Research Newsletter

College of Computer & Information Sciences

Vol 1. No. 2 January 2010
http://info.psu.edu.sa/psu/cis/research

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Newsletter Editors

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Foreword

The mission of the College of Computer and Information Sciences consists of three important elements: teaching, research and serving the community. Students are prepared for professional practice, graduate study, lifelong learning, and for leadership roles in society. Faculty members develop the scientific and technological base for the computing profession, and disseminate advanced technical knowledge. A balance among the three components of the mission is sought through a partnership built among students, faculty, staff, alumni and industry. As per our mission, research represents a very important pillar for our college.

This second issue of the *College Research Newsletter* for the academic year 2009-2010 provides up-to-date information about the research and other scholarly activities undertaken by the college faculty members. This Research Newsletter, published by the research committee of the college on a bi-annual basis, provides an overview of our faculty's research output, as well as the different research activities done by our faculty during the last year. In particular, the Research Newsletter reports on faculty publications, conference presentations, projects, and many other features.

The CIS college is making its best efforts in promoting the new research activities and grants through the PSRTC and KACST so that the faculty members can actively participate in the research which is not only beneficial to their own professional career but also to the development of the society at large. Our sincere appreciation is due to the research committee, in particular Dr. Mohamed Tounsi and Mr. Basit Qureshi for compiling this edition of the Research Newsletter.

Dr. Abdulaziz Al-Sehibani
Acting Dean of Computer and Information Sciences

Editorial

The College of Computer and Information Sciences endeavors to improve research and teaching on its way to the forefront, slowly but carefully expanding capacity, growing in national prominence, and continuing to develop new knowledge. Being an integral part of the first privately funded university in the Kingdom of Saudi Arabia, Prince Sultan University, the College prides itself in improving the amount of quality research done at national and international level with the help of selfless leadership and a constantly hard-working faculty team. In essence to showcase the research work done at the college, a newsletter is published bi-annually by the College of Computer and Information Sciences.

The purpose of this newsletter is to convey to our colleagues in academia the highlights of our success in research during the present academic year. As with excellent research done by esteemed faculty members in the college, a number of publications were made both at national and international level representing Prince Sultan University in quality conferences and journals. During the academic year 2008/9 a total of 26 research papers were published from CCIS faculty members including 18 journal, 7 conference articles and one book chapter. To date, during the present academic year 2009/2010, a total of 26 articles have already been published including 10 journal, 15 conference articles and one book chapter.

The first Colloquium was organized by CCIS on April 13, 2009. The purpose of this meeting was to present the achievements of many staff members who have been actively involved in publishing, presenting, or submitting research work. The effort was appreciated at various levels and a further such meeting was planned for the next academic year. The second colloquium was held on January 18, 2010 with the inclusion of five research talks. For the first time an invited guest from King Saud University, Prof. Ahmet Aksoy presented his research work to PSU audience.

We would like to welcome three new faculty members joining CCIS recently. Joining the team are Dr. Rachid Zantout, Dr. Sulieman Bani Bakr and Dr. Ahmed Sameh; with their experience and outstanding achievements in quality research in international community would most certainly boost the research image of the University.

Editors: Basit Qureshi & Dr. Mohamed Tounsi ---

Research at CCIS

The College of Computer and Information Sciences has established four research groups covering the research areas of faculty members. Each group has a few members with a coordinator to coordinate research efforts in that group.

Artificial Intelligence: Artificial Intelligence research group performs research in the areas of Image Processing, Computer Human Interaction (CHI), Problem Solving Algorithms, Intelligent Systems, Machine Learning and Neural Networks.

Computer Networks: The Computer Networks group performs research in broad areas of Network Technologies such as Wireless Networks, Performance in Networks, Data Security and encryption, Network Security, Network Protocols, Mobile Technologies, Wireless Sensor Networks, Signal processing and Secure Data communication.

Databases & Software Engineering: The Databases & Software Engineering Research group performs research in the areas of Programming Languages, Ethics in Software Development, Project Management, Agile Development, Distributed Systems, Software Reliability, Software Testing, Data Mining, Data warehousing, Web Mining, Grid Computing and Distributed Databases. The research group also performs research in related fields such as Computer Graphics.

Management Information systems: The MIS research group organizes around the area of Management Information systems and performs research in areas such as Enterprise Resource Planning, Information systems, Business Processing, Business Process Re-Engineering / Modeling, IT services, E-Business and M-Business.

Research Projects

The following lists the abstract of the research projects submitted to Prince Salman Research and Translation Center during the academic year 2008-2010.

1

M. Tounsi, K. Abudiyah, f. Khellah, A. Menan,
Project submitted to King Abdulaziz City of Science and Technology (KACST)
Self Organizing Maps Based Algorithms: An application for Medical Warehouse

Abstract

Nowadays, most of the hospitals save medical records and medical data into database server. As most of the medical records have been computerized using information technologies. These data is not used effectively for analysis and knowledge discovery due to the variety of these data: image, text, video...Etc. The purpose of this project is to define a set of algorithms based on self organizing map (SOM) to mine the data. The first part of the project would be to define and design SOM algorithms for medical databases and the second part will be to use such algorithms on medical databases to extract information and new patterns. The project may focus on the application of selected data mining technologies in medical research. More precisely the subject concerns an advanced use of developed algorithms based on Self Organizing Map that may be used with a medical database in order to learn from such data. The results of learning may be used for diagnosing new patients (classification in terms of data mining), and/or detecting unknown possible interactions between components of a treatment (medications that may mutually increase/decrease their effects), and/or finding categories of patients (through clustering) and extracting their profile in order to assist doctors to prescribe the likely most efficient treatment according to patient's profile, and/or looking for correlations between life habits (smoking, physical activity, diets, etc), prescribed treatments and the illness dynamics, etc. Most work will involve the in-depth study and application of various Data Mining algorithms based on SOM, collecting and understanding the medical data and the problems that can be tackled in this context, and making an advanced use of the new developed algorithms. This project will be divided in two main phases: development of new algorithms based on SOM, and later an application of all the phases of a knowledge data discovery (KDD) process model on medical databases (specification of the problem and collection of data, data pre-processing, data mining, interpretation and evaluation, deployment).

2

M. Tounsi
Project # IBRP-CS-2008-3-31
Particle Swarm Optimization: A Theorical Foundations and Experiments for Combinatorial Optimization Problems

Abstract
Particle Swarm Optimization (PSO) is a new proposed approach proposed by James Kennedy and R. C. Eberhart in 1995. It's inspired by social behavior of bird flocking or fish schooling. The PSO is meta-heuristic tend to solve optimization problems in the same philosophy as the Genetic Algorithms. PSO algorithm is considered as a tool for optimization and representing framework for artificial agents. The particles based methods provide population-based search techniques in which individuals called particles change their position (state) with time. In a PSO system, particles fly around in a multidimensional search space. During flight, each particle adjusts its position according to its own experience, and according to the experience of a neighboring particle, making use of the best position encountered by itself and its neighbor. Thus, as in modern genetic algorithm and mimetic algorithms, a PSO system combines local search methods and global search techniques. The purpose of our research is to demonstrate that particle swarm optimization can be applied for a large range of NP-Complete problems such as the Vertex Covering Problems, Timetabling Problem, Assignment Problems and in general resource allocation problems. Combining the particle swarm approaches with other successful algorithms and heuristics may give a best running times for a real life problems. The current research will be divided in two parts:
1. Theoretical foundations of swarm optimization: Study the convergence of the algorithms, finding the best values for the PSO parameters and proof the soundness of the swarm-based algorithms
2. Real Life Problems and Benchmarks Experiments: Apply new swam-based algorithms on real benchmarks for resource allocation problems and other NP-Complete problems.

3

M. Tounsi
Project # IBRP-CS-2008-5-3
Local Search Framework to Solve Optimization Problem

Abstract

This work introduces a framework for local search algorithm formalization. Local search is an optimization paradigm that has recently gained interest as a method to improve search strategies for combinatorial optimization problems. We will propose a General Local Search Framework (GLSF), an object-oriented framework to be used as a general tool for the development of local search algorithms. The different components of the framework define the parts of the desired algorithm. We will provide the most used local search algorithms in generic forms and therefore we present a more general approach to build and construct a local search algorithm based on generic parameters. The proposed framework supports also the design of new search algorithms. Better representation and results when using the proposed framework with adaptive functions. This general model will enable us to obtain valid and correct solution for different optimization problems. The current research will be divided in two main parts:
1. Theoretical foundations of local search algorithms: Study of the local search algorithms and define the local search algorithms components which are the common for all local search algorithms and then provide a general schema for using such algorithms in any optimization problem.
2. Implementation of a local search framework to solve optimization problems: Apply new swam-based algorithms on real benchmarks for resource allocation problems and other NP-Complete problems.

Colloquium Series

To promote research in the CCIS College, the research committee, bi-annually organizes a Research Colloquium. Each research group in CCIS present their research projects/research directions and some interesting topics in recent research areas. The Research Colloquium helps in promoting research, scholarship and creative work among faculty members that is a vital component of providing quality education at any university. Faculty members from all colleges in the university are encouraged to participate. Industry sponsors will be also invited to attend when possible. The primary goal of the Research Colloquium is to bring together faculty involved in scholarly and research activities representing all the research topics of the computer and information sciences.

The first colloquium was held on 13 April 2009. A brief report about research activities was presented to Dr. Fida, Vice-Rector of academic affairs at Prince Sultan University followed by detailed report on group members and research activities in all groups. Each of the four research groups in CCIS also presented at least one research paper recently published / accepted for publication with the number of talks totaling six. The talks were given by Prof. Eltayeb Abuelyaman, Dr. Mohamed Tounsi, Dr. Hussein Karam, Mr. Basit Qureshi, Dr. Patrick Halloran and Dr. Nourredine Sofiane in various areas of computer science. Further information about 1st colloquium can be found on CCIS Research website http://info.psu.edu.sa/psu/cis/research.

2nd Colloquium

The second Colloquium in the bi annual series of colloquium is to be held on 18th of January 2010. A brief report about research activities in CCIS during 2008 / 2009 academic year was presented to Dr. A. Fida, Vice-Rector of academic affairs at Prince Sultan University. In this colloquium five research talks were presented based on research papers recently accepted / published in conferences. Participants in this colloquium included Prof. Mehmet Aksoy, Prof. M.A. El Affendi,

Prof. Suleiman Beni Bakr, Dr. Rachid Zantout and Dr. Patrick Halloran. Prof M. Aksoy was an invited guest speaker from College of Computer and Information Sciences, King Saud University, Riyadh. Three of the five talks were focused on research in the area of Natural Language Processing (NLP) for Arabic Language.

2nd CCIS Colloquium (January 18, 2010) Program			
Time	**Activity**	**Speaker**	**Areas of Focus / Title of Talk**
Welcome Presentations (1:00 – 1:15 pm)			
01:00 pm	Welcome	Dr. Abdul Hafeez Feda V. Rector PSU	Welcome message
01:05 pm	Dean Welcome	Dr. Abdul Aziz Al Sehebani Dean CCIS	Welcome message & Research in CCIS
01:10 pm	Colloquium Chair	Dr. Mohamed Tounsi Dept of CS	CCIS Research Activities during 2008-2009
Research Presentations (1:15 – 3:30 pm)			
01:15 pm	Invited speaker	Prof. Mehmet Aksoy CCIS, King Saud University	RULES family of Induction Algorithms and their applications
01:45 pm	Research Paper	Dr. Patrick Halloran Dept of IS	A Preliminary Study of the Maturity of Project Management & Software Development practices in KSA
02:10 pm	Research Paper	Prof. Suleiman Bani Bakr Chair dept of IS	The Arabic Keyboard Layout: Performance and ways for improvement
02:35 pm	Research Paper	Prof. Mohamed El Affendi Chair dept of CS	A Top Down Message Driven Parsing Engine For Natural Language Processing
03:00 pm	Research Paper	Dr. Rashid Zantout Dept of IS	Statistical Natural Language Processing for Arabic Language
03:25 pm	Closing		
Prayer & Refreshments (3:30 – 3:45 pm)			
*** Each talk is of 20 minutes duration followed by Q & A session.**			

Colloquium Talk Abstracts

A. Aksoy
"RULES family of Induction Algorithms and their applications"
In recent years, there has been a growing amount of research on inductive learning. Out of this research a number of promising algorithms have surfaced. In this talk after a brief description of knowledge acquisition, induction and inductive learning; RULES family of inductive learning algorithms, their strengths as well as weaknesses will be explained and discussed. The applications of inductive learning and particularly the applications of RULES family of algorithms will be overviewed

M.A. El Affendi
"A Top Down Message Driven Parsing Engine For Natural Language Processing"
This talk describes a top-down parallel parsing engine that has been derived in the context of an experiment on adaptive natural language processing systems. The main idea was to design a parsing engine that copes with dynamic variations in the underlying grammar, avoids backtracking and escapes the overhead of computing complex parse tables. The designed engine satisfies all these requirements. It is independent of the actual form of the input grammar; avoids backtracking by generating all alternatives in parallel and does not require a parse table. The only required table is an internal representation of the input grammar, which may be dynamically modified or replaced without the need to modify the algorithm. Another important feature is that designed is message oriented and conforms well to the recent principles of service oriented architectures (SOA).

R. Zantout
"Statistical Natural Language Processing for Arabic"
In this talk Dr. Zantout will be presenting his current research in Arabic Statistical Natural Processing. He has studied the statistical properties of Quranic Arabic and computed information about the occurrence of letters and words as well as their N-Grams. He also developed some guidelines that will help in ameliorating autonomous alignment of parallel text. In this talk, Dr. Zantout will also touch upon some future plans and a rough sketch for a roadmap for developing Arabic Statistical Natural Language processing tools.

S. Bani Bakr
"The Arabic Keyboard Layout: Performance and ways for improvement"

One of the most important HCI systems is the keyboard. The keyboard layout is the way by which letters are mapped and arranged on the keyboard. The current keyboard layout was inherited from first Arabic typewriter layout. The objective of this study was to answer the following questions: How good is the current Arabic keyboard layout? Can we improve the current Arabic layout? A new keyboard layout has been designed based on frequency probabilities in terms of single letter frequencies, bi-gram frequencies, and most frequent words using a corpus of about 8.7 million Arabic words. The current and proposed layouts were compared using the following parameters: fingers travel ratio, hands and fingers balance, successive finger movement, distribution across rows, and typing most frequent words. The results indicate that the current keyboard layout suffers from various drawbacks. The proposed keyboard layout showed superior performance in respect to the parameters given above.

P. J. Halloran

"A Preliminary Study of the Maturity of Project Management & Software Development practices in KSA"

This research is a pilot study of the state of Project Management and Software Development in Saudi Arabia's Information and Communication Technology (ICT) industry. As ICT traditionally forms a significant part of most business activities, this has significant implications for the Saudi economy, not only in terms of competiveness and GDP etc but in understanding the requirements for human capital skills in the sector (including our ICT graduates). Although some research suggests that (ICT) is starting to make significant gains in the Saudi economy in recent years; this research suggests that there are concerns in the software development sector, that the adoption of "best practice" is not as successful as anticipated. This presentation will provide a brief snapshot of the nature and extent of Project Management and Software Development best practice in ICT companies; and secondly, explore the human capital dimension including type of companies, competencies of key workers, and the cultural diversity of these ICT firms.

List of publications (last updated January 18, 2010)

	2010
J	**Mohamed Tounsi, "** TTGENERATOR: An Intelligent Solver for Timetabling System", Applied Soft Computing Journal, Elsevier, to appear in June 2010
J	**Hussein Karam**, "A new plot/character-based interactive system for story-based Virtual reality applications", International Journal of Image and Graphics, World Scientific Publishing Company, To appear in Jan., 2010.
J	**Mohamed Tounsi,** "An intelligent Based System for Bank Ranking and Assessment", International Journal of Electronic Finance. To appear in March 2010.
J	**Mohamed Tounsi,** "Swarm Intelligence Algorithms for Vertex Covering Problem" International Journal of Soft Computing, Elsevier, To appear in April 2010.
J	**Halloran. P.J.,** Book Review. Building Knowledge Economies: Advanced Strategies for Development, World Bank Institute (WBI) Development Studies. Saudi Computer Journal. Applied Computing & Informatics. Vol 8:1 2010. Pp 78-80
C	**Basit Qureshi**, Geyong Min and Demetres Kouvatsos, "Establishing Trust in P2P MSN with Greedy DA-GRS based algorithms", to appear in the 30th International Conference on Distributed Computing Systems (ICDCS 2010), Genoa, Italy, June 21-25 2010
C	**B Qureshi**, M Ilyas, G Min and D. Kouvatsos, "Adaptive Opportunistic Routing protocol for disconnected MANETs", to appear in AINA 2010 workshops, Perth, Australia, April 2010.
	2009
J	**M.A. El Affendi**, "A Two-Level Digital Watermarking Solution to the Ambiguity Problem in Arabic Names Romanization", Accepted for publication in the ACI Journal, 2008.
J	**M.A. El Affendi**, "Injected Surface-Lexical Mappings and Memory Bitmaps: A Simple Solution for the Irregularity Problem in the SWAM Part-of-Speech Morphological Tagger", Accepted for publication in the ACI Journal, 2008
J	**A. Alsehibani** "Prime VS Power of two based S-Box Implementations" To Appear in the Saudi Computer Journal , 2009
J	M. Salameh, **R. Zantout**, N. Mansour, "Improving the Accuracy of English-Arabic Statistical Sentence Alignment", Accepted for Publication, International Arab Journal of Information Technology (IAJIT), 2009.
J	**H. Karam** "Bcreative: A New Platform for Plot/Character-based Interactive Storytelling Technology", Saudi Computer Journal (Accepted To Appear), March 03, 2009
B	A. Yaqzan, I. Damaj, **R. Zantout**, Reconfigurable Hardware Implementation of a GPS-Based Vehicle Tracking System, in Advances in Electrical Engineering and Computational Science, Sio-Iong Ao and Len Gelman (Editors), Springer Netherlands, April 2009. V 39 P 289 – 299
C	**Halloran. P.J.**, "Quality in Teaching Evaluation". International Conference on 'Teaching and Learning as Tools of Progress in Higher Education. Prince Sultan University. Riyadh Saudi Arabia Oct 2009
C	**Halloran. P.J.,** An Evaluation of Teaching: Observations across three Cultures. ITI 2009 Conference in Cavtat/Dubrovnik Croatia. 22nd – 25th June 2009;
C	**Halloran. P.J.** "The Challenge of Teaching Evaluations: The Maturity of Learning Organisations". Edulearn Conference Barcelona, Spain. 6th – 8th July 2009
C	**R. Zantout**, M. Jrab, L. Hamandi, F. Sibai, "Fleet Management Automation Using the Global Positioning System", 6th International conference on Innovations in Information Technology (Innovations 09), Al Ain, United Arab Emirates, December 15-17, 2009
C	N. Mirza, Z. Osman, **R. Zantout,** M. El-Sayed, "Error Correction of noisy block cipher using cryptanalysis and natural language processing," Third International Conference on Network and System Security, Gold Coast, Australia, 19-21 October 2009.
C	N. Mirza, Z. Osman, **R. Zantout,** M. El-Sayed, "Correcting Noise in Block Ciphers," First International Conference on Computational Intelligence, Communication Systems and Networks, Indore, India, 23-25 July 2009.

C	N. Mirza, Z. Osman, **R. Zantout**, "A Novel Approach for Correcting Noisy AES Ciphers," 2009 International Conference on Information Security and Privacy (ISP-09), Orlando, FL, July 13-16.
C	N. Mirza, Z. Osman, **R. Zantout**, "Correcting Noisy Ciphers in CBC mode," 2009 International Conference on Information and Network Technology (ICINT 2009), 10-12 July 2009, Perth, Australia.
C	Z. Osman, L. Hamandi, **R. Zantout**, F. Sibai, "Arabic Optical Character Recognition", The 10th Annual UAE University Research Conference, United Arab Emirates University, Al-Ain, 13-16 April 2009.
C	**K. Almustafa** and S. Primak, "Optimization of Pilot Placement in Adaptive M-PSK Modulation in Rayleigh Fading Channel in Imperfect CSI," Proceeding IEEE-GCC09. Kuwait City, March 2009
C	**B. Qureshi,** G. Min, D. Kouvatsos, "A Content-driven data propagation protocol for Mobile Social Network in disconnected MANETs", Proc. of International Conf. on Wireless Information Networks and Systems (WINSYS09), italy, July 2009
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C	**A. Alsehibani** and **E. Abuelyaman** "Encoding as an extra layer of Security" Second National Information Technology Symposium, Riyadh, SA, March 2009
	2008
J	**M Tounsi, B Qureshi,** "A Bluetooth intelligent e-healthcare system: analysis and design issues", International Journal of Mobile Communications, Inderscience publishers, Vol. 6, Nos. 6, pp. 683-695, Nov/Dec, 2008.
J	S. Ouis, **Mohamed Tounsi "**An explanation-based tools for debugging constraint satisfaction problems". Applied. Soft Computing Journal. 8(4), Elsevier, 1400-1406 (2008)
C	**M.Tounsi** "Intelligent System for Bank Assessment: A Preliminary Results" The Saudi 19th National Computer Conference (NCC19), November 2008.
J	**E.S. Abuelyman** & **A.S. Alsehibani**, An Optimized Implementation of the S-Box using Residues of Prime Numbers, , IJCSNS International Journal of Computer Science and Network 304 Security, Vol. 8 No. 4, 2008
J	**E.S. Abuelyman**, Hardening of Pin Numbers of Automated Teller Machines, IJCSNS International Journal of Computer Science and Network Security, Vol. 8 No. 2, p. 283, 2008
C	**Hassan I. Abdalla**, **Mohamed Tounsi**, Farhi Marir "Using a Greedy-Based Approach for Solving Data Allocation Problem in a Distributed Environment". PDPTA 2008: 975-980, USA, June 2008
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J	**H. Karam,** Robust Interactive Storytelling Framework for Automatic TV ContentStory production, Lecture Notes in Computer Science, Springer, LNCS 5309, pp. 134-148, 2008
J	S. Subramoniam, **S.K. Ghani** and K.V. Krishnankutty, A Fuzzy Logic Approach to Modeling Uncertainty in Static Inventory Problems , under Risk, , Saudi Computer Journal, Vol. 6, Issue 2, 2008
J	**M. Tounsi**, An Overview of ILOG Optimization Suite, Journal of Applied Computer Informatics, Vol. 6 (2), 2008
J	**M. Tounsi,** Towards a General Model for Local Search Technique, Journal of Applied Computer Informatics, Vol. 7, No. 1, 2008
J	**M. Tounsi** and S. Ouis "A Minimal Nogood Computation for Optimization Problems, International Journal of Artificial Intelligence and Soft Computing, Vol.1, No. 1, 2008
J	**M. Tounsi,** S. Subramoniam and K.V. Krishnankutty, The Role of BPR in the Implementation of ERP Systems, International Journal of Business Process Management, 2008
J	**M. Tounsi,** S. Subramoniam and K.V. Krishnankutty, The Development of an Intelligent Agent Prototype for Mutual Fund Investment, International Journal of Electronic Finance, Vol. 2, No. 3, pp.300–313, 2008
J	**M. Tounsi** and S. Ouis, An Iterative Local-Search Framework for Solving Constraint Satisfaction Problem, International Journal of Applied Soft Computing, Vol.8, No. 4, pp. 1530-1535, 2008
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B	**Halloran. P.J.** Book Chapter: An Infrastructure for Process Improvement. Organisational Learning and Knowledge Management in Knowledge Management: Theoretical Foundations. Editors Koohang. A. & Harman. K.. Santa Rosa, California: Informing Science Press. 2008
C	**H. Ismail, M. Tounsi** and F. Marir, Using a Greedy-Based Approach for Solving Data Allocation Problem in a Distributed Environment, , Proceedings of International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'08), July 14-17, Las Vegas, USA, 2008
C	**Mohamed Tounsi**: An intelligent Bank Assessment System: A Preliminary Study, in 19h National Conference on Computing, November 2008. Riyadh, KSA
C	**H. Karam,** Robust Interactive Video Game Platform from Design to Production, IEEE International Conference Visualization, London, July 9-11, 2008
C	**H. Karam,** An Intelligent Tutoring System for Improving Application Accessibility of Disabled Learners, , 5th International Conference on Computer Graphics, Imaging and Visualization, 2008

C	**H. Karam,** A New Framework for Plot-based Interactive Storytelling Generation, , 5th International Conference on Computer Graphics, Imaging and Visualization, 2008
C	**Halloran, P.**, SPI in a Small Organisation: The Paradox of Cultures and Organisational Learning. SME – Entrepreneurship Global Conference, Melbourne Australia. 3-4th July 2008;
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Mobile Cloud Computing

Feature Article by Basit Qureshi

The term "cloud computing" is being bandied about a lot these days, mainly in the context of the "future of the web." Cloud computing is Internet-cloud based development and use of computer technology [1]. In concept, it is a paradigm shift whereby details are abstracted from the users who no longer need knowledge of, expertise in, or control over the technology infrastructure "in the cloud" that supports them. It typically involves the provision of dynamically scalable and often virtualized resources as a service over the Internet. Typical cloud computing providers deliver common business applications online which are accessed from a web browser, while the software and data are stored on the servers. Commonly used example of Cloud computing applications are Maps, Social networking services, file and video sharing etc.

"Mobile data to increase 14-fold by 2014, much of it in the cloud" [2]

Mobile Cloud Computing refers to an infrastructure where both the data storage and the data processing happen outside of the mobile device [3]. Today, there are already some good examples of mobile cloud computing applications including mobile Gmail, Google Maps, and some navigation apps. However, the majority of applications today still do most of the data storage and processing on the mobile devices themselves and not in the cloud. In a few years, that could change.

Not only is there a broader audience using feature phones in the world, there are also more web developers capable of building mobile web applications than there are developers for any other type of mobile device. Those factors, combined with the fact that feature phones themselves are becoming more capable with smarter built-in web browsers (and more alternative browsers available for download), will have an impact on mobile cloud computings' growth.

Saying that "mobile cloud computing" is the future doesn't mean phones will be filled with links to websites that work in any browser instead of special, downloadable applications, some of which you can even purchase. Instead, mobile applications will exist in both formats. As for the downloadable applications themselves, they will still appear to be your typical mobile application, end users won't even notice a difference. However, there *will be* a difference - it will just be on the back-end. Mobile applications will begin to store your data in the cloud as opposed to on the mobile device, and the applications will become more powerful as processing power is also offloaded to the cloud.

The first mobile apps powered by the cloud will likely be business-focused mobile productivity applications where collaboration, data sharing, multitasking, and scheduling are key factors. For consumers, though, navigation and mapping applications will be the most obvious examples of the trend. Plus, there are some specialty applications today which already function as mobile cloud apps - for example, Schlage [5] offers a remote keyless entry system which lets you remotely control your home from a distance. You can let someone into your house, manage your lights, your thermostat, your camera system, etc. There are also a few applications in the iPhone application store that let you remotely manage your PC and your DVR too.

Future Research Directions

Of course, there are some potential issues that could be barriers to this shift in mobile computing. The most notable problem is the lack of speedy mobile Internet access everywhere. Here in the US, for example, 3G coverage is spotty outside urban areas, leading to intermittent connection issues and slow speeds. Other markets may have it even worse. New technologies like HTML5, which does local caching, could help mobile cloud applications get past those sorts of issues. And there's even a chance that the browser could one day be replaced - at least in some markets - with another technology altogether which provides a better way to access the mobile web. TokTok [4], a technology that allows access to web services like Gmail and Google Calendar by voice. With voice-enabled search like this, mobile apps could talk directly to the service itself which sits on the edge of the network, as opposed to needing the user to launch a web browser and navigate through the mobile web.

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http://www.readwriteweb.com/archives/why_cloud_computing_is_the_future_of_mobile.php
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List of Upcoming Conferences

Area	Submission	Conference
Networks	4 February 2010	WINSYS, Greece, July 26-28, 2010
E Business	4 February 2010	ICE-B , Greece, July 26-28, 2010
Networks	4 February 2010	DC NET Greece, July 26-28, 2010
Networks	4 February 2010	OPTICS Greece, July 26-28, 2010
Security	4 February 2010	SECRYPT Greece, July 26-28, 2010
Multimedia	4 February 2010	SIGMAP Greece, July 26-28, 2010
Networks	8 February 2010	IEEE CIT, UK, June 1-4, 2010
Networks	8 February 2010	IEEE ICESS, UK, June 1-4, 2010
Networks	8 February 2010	IEEE ScalCom, UK, June 1-4, 2010
Software Engg	12 February 2010	SEDE, CA, USA, June 16-18, 2010
Signal Proc.	1 April 2010	IASTED SIP 2010, Hawaii, USA, August 23-25, 2010
AI	1 April 2010	IASTED CI 2010, Hawaii, USA, August 23-25, 2010
Circuits & Sys	1 April 2010	IASTED CS 2010, Hawaii, USA, August 23-25, 2010
AI	1 April 2010	IASTED HCI 2010, Hawaii, USA, August 23-25, 2010
AI &DB	2 April 2010	IEEE IDC 2010, Morocco, Sept 16-18, 2010
IT Education	1 May 2010	ICT-Learn 2010, Egypt, July 6-8, 2010

What's New at CCIS

Dr. Mohamed Tounsi is a PhD examiner!

Dr. Mohamed Tounsi was invited to be the PhD examiner to review and evaluate a research work by Anna University, Chennai. The title of the PhD is "Natural Language Grammatical Inference using Machine Learning Algorithms for Effective Language Acquisition from Transcribed Corpora". The topic of the PhD focus on machine learning algorithms, which is one of the research interests of Dr. Tounsi. An invitation to be an examiner for a PhD student is recognition of the international research works done by Dr. Tounsi. The PhD defense will be done in June 2010.

Introducing new faculty joining CCIS Research team

Dr. Rachid Zantout received his B.S. from The American University of Beirut, Lebanon in 1988, his MSc from the University of Florida in 1990 and Ph.D. from the Ohio State University in 1994, all degrees being in Electrical Engineering. Dr. Zantout is an Associate professor at the College of Computer and Information Sciences at Prince Sultan University, Riyadh, Saudi Arabia. Dr. Zantout's research interests cover Robotics, Artificial Intelligence, and Natural Language Processing. He currently works on developing components for Machine Translation and Natural Language Processing with a special focus on tools related to the Arabic Language. He also has active research in the area of autonomous robot navigation, Computer Vision, Digital Image Processing and Embedded Systems Design.

Dr. Suleiman Hussein Mustafa Bani-Bakr is a professor of Information Systems at Prince Sultan University in Saudi Arabia. He got his Ph.D. in information systems from the University of Pittsburgh (USA) in 1986. He was granted several academic awards and scholarships. After graduation, he worked at Yarmouk University (YU) for eight years and chaired the Department of Computer Science for two years. In 1994 he went on leave from YU for four years during which he worked in the Department of Computer Science at Sultan Qaboos University in Oman. He headed the Dept. of Computer Science at YU for the second time for two years (2000-2002). He was also assigned the position of Vice-Dean of the Faculty of Information Technology at Yarmouk University for one year (2005-2006) then became the Dean of the same college starting from 20/8/2006 until 13/9/2009. He joined Prince Sultan University starting from 26/9/2009 as the Chairman of the Department of Information Systems, and he is still on duty. He has published more than thirty papers in a number of research areas in computer science and information systems including natural language processing (especially for Arabic, including searching and sorting algorithms, stemming, term conflation techniques, etc), database and information retrieval systems, and software engineering. His teaching interests focus on database design and management, software engineering, object-oriented analysis and design, software project management, and information retrieval.