploits the software vulnerabilities by injecting an arbitrary code to gain a full or partial control on the targeted machine. Usually, the attackers target the C/C++ software applications that consist of insecure functions to overfill the buffer and crash that software. Thus, they cause a memory corruption, and run their arbitrary code. Several approaches have been developed to detect the buffer overflow. Those approaches rely mainly on static and dynamic analysis of the source code and generally require expertise in formal analysis and modeling of the source code and in some cases familiarity of binary code analysis. This paper proposes a smart parser that able to detect the C/C++ insecure functions that could be exploited by the buffer overflow attack. The smart parser is expected to be integrated with the early phase of the coding process as to help the software developers to coding their application securely. The smart parser has been implemented using Python and evaluated on five different applications that are written in C/C++ language. Additionally, the smart parser generates a report that shows the numbers and types of insecure functions that are found in each application.

Keywords— Buffer Overflow, Insecure Code, Unsafe Functions C/C++

State of the Art in Computer Forensic Education-A Review of Computer Forensic Programmes in the UK, Europe and US

Georgios A. Dafoulas, David Neilson, Sukhvinder Hara

Abstract— This paper provides an early review of several undergraduate programmes for the purposes of the EU funded Pathway in Forensic Computing (FORC) project. FORC aims to address the challenges in information society development concerned Cyber Security and privacy in a world oriented towards e-technologies. The project meets the regional needs of the Middle East area by responding to the current and emerging cyber security threats by educating the IT and Legal professionals in the field of e-crime, thus supporting development of e-based economics, life and society in partner countries. The work is funded under project reference number 574063-EPP-1-2016-1-IT-EPPKA2-CBHE-JP, Grant Agreement 2016 – 2556 / 001 – 001. In this paper we focus on the second work package of the project (WP-2) aiming to ‘establish a forensic computing pathway’ and the first task for this work package aiming at ‘defining pathway objectives, learning outcomes, and career perspective’.

Keywords— Computer Forensics, Emerging trends in computer forensics, Computer Science Education, Curriculum Development, Curriculum Design

Threat Hunting using GRR Rapid Response

Hussein Rasheed, Ali Hadi and Mariam Khader

Abstract— Cybercrimes have evolved, and their tactics and techniques are increasingly changing with an alerting pace. This calls for a change in the mindset used to implement security measures into adopting the approach of continuously and constantly looking for attacks that pass through the deployed security solutions. This approach of searching through the networks for any evidence on threat activity, rather waiting for a breach notification is referred to as cyber threat hunting. This paper discusses the deployment of threat hunting process using GRR Rapid Response and conducting two experiments, in which, both remote code execution, client side exploits are tested, and successful exploitation was used to configure a backdoor to the victim’s system to achieve persistence. The experiments show that threat hunting can be achieved by the study of the monitored system’s normal patterns of behavior, which will help identify the indications and thresholds that can be used in threat hunting.

Keywords— IoC; GRR Rapid Response; Threat Hunting; Threat Intelligence

Differentially Private Stochastic Variance Reduced Gradient

Jaewoo Lee

Abstract—In this paper, we propose a differentially private stochastic variance reduced gradient algorithm, called DP-SVRG. To privatize SVRG algorithm, we randomize the gradient computation process by injecting random noise. There are two main challenges in this approach: (i) high variance of stochastic gradient updates, and (ii) low per-iteration privacy budget. To cope with these challenges, we employ two advanced techniques recently introduced in the literature. First, we apply control variate technique to stochastic gradient update, shown to effective in reducing the variance. Second, we use the tight composition theorem of zero-concentrated differential privacy (zCDP) to effectively bound the cumulative privacy cost. To show the effectiveness of the proposed algorithm, we conduct empirical evaluations on a set of real datasets and compare with other algorithms.

Experimental Evaluation of a Multi-Layer Feed-Forward Artificial Neural Network Classifier for Network Intrusion Detection System

Malek Al-Zewairi, Sufyan Almajali and Arafat Awajan

Abstract—Deep Learning has been proven more effective than conventional machine-learning algorithms in solving classification problem with high dimensionality and complex features, especially when trained with big data. In this paper, a deep learning binomial classifier for Network Intrusion Detection System is proposed and experimentally evaluated using the UNSW-NB15 dataset. The evaluation results demonstrate that it outperforms other models in the literature with 96% recall on unseen data and 0.56% false alarm rate.

Keywords— Deep Learning; Network Security; Intrusion Detection System; UNSW-NB15; H2O;

A Proposed Password-free Authentication Scheme Based on a Hybrid Vein-Keystroke Approach

Maria Habib and Ja'Far Alqatawna

Abstract—The traditional static password-based authentication schemes are insufficient to fully protect user privacy. They suffer from various usability and security issues which are usually utilized by online criminals to obtain users' passwords and control their accounts. In 2014 more than 4.9 million Gmail accounts have been compromise and published online. As a response to such incidents security researchers have started to investigate other alternative authentication methods. Currently there is a growing body of research to improve user authentication based on physiological and behavioral biometrics. In this paper we review the literature and discuss several related studies. Additionally, we propose the use of free-password authentication scheme using vein recognition at the login stage and keystroke dynamics as a continuous authentication during the user session.

Keywords— Behavioral Biometric, Physical Biometric, Multi Modal, Static and Continuous Authentication, Identity Management.

Visualizing Clustered Botnet Traffic using t-SNE on Aggregated NetFlows

Muayyad Alsadi and Ali Hadi.

Abstract—Dimensionality reduction techniques can be used to visualize high dimensionality data. In this paper, the use of such techniques has been studied to reduce the dimensionality of botnet data so that can visualize it. Visualization process helps identifying botnet traffic from normal traffic using NetFlows only, in order to define a way to aggregate and extract the feature from known datasets. The key for aggregating flows method used in this paper is composed of protocol (TCP/UDP/ICMP), source address, and destination address and destination port. The source port is not part aggregation key to derive features from it. The tDistributed Stochastic Neighbor Embedding (t-SNE) is used for transform of dataset in distinct clusters of behaviors: Normal behaviors, botnet behaviors, and common behaviors. The proposed method would allow researchers to know where to start when they are handled thousands or millions of NetFlows.

Keywords— Botnet, Clustering, Feature selection, Machine learning, NetFlows.

An Efficient E-Coin Scheme Under Elliptic Curve Cryptography

Mustafa Al-Fayoumi, Sattar Aboud, Mohammad Al-Fayoumi, and Jaafer Al Saraireh

Abstract— E-commerce is the new growing technology in the field of trade systems. One of novelty technologies in such area, is an e-coin scheme. The e-coin transfer scheme denotes a practical innovation which allows to complete the e-operations. In this paper, it presents an efficient e-coin scheme based on an elliptic curve. In order to secure the incorrupt clients of an e-coin scheme should utilizes the blind signature protocol. The proposed scheme requires a trusted authority to trace the corrupt participants. It claims that the proposed scheme is more efficient compare with already existed schemes.

Keywords— e-commerce, e-payment scheme, wireless network, cryptography, elliptic curve, digital signature.

Novel Algorithm in Symmetric Encryption (NASE): Based on Feistel Cipher

Safiah I. Bani Baker and Alaa Hussein Al-Hamami

Abstract— Protecting the confidentiality of digital data stored on computer systems, data transmitted via the Internet or other computer networks is the primary aim of encryption. Modern encryption algorithms play a vital role in the security assurance of Information Technology Systems and communications as they can provide confidentiality, Authentication, Integrity, and Nonrepudiation. In the present paper, we propose NASE as a novel algorithm of data blocks encryption based on Feistel cipher structure with new added features by which enhancing the security of the encrypted data. NASE consists of generating random number of block size, random number of iterations and different keys for each block generated automatically. The proposed algorithm works for more than one language (e.g., English, Arabic, etc) and it is possible to use double or triple encryption with different keys for more security. In addition to the complexity of the algorithm, it is very fast and it applies easily for different applications.

Keywords— Random Generator; Zip; Encryption; Decryption; Symmetric Encryption; Asymmetric Encryption; Block; Meta data.

Toward a Detection Framework for Android Botnet

Wadi' Hijawi, Ja'Far Alqatawna and Hossam Faris

Abstract—Android is one of the most popular and widespread operating systems for smartphones. It has several millions of applications that are published at either official or unofficial stores. Botnet applications, kind of the malware applications, may be published using these stores and downloaded by the victims on their smartphones. Machine Learning (ML) methodologies have been used to build models for detecting botnet applications using various extracted features sets. In this paper, we proposed a new set of predefined permissions categories features then we compared the performance results before and after adding these features to the all available requested permissions features in the Android. We used four popular ML classifiers (i.e. Random Forest (RF), Multi Layer Perceptron neural networks (MLP), Decision trees (J48), and Naive Bayes) for our experiments and we found that the new set of features have a tiny improvement on the performance in the case of J48 and RF classifiers.

Keywords— Android Botnet Detection, Android Botnet Features, Data Mining, Machine learning

Securing Distributed SDN Controllers against DoS Attack

Wael Etaiwi, Mariam Biltawi and Sufyan Almajali

Abstract— Software-defined networking (SDN) is an agile and flexible computer network architecture that allows a quick and efficient response by the network administrator to any changes. A Distributed SDN Controllers architecture is more effective and scalable with higher availability. This paper proposes a distributed controller approach to detect Denial of Service (DoS) attacks in SDN network and recover attacked controller. To address DoS attacks efficiently, the approach proposes a protocol with several components including a mapping algorithm, heart-beat messages, synchronization messages, take-over process, and protective mode. Besides the DoS attack, the proposed approach addresses several concerns that come with it. The proposed approach has been applied and tested on mininet simulator.

Keywords— Software defined network; Distributes controllers; denial-of-service.

Arabic LFG-inspired Dependency Treebank

Dana Halabi, Arafat Awajan and Ebaa Fayyumi

Abstract— For the data-driven approach in Natural Language Processing (NLP) applications, good quality linguistic resources considered as a main factor to obtain good results. Although Arabic language is one of the main languages in the world, it is considered as low-resourced language in term of good quality and free linguistic resources. This work presents the first stage of building a new open source dependency treebank for Arabic language. It describes the prototype of the new dependency treebank that are inspired by Lexical Functional Grammar (LFG). This paper shows a main approach of developing a newly treebank and put lines the future work needed to complete this novel linguistic resource.

Keywords— linguistic resources, LFG, dependency treebank, morphological analysis, syntactic analysis, data-driven NLP applications.

Deep Learning Based Techniques for Plagiarism Detection in Arabic Texts

Dima Suleiman, Arafat Awajan and Nailah Al-Madi

Abstract—Plagiarism detection is very important especially for academicians, researchers and students. Although, there are many plagiarism detection tools, it is still a challenging task because of the huge amount of online documents. In this research, we propose to use word2vec model to detect the semantic similarity between words in Arabic language which can help in detecting plagiarism. Word2vec is a deep learning technique that is used to represent words as features of vectors with high precision. The quality of vectors representation depends on the quality of corpus used in the training phase. In this paper, we used OSAC corpus for training the word2vec model. Moreover, cosine similarity measure is used to compute the similarity between words' vectors. The similarity measures show how simple changes in text such as changing one word, or changing the position of verbs and nouns result in a similarity value equal to 99% which provides the possibility to detect plagiarism even if the text is altered by replacing words by their synonyms or changing the words order.

Keywords— Similarity detection; Arabic Language Processing; Word2Vec; Deep Learning; plagiarism.

Building Domain Ontology: Experiences in Developing the Prophetic Ontology

Hanan A. Al-Sanasleh and Bassam H. Hammo

Abstract— Ontologies have been designed for the purpose of representing a domain of knowledge in a way that makes it understandable by machines and humans. Ontologies have been used in many areas in computer sciences such as knowledge engineering, semantic web, and information retrieval. Religious studies is one of the areas where ontologies are in demand. In this paper, we present the design of domain ontology about prophets and messengers in Islam from trustworthy resources: the Quran and Hadith. The ontology can be used to better understand all life aspects of prophets and messengers in Islam. The classes, relations and properties of this special domain ontology were gathered and integrated to help researchers to identify and explore knowledge about prophets in Islam such as their lives, books and teachings, the nature of the messages they brought to their nations and tribes and much more.

Keywords— ontology; knowledgebase; prophets; Islam; conceptualization; semantic web; Quran and Hadith

Using Hybrid-Stemming Approach to Enhance Lexicon-based Sentiment Analysis in Arabic

Hunaida Awwad and Adil Alpkocal

Abstract— The objective of this article is to present a hybrid-stemming approach to enhance lexicon based sentiment analysis (SA) in Arabic in both sentence-level and document-level. The new approach uses root-based and light stemmers together to enhance the likelihood of finding sentiment words. We applied the proposed hybrid-stemming approach into two datasets and four lexicons, and we provided a comparison with root-based stemmer and light stemmers individually. The results we obtained demonstrate that the presented hybridstemming approach is more accurate than both root-based stemmers and light stemmer when they are using separately for sentiment analysis in Arabic.

Keywords— Sentiment analysis; Lexicon-based; Arabic; Stemming; Negation; Intensification

Arabic Word Sense Disambiguation – Survey

Marwah Alian, Arafat Awajan and Akram Al-Kouz

Abstract— One of the central challenging and most difficult problems in Natural Language Processing is the capability to identify what a word means with respect to a context in which it comes into view. This problem is called Word Sense Disambiguation (WSD). It is ubiquitous across all languages but it has greater challenges in Semitic languages like Arabic language. In this paper we present what researches have been done to solve the problem of Arabic word sense disambiguation.

Keywords— Word Sense Disambiguation; Natural Language processing; Arabic Word Sense Disambiguation

Building Arabic Polarized Lexicon from Rated Online Customer Reviews

Mohammad Daoud

Abstract— Building a polarized lexicon is an essential step towards a reliable opinion mining engine. In this paper we are presenting an approach and describing an experiment to build an Arabic polarized lexicon from analyzing online customer reviews. These reviews are written in Modern Standard Arabic and Palestinian/Jordanian dialect. Therefore, the produced lexicon comprises casual slangs and dialectic entries used by the online community, which is useful for sentiment analysis of informal social media microblogs. We have extracted 28000 entries from processing 15100 reviews and by expanding the initial lexicon with through google translate. Each entry was given a polarity tag and a confidence score. High confidence scores have increased the precision of the polarization process.

Keywords— Polarized lexicon; social media analysis, opinion minin; term extraction

Detecting Quotable Sentences from Text Using Syntactic Token Augmentation and Recurrent Neural Networks

Sumit Terkhedkar and Janak Porwal

Abstract— From the beginning of the literary era, ‘Quotations’ are inspiring writers and avid readers. The information outburst started right from the printing of books to digitization of such media, hints towards the innumerable occurrences of unexposed quotations. In this paper, we explore an approach to detect and extract quotable sentences from large text corpses. Our findings, after analyzing the quotations from the gold standard sources suggests, the quotable sentences can be detected with their intrinsic properties of sentence structure and style of speech that makes the quotations meaningful, concise, and effective. However, the subjectivity of this property makes this problem convoluted than any other binary text classification problem. To resolve that, we describe a method to preserve sentence semantics during the process of filtering and classification of sentences. Our language model with Recurrent Neural Networks outperform the other approaches to detect quotations with 84.30% accuracy, which is a significant 2.8% improvement with our own statistical model. The work also adds to the understanding of the impact of manually designed features on text classification problems.

Keywords—Discourse Detection; Recurrent Neural Networks; Long Short Term Memory; Natural Language Processing.

Software Defect Prediction Using Feature Selection and Random Forest Algorithm

Dyana Rashid Ibrahim, Rawan Ghnemat, and Amjad Hudaib

Abstract— Software testing is the most important task in software production and it takes a lot of time, cost and effort. Thus, we need to reduce these resources. Software Defect Prediction (SDP) mechanisms are used to enhance the work of SQA process through the prediction of defective modules, many approaches have been conducted by researchers in order to predict the fault proneness modules. This paper proposed an approach for the SDP purpose, it employs two existed algorithms to have a high performance, that are the Bat-based search Algorithm (BA) for the feature selection process, and the Random Forest algorithm (RF) for the prediction purpose. This paper also has tested a number of feature selection algorithms and classifiers to see their effectiveness in this problem.

Keywords— Software Defect Prediction (SDP); machine learning; metaheuristic algorithms, classification; Random Forest (RF); Feature Selection (FS); Bat search Algorithm (BA)

Requirements Prioritization Techniques Review and Analysis

Raneem Qaddoura, Alaa Abu Sarhan, Mais Haj Qasem and Amjad Hudaib

Abstract—Requirements prioritization is considered as one of the most important activity in the requirement engineering process. This paper gives an overview of the requirements prioritization activities and techniques. It also presents how data mining and machine learning techniques have been used to prioritize the software project requirements. A comparison between these techniques is also presented.

Keywords— Requirements, Requirements Engineering, Requirements Prioritization Techniques

Screen size effect on usability of Arabic forms for smartphones

Rihabb Salamin and Ghassan Shahin

Abstract— Researchers have established a concrete and solid ground for web forms design and their usability testing since the nineties. However, since the dramatic shift towards devices that carries a varied set of properties, such as, smartphones and tablets, developers started to build forms to suit these devices. As a consequence, a radical shift in research and usability testing needed to strike as well. We attempt to work with Arabic forms that are designed particularly for mobile devices (smartphones to be exact). Our goal, was to come up with empirically tested usability guidelines for Arabic mobile forms through achieving a set of objectives. Firstly, we have investigated the effect of smartphones screen size on error rate. In other words, do smaller screens increase the number of errors made by the users during form filling tasks? Secondly, we have addressed the following question: what is the best location for an error message to appear on smartphones' forms? The above issues as come to our knowledge never been addressed before for Arabic smartphones' forms. We have reached that conclusion after a detailed literature review. Our results have revealed the existence of a negative relationship between screen size and number of errors, users are less likely to make errors when the screen is big. As to the best location to display an error message, we tested a variety of locations. Our findings indicated that for a smartphone that has a small screen, below text box is the best location for a message to be shown. Pop up messages comes next but it scored the worst regarding subjective preferences.

Keywords— Usability; usability testing; forms; error message presentation; error message design

A Survey: Authentication Protocols for Wireless Sensor Network in the Internet of Things; Keys and Attacks

Doa'a Alrababah, Esraa Alshammari and Areej Alsuh

Abstract— Internet of things (IoT) is a new technology that enables things in a specific environment to communicate with each other's over the internet. Objects need to communicate wirelessly with each other, so IoT includes wireless sensor networks (WSN), radio frequency identification (RFID), near field communication (NFC), and many to facilitate the communication process. WSN is a network of connected nodes use sensors to collect and share data between each other. In order to build heterogeneity IoT environments, Wireless Sensor Networks should be established to monitor and record activities of connected things. Standard security protocols are used to provide a seamless and secure connection in Wireless Sensor Networks, especially authentication and access control of nodes. In this paper, the importance of security issues within IoT-WSN environment highlighted, by providing a description for some existing authentication protocols used in wireless sensor network. Additionally classifies the chosen protocols according to types of secret key used to achieve their goals and types of attack that each protocol can prohibit in the network. The result presents a common attacks in WSN resisted by some chosen protocols. This research considered a base for other researchers in Wireless Sensor Network and Internet of Things field.

Keywords—Authentication; Attacks; IoT; Protocols; WSN

A Cost Effective Information Display System Based on Open Source Technologies

Feras Al-Hawari, Hadi Etaiwi, Sahel Alouneh

Abstract— The design and development of an information display system are discussed in this paper. This system is used to display dynamic content (e.g., announcements, news, slideshows, and other information) on HD TV screens that are distributed across the university campus. The low cost and small size raspberry pi devices running a Linux-based OS are utilized to open a dynamic web page in web browsers and then transfer the views to the corresponding screens for display. To cut costs further, the management software to update the displayed content is developed in-house and deployed using free open source software technologies such as the Apache server, PHP engine, and MySQL database management system. Furthermore, users may interactively scan a QR code on a screen using a reader running on their smartphones to easily access the offered services.

Keywords— Information display system; screens; raspberry pi; open source software; content management; web applications; Apache; PHP; MySQL; QR code

Innovation in Education via Problem Based Learning from Complexity to Simplicity

Mohammed Saleh Sonia Baker Nedaa Al Barghuthi

Abstract— We are living in era characterized by the rapid development of Technology and The fourth industrial revolution that will alter the way we live and learn. Computer Teaching Labs based on Virtualization and Augmented reality are becoming more important in education because they provide cost effective learning and experimenting environment for students and faculty that facilitates real work scenario experience necessarily needed for PBL. Problem-Based Learning (PBL) is conquering academia and increasingly attracting universities around the globe. PBL is one of the novel developments in University education that enhances millennial students' academic content learning and cognitive and communication skills. Since it was introduced it presented a significant change in educational approach that required considerable effort and commitment by lecturers and students, but offered major benefits in return to the students, universities and industry. While some universities are weighing on PBL other put it more succinctly, implementing PBL in their engineering courses. Considering its demand and benefits to the 21st century UNESCO established a Chair in Problem Based Learning, the overall objective of this UNESCO Chair is to create a global society for researchers and academic staff working with PBL in PBL projects; that require real practice and real issues; are mainly sourced from industry and reflects positively on the students as it will give them opportunity to interact and team work in lookalike job environment and scenarios. This research objective is to investigate its significance and demand. It examines the PBL effects on performance of engineering graduates as perceived by employers while providing an overview and high-level background on introduction of PBL for Engineering Students in particular and how it benefits the students in gaining work environment experiences while still studying in the university.

Keywords— PBL; communication skills; education; learning outcomes; pedagogical effectiveness; plagiarism

Smart Water Distribution Management System Architecture Based on Internet of Things and Cloud Computing

Sawsan Alshattnawi

Abstract—The fast population growth demands to provide clean and affordable water that meet the human requirements. The water faces a problem in the future because of global climate change. An efficient water management and treatment is necessary to keep water quality and availability. Information and Communications Technologies (ICT) is combined with the Internet of thing (IoT) to facilitate water management and provide efficient operation of water resources, water distribution, and water quality. This paper presents an architecture for Smart Water Distribution System (SWDS) that incorporate the IoT and Cloud Computing technologies with ICT, no practical step is taken towards any phase in this paper, it contains all the theoretical requirements necessary to implement such system, especially in third world countries where the water supply is intermittent. A survey of ICT-based water distribution management is provided and an overview of the most promising technologies related to them are thus explained.

On Utilizing the Pursuit Paradigm to Enhance the Deadlock-Preventing Object Migration Automaton

Abdolreza Shirvani and John Oommen

Abstract—One of the most common problems encountered in computing is that of “partitioning”, and probably the most reputed solution for partitioning is the Object Migration Automata (OMA). The OMA has proven applications in databases, attribute partitioning, processor-based assignment etc. However, one of the known deficiencies of the OMA is an internal deadlock scenario which is discussed in this paper. This occurs when the problem size is large, i.e., the number of objects and partitions are large, and when the probability of receiving a reward (i.e., one that “strengthens” the current partitioning), from the Environment is not significant. As a result of this, it can take the OMA a considerable number of iterations to recover from an inferior configuration. This property, that characterizes Learning Automaton (LA) in general, is especially true for the OMA-based methods. In spite of the fact that various solutions have been proposed to remedy this issue for general families of LA, overcoming this hurdle is a completely unexplored area of research for conceptualizing how the OMA should interact with the Environment. Indeed, the best reported version of the OMA, the Enhanced OMA (EOMA), has been proposed to mitigate the consequent deadlock scenario. In this paper, we demonstrate that the incorporation of the intrinsic properties of the Environment into the OMA’s design leads to a higher learning capacity, and to a more consistent partitioning. To achieve this, we incorporate the state-of-the-art pursuit principle utilized in the field of LA by estimating the Environment’s reward/penalty probabilities, and use them to further augment the EOMA. We also verify the performance of our proposed method, referred to as the Pursuit EOMA (PEOMA), through simulation, and demonstrate a significant increase in the convergence rate, i.e., sometimes by a factor of as large as forty. It also yields a noticeable reduction in sensitivity to the noise in the Environment.

Keywords— Object Partitioning, Learning Automata, Object Migration Automaton, Partitioning-based Learning

Context Aware VR Using BLE Beacons

Ahmad Jarrar, Edward Jaser

Abstract—This paper studies the possibility of bringing context awareness to Virtual Reality applications running on an Android smartphone. By leveraging the tools provided by the Android system to scan and analyze the surrounding environment for Bluetooth Low Energy beacons. The data obtained from the beacons is then broadcasted through the Android system to other applications and Virtual Reality games running on the same Android device. Beacons data contain information about the signal received from each beacon. This data is used to estimate the distance between the beacon and the smartphone. The estimated distance can be used in Virtual Reality applications to change the location of object. The paper proposes a method that achieves the required task from the moment a beacon is detected until the data is passed and used inside the Virtual Reality application. The evaluation of the proposed system is mainly based on the resulted latency, accuracy of the estimated distance and CPU usage. The result shows the latency can be controlled and minimized to ensure smooth Virtual Reality experience.

Keywords—Android; BLE beacon; Virtual Reality; context awareness; Eddystone

Toward a Model for E-Learning Recommender System Adoption: A Pilot Study

Hadeel Alharbi and Kamaljeet Sandhu

Abstract— Over the past decade universities all over the world have realized the value of providing educational information and services electronically. With this growing interest in elearning, the question of how to increase learner's adoption and usage of e-learning services including recommender systems has been raised. In order to facilitate students' adoption and use the e-learning service channel, educational institutions and e-learning researchers need to understand factors that influence students' adoption and usage of elearning recommender systems. Grounded in the Technology Acceptance Model (TAM) framework, this paper develops a unique conceptual model by integrating the TAM with a set of new factors identified in the literature: user experience and service quality. The revised TAM model developed in this paper is to study, at a later stage, the impact of these factors on students' adoption of e-learning recommender systems in developing countries. As part of a larger research project, this paper reports the survey instrument development and validation in the field. We administered a survey instrument to a sample of 75 students randomly chosen from university students in Saudi Arabia. Although the sample was small, it indicates that the reliability of the scales is within an acceptable range and it can be used to test the main study hypotheses.

Keywords— E-learning adoption, recommender system, Technology Acceptance Model (TAM), user experience, service quality

Dynamic Evolution of Hashtags on Twitter: A Case Study from Career Opportunities Groups

Layal Abu Daher, Rached Zantout and Islam Elkabani

Abstract— Online Social Networks (OSNs) are defined as a network of relationships where human entities represent the nodes and the edges between these nodes represent the relationships leading to online communities. Due to the rapid growth of social media networks and the consequent growth of communities on such networks, it was of great interest for researchers to study the evolution of such communities to know how they retain their members, attract new ones and grow over time. This paper focuses on the factors causing people to participate on certain communities on Twitter, which in turn affects the evolution of these communities. In order to study this evolution, we collected a dataset of some Twitter hashtags related to career opportunities between the period of February and March 2016. The collected dataset allowed us to study the reciprocal effect of the users' topological features and their activity levels. This study helped us to spot the measures that can be used for influencing a user to attract other users to a certain hashtag. In addition, it concentrated on the centrality and the activity level of participants and their effect on the activity level or the membership of other users on same communities.

Keywords— Evolution; Features; Influence

Web-Based Augmented Reality with Natural Feature Tracking and Advanced Rendering

Mohammed Al-Zoube

Abstract— Despite the existence of many well-designed augmented reality (AR) applications, most of these apps target specific hardware and platform, and few of them render virtual objects which are coherent with the real world. This paper presents an AR application with rendering effects that would increase the consistency between virtual and real world. The application adopts web-based technologies which enables it to run on different machines (mobile, PC) and platforms (windows, android, iOS) without modifications. The virtual objects are rendered with techniques such as cube mapping, and GLSL shaders to model various materials without the need for special setup or extra offline computations. Furthermore, the application uses natural feature tracking for image registration which makes it applicable for both indoor and outdoor scenarios. The results show that the application runs at real-time rates on PC browsers with significant improvement in the visual coherence of the final rendered scene, and at interactive rates on the mobile device.

Keywords— Augmented reality; cross-platform; web apps; natural feature tracking; advanced rendering

Fast Block Matching Criterion for Real-Time Video Communication

Nijad Al-Najdawi

Abstract— Recently several hardware and software solutions have been provided to transmit videos over low bit-rate channels. Although video decoders are simple and can be easily implemented; however, high quality video encoders for real-time applications are still considered an open area of research for most of the compression algorithms available in the field. In video encoders, full-search motion estimation algorithms results in global optima at the cost of intensive computations that restricts its use in real-time applications. With a trade-off between quality and complexity, various algorithms have been proposed in literature for fast search motion estimation, with the majority of them developed in the spatial domain. For this purpose, researchers have proposed many approaches that perform matching of pixels in consequent video frames using different searching methods. Although those algorithms reduce the total number of required mathematical operations per block when compared to Full Search, the results converge to local minima, and a significant amount of computations is still required. Therefore, in this research, a real-time video compression system has been developed to provide a solution to this problem, and make real-time multimedia applications such as video conferencing affordable. In particular, this paper proposes a motion estimation algorithm in the frequency domain, where the new block matching method examines the similarities between a subset of frequencies in corresponding blocks. This approach significantly reduces both the number of comparisons and the total mathematical computations required per block.

Victim blaming in abuses on the Internet

Istvan Laszlo Gal, Zoltan Nagy

Abstract—The interest in research in criminology science has necessarily turned to the analysis of victim blaming, As we can say the victimology, which is independent science the study of victims of crimes. Victimology goes beyond the criminological, criminal-law aspects, the victim's concern, and the pre-criminal situations are the subject of research. The immanent part of victim research is typing victim offenses. Because of the short constraints, according to Stephen Shafer typical a precipitative victim whose behavior, neglect, seduction can easily to help to commit a criminal offense. Let's see three abuses that the careless users can help to commit the offense. The essence of war driving might be its name: stealing, unlawfully using of a protected Wi-Fi. If the user does not protect or disable the WiFi security system, owner can pay more for using beyond the subscription. Phishing means data obtaining from user fraudulently by e-mail, mobile phones and other way. The unwary users are releasing their data, and then being used for offenses by offenders. DoS or DDos attack requires infected computers. The more computers connected (infected) the more successful the attack. Infected botnet virus is installed by users on their own computers, easily downloading an unknown program, opening suspicious files or by clicking on uncertain sites. Users should also be prepared for safe Internet use. Each protection system as secure as the weakest protection of users.

Using Tree-Structured Wavelet Transform to Classify and Retrieve Texture Images

Hebatallah Khattab

Abstract—Digital Image Processing (DIP), which concerns with the transformation of an image into a digital format and handles it by digital computers, is an important process in various domains that rely on using digital images to perform their operations. Image classification is one of the major tasks achieved by DIP where an image is categorized based on its digital content. The Tree-Structured Wavelet Transforms is a one technique that is commonly applied to perform textural image classification. This paper demonstrates how the Tree Structured Wavelet Transforms (TSWT) approach works. Also, TSWT approach is implemented and employed to perform the task of textural image classification. In addition, the implemented approach is evaluated practically to validate its classification capabilities by using two different data sets. These data sets are Brodatz data set for different rotated textures images, and distorted fingerprints data set for different persons. The results illustrated that the TSWT can work more effectively by higher classification rate on the rotated images of Brodatz images. But it cannot deal efficiently with the distorted ones of the fingerprints images.

Keywords—Image classification and retrieving; textures images; Tree-Structured Wavelet Transform
