CSPC 2014

M^3T

Motivate Manage Move Timeliness

3MT® THREE MINUTE THESIS
FOUNDED BY THE UNIVERSITY OF QUEENSLAND

The 11th Computer Science Postgraduate Colloquium 2014

18 –19 August 2014

PULAZA, Balik Pulau

UNIVERSITI SAINS MALAYSIA
PUSAT PENGAJIAN SAINS KOMPUTER

Table of Contents

Foreword 3

About CSPC 2014 5

Event Venue 6

Keynote Speakers 7

Event's Agenda 10

What is 3MT? 12

3MT Rules & Participants List 13

Parallel Sessions 14

Abstracts Listing ::

Proposal Review 20

Research Review 21

Poster 22

Abstracts ::

Proposal Review 24

Research Review 35

Poster 36

CSPC 2014 Committee Members 50

Acknowledgement 52

Foreword from the Dean of the School of Computer Sciences

Professor Dr. Ahamad Tajudin Khader
Dean
School of Computer Sciences
Universiti Sains Malaysia

First of all, I would like to express my sincere gratitude to the committee of the Computer Science Postgraduate Colloquium 2014 for sustaining this annual meeting successfully. Throughout the years since its first opening in 2004, this meeting has been one of the best platforms for our postgraduates to share their knowledge, exchange ideas and findings of their research. This is also the best platform for them to start networking and socialize with fellow students and lecturers.

This year, the theme of Motivate, Manage, Move and Timeliness (M^3T) is chosen that hopefully will encourage and facilitate our postgraduate students with opportunities to succeed in challenging research study. They need these essential factors during the journey of a postgraduate research regardless of their stages (either in their initial research phase or in their write-up phase). Having all of these aspects ensure them to complete their research efficiently and effectively in time.

Motivation is the most important key for all postgraduate students to success. In research study, postgraduate students often find themselves in motivational slumps that require them to work hard to get out of. Choosing appropriate motivation approaches such as start simple, stay positive, just do it and keep learning are strongly encouraged. These approaches are also essential for them to manage both research and personal life. Balancing the two effectively ensure them to be happy and productive at the same time so that their research could move forward successfully. This can be achieved through a combination of constant research activities including writing, reading, publishing, presenting and many more. A solid combination of the three factors (Motivate, Manage and Move – M^3) ensures a postgraduate research student accomplishing their research successfully in time (T).

Hence, with the theme of promoting M^3T, it is hoped that this colloquium will bring benefits and equip our postgraduate students in ensuring their research's success. I wish you all the best and enjoy every moment of your journey to become a successful researcher.

Thank you.

Foreword from the Chairperson of CSPC 2014

Dr. Manmeet Mahinderjit Singh
Chairperson
Computer Science Postgraduate Colloquium 2014

Firstly, on behalf of the committee of this year CSPC 2014's I would like to extend a very warm welcome all of participants to Computer Science Postgraduate Colloquium 2014 (CSPC 2014) of the School of Computer Sciences, Universiti Sains Malaysia (USM). For over ten years now, this colloquium has been the platform for our postgraduate students to share their research's progress and findings. The theme for this year's colloquium; "Motivate, Manage, Move and Timeliness (M^3T)", is aiming to facilitate our postgraduate students with the best practices and strategies of M^3T for the quality of research.

Being a postgraduate research can be extremely rewarding and a lot of fun, but it is also hard work. Challenges come in both aspects of research and personal life. In order to achieve both aspects successfully one needs to find their strong self-motivation drives that could manage their interpersonal and research needs at the optimum level. Balancing these two ensures them to move forward successfully that can be rewarded in finishing their research in time.

A quote by LauTzu "***The journey of a thousand miles begins with a single step***". This fit the nature of research, which takes a lot of effort, hard work, and good research planning in becoming a significant research study. However, with the right practices and strategies it is possible to produce a quality research. It is hope that the CSPC 2014 program had been outlined the essential ingredients that lead to a successful postgraduate research.

I would like to take this opportunity to say thank you to the committees who had worked hard to ensure this conference a success. In conclusion, have a pleasant colloquium to all.

Thank you.

Theme

Motivate, Manage, Move and Timeliness (**M³T**)

Objectives

During the journey of a postgraduate research study, postgraduate students from all stages of their research study (those who are in their initial research phase and those in their write-up stage) face the same question: *How to ensure that they can complete their research efficiently and effectively in time?*This is the main reason for this year's theme which includes 3 values (**M**otivate, **M**anage and **M**ove) that would allow postgraduate students to complete their studies on time (**T**imeliness).

Balancing these values is an essential skill for a postgraduate student to cultivate, in ensuring a successful completion of their MsC/PhD research studies. The usual advice given to research students is to keep on writing, which is easier said than done. Motivation plays a major role for allpostgraduate research studentsand should be instilled firmly in oneself. Choosing appropriate motivation approaches such as utilizing the common expression of seeing whether the glass is half full (optimism) when facing a challenge is encouraged. Being an optimist will usually result in positive outcomes for the research student. Aside from that, it is also essential for postgraduate students to acquire the proper skills in managingboth their research and personal life. Confining oneself to a lab or desk does not ensure faster graduation for their research studies. Striking a balance between work and personal life is necessaryin ensuring that a postgraduate student is able to achieve both quality in their research as well as their future endeavors as a researcher. By motivating and managing oneself, a research student's research could move forward successfully. Such move for a research student can be achieved through a combination of constant research writing, reading and other research related activities. This involvestaking tiny steps to attain the desired outcome. Although these tiny steps may look insignificant and slow, but these steps will provide a research student with the promise of accomplishing their research successfully. A quote by Warren Buffet in 2009 highlights the importance of these tiny steps: *"I don't look to jump over 7 foot bars: I look around for 1 foot bars that I can step over"*. By inculcating these 3 values within oneself, a postgraduate research student is able to achieve success not only in their research, but also in their daily or future endeavors.

In parallel with the theme **M³T**, the objectives of CSPC 2014 are:

- To promote a research presentation culture among the current postgraduate through related activities such as the 3 Minute Thesis (3MT) competition
- To equip postgraduate students with best practices and strategies for communicating and presenting their research
- To provide a platform for research students to present their current research work
- To raise social and academic cohesion among Computer Sciences' postgraduate research students and lastly;
- To provide a common ground of interaction among postgraduate students as well as the academician in a research event.

Event Venue

The Zakat Training Centre or PULAZA was an initiative developed as part of the Zakat Centre Pulau Pinang's 10-year development plan (2003 – 2013). The Penang State Religious Council has agreed to provide some of their land in Pantai Acheh, Balik Pulau as the building site of PULAZA. Upon completion of the centre, the council allowed the Zakat Centre Pulau Pinang to manage the training centre. The training centre is quite close to the Pusat Falak Sheikh Tahir on Jalan Pantai Acheh.

PULAZA was developed with donations from the Al-Bukhary Foundation with the aim to build a training centre that provides facilities such as workshops, motivational training, seminars and more. All of these facilities are accessible at an affordable rate.

It is the hope of the Zakat Centre Pulau Pinang that all Muslims in Pulau Pinang would be proud with the development of PULAZA and, the Zakat Centre Pulau Pinang would like to offer their many thanks to the contributors of zakat as well as the customers of PULAZA.

The address of PULAZA is:

Lot Pt. 73, Mukim 1,
Jalan Pantai Acheh, 11010,
Balik Pulau, Pulau Pinang.

GPS coordinates: **5.410793, 100.196088**
Nearest Building: Pusat Falak Sheik Tahir **(5.411460, 100.196648)**

Postgraduate Research Students: Challenges and Strategies

Prof. Dr. Rosalina Abdul Salam
Faculty of Science and Technology
Universiti Sains Islam Malaysia

BriefBiography

Rosalina Abdul Salam is a professor at the Faculty of Science & Technology, Universiti Sains Islam Malaysia (USIM). She received her B.Sc. (Hons.) degree in Computing in 1992 from Leeds Metropolitan University, United Kingdom. She started her career as a System Analyst at Intel Penang in 1992. She returned to United Kingdom in 1995 to further her studies. She obtained her Masters Degree in Advanced Software Engineering from Sheffield University in 1997 and PhD in Computer Science from University of Hull in 2001. She became a lecturer at the Universiti Sains Malaysia (USM) in 2001, promoted to a senior lecturer in 2005 and to an Associate Professor in 2007. She becomes a Professor in Computer Science at Universiti Sains Islam Malaysia (USIM) in 2010. She has served as a chairperson for software engineering program at the School of Computer Sciences, USM and as a Director of Research Management Centre, USIM. Her current research interests include Artificial Intelligence, Image Processing, Pattern Recognition and Computer Surveillance Applications. She has published more than 100 papers in journals and conferences. She has supervised and co-supervised several numbers of Ph.D. dissertations and M.Sc. theses.

Keynote Abstract

Journey of post-graduate research students may vary from one to another student. However, in most cases they do encounter similar challenges in their journey. It started when they decide to enroll as a graduate student. In this talk, I will share a few challenges faced by post-graduate students in Malaysia and how we can together help each other to go through this journey successfully. Proper planning and strategies are very important. The journey is for both students and supervisors. Sharing of experiences among students and supervisors may help students to achieve their final goal.

Our Research Agenda

Prof. Dr. Ahamad Tajudin Khader
School of Computer Sciences
Universiti Sains Malaysia

Brief Biography

Ahamad Tajudin Khader is a Professor of Computer Sciences at the Universiti Sains Malaysia (USM), Penang. He is currently the dean of the School of Computers Sciences there. He received his PhD from the University of Strathclyde in Glasgow, Scotland. His B.Sc. and M. Sc. are from Ohio University. He started his academic career way back in 1984 at UKM before moving to USM in 1986. Till now he has supervised many PhD students. He also publishes extensively in reputed journals. His major research agenda has always revolved around optimization. His major interest includes timetabling, scheduling, evolutionary algorithms and lately on crowd.

Keynote Abstract

The talk will look at our current research scenario and on our future research agenda, focusing on Big Data. I will also be looking at the need to have a research culture and other pre-requisites for a vibrant and successful research environment.

3C's, 3I's & 3T's

Assoc. Prof. Dr. Krishnaswamy Jayaraman
Graduate School of Business
Universiti Sains Malaysia

Brief Biography

Dr. K. Jayaraman has 21 years of experience as a Professor in Statistics, Loyola College, Chennai, India, affiliated to the University of Madras from the years 1987-2007. He has been subsequently appointed as an Associate Professor at the Graduate School of Business (GSB), Universiti Sains Malaysia (USM) from the year 2007 onwards. He is specialized in Quantitative Research Methods and has executed major projects for national and international organizations. His areas of research include Operations Management, Service Innovation in Marketing, Quantitative Methods and Tourism & Transportation. He has published more than 60 research articles in International and National Journals. About 20% of his research articles have appeared in ISI impact factor journals. He is well accomplished by receiving the best teacher award for six consecutive years from 2001 to 2006 in Loyola College, India. He has also received the Outstanding Teacher Award 2009-2010 from USM, Malaysia. He has held many administrative positions both in India and in Malaysia, served as a Programme Manager for Communications and Marketing for two years at GSB, USM. Currently, he is guiding 13 Ph.D., research scholars of USM on various aspects of Management strategies related to Industry.

Keynote Abstract

I would like to emphasis in my talk only on 3C's, 3I's and 3T's to motivate you based on my 28 years of academic, research and consultancy experience.

As we all know that we should acquire knowledge both in terms of cognitive and practical experience. Whatever we gained, should be shared with others. The technology is so advanced and the information data base is very wide in the globe and we have to identify the correct information out of it which is a real challenge today. Our sharing experience to others should find way for them to realize the importance of the information. We should grow and prosper together with others.

Event's Agenda

DAY 1: 26 AUGUST 2014			
TIME	**PROGRAM**	**WHO'S WHO**	**VENUE**
8.30am	Arrival/Registration	Secretariat	Foyer PULAZA
9.15 am – 9.30 am	Opening Ceremony	**Welcome speech by Chairperson:** Dr. Manmeet Mahinderjit Singh **Opening speech by Dean of SoCS:** Prof. Dr. Ahamad Tajudin Khader	Balik Pulau Setia
9.30 am – 10.30 am	Keynote I	Prof. Dr. Rosalina Abdul Salam Faculty of Science and Technology, USIM	Balik Pulau Setia
10.30 am – 11.00 am	Morning Tea @ Cafe		
11.00 am – 11.45 am	Parallel Session #1	I- Enabling Technologies & Infrastructures	Teluk Bahang 1
		II-Data to Knowledge	Teluk Bahang 2
		III- Service Computing	Teluk Bahang 3
11.45 am – 1.00 pm		Posters' evaluation (People's Choice Award)	Foyer Teluk Bahang
1.00 pm – 2.00 pm	Lunch @ Cafe		
2.00 pm - 2.45 pm	Keynote II	Prof. Dr. Ahamad Tajudin Khader School of Computer Sciences, USM	Balik Pulau Setia
2.45 pm – 3.30 pm	Parallel Session #2	I-Enabling Technologies & Infrastructures	Teluk Bahang 1
		II-Data to Knowledge	Teluk Bahang 2
		III- Service Computing	Teluk Bahang 3
3.30 pm – 4.15 pm	Parallel Session #3	I- Enabling Technologies & Infrastructures	Teluk Bahang 1
		II-Data to Knowledge	Teluk Bahang 2
		III- Service Computing	Teluk Bahang 3
4.15 pm – 5.15 pm	3 MT Competition	Panels: • Assoc. Prof. Dr. Cheah Yu-N (School of CS, USM) • Assoc. Prof. Dr. Dhanesh Ramachandram (School of CS, USM) • Dr. Mohd Hafizal Isa (School of HBP, USM) • Dr. Siti Ainor Mohd Yatim (School of DE, USM) • Dr. Mohd. Mahadi Halim (School of Phys, USM)	Balik Pulau Setia
5.15 pm - 5.45 pm	Tea break @ Cafe		
8.00 pm	Dinner @ Dewan Terbuka		

Event's Agenda

DAY 2: 27 AUGUST 2014			
TIME	**PROGRAM**	**WHO'S WHO**	**VENUE**
8.30 am – 9.00 am	Arrival / Registration	Secretariat	Foyer PULAZA
9.15 am - 10.15 am	Keynote III	Assoc. Prof. Dr. Krishnaswamy Jayaraman Graduate School of Business, USM	Balik Pulau Setia
10.15 am – 10.45 am	Morning Tea @ Cafe		
10.45 am – 11.30 am	Parallel Session #4	I- Enabling Technologies & Infrastructures	Teluk Bahang 1
		II-Data to Knowledge	Teluk Bahang 2
		III- Service Computing	Teluk Bahang 3
11.30 am – 12.15 pm	Parallel Session #5	I- Enabling Technologies & Infrastructures	Teluk Bahang 1
		II-Data to Knowledge	Teluk Bahang 2
		III- Service Computing	Teluk Bahang 3
12.15 pm – 1.00 pm	Parallel Session #6	I- Enabling Technologies & Infrastructures	Teluk Bahang 1
		II-Data to Knowledge	Teluk Bahang 2
		III- Service Computing	Teluk Bahang 3
1.00 pm – 2.00 pm	Lunch @ Cafe		
2.00 pm – 2.45 pm	Parallel Session #7	I- Enabling Technologies & Infrastructures	Teluk Bahang 1
		II-Data to Knowledge	Teluk Bahang 2
		III- Service Computing	Teluk Bahang 3
3.00 pm – 4.15 pm	Forum	**Topic:** **M³T (Motivate, Manage, Move and Timeliness)** **Moderator:** Dr. Nurul Hashimah Ahamed Hassain Malim **Panel:** PM. Dr. Nur'Aini Abdul Rashid Dr. Syaheerah Lebai Lutfi Dr. Mohd Heikal Husin Dr. Zarul Fitri Zaaba	Balik Pulau Setia

4.30 pm – 5.00 pm	Closing Ceremony
	(**4.30 pm** - Closing Remarks)
	(**4.45 pm** - Awards Presentations)
		Closing Remarks:
		1. PM. Dr. Cheah Yu-N (Deputy Dean Academic)
		Awards Presentations:
		• Best Impact Factor Paper
		• Best Presentation
		• Poster Awards
		  • Best Posters
		  - Category 1 – Early Stage
		  - Category 2 – Intermediate Stage
		  - Category 3 – Advanced Stage
		  • People's Choice
		• 3MT Winners
			Balik Pulau Setia

5.00 pm	Tea break @ Cafe		

What is 3MT?

3MT® or Three Minute Thesis, is a research communication competition which was adopted from The University of Queensland. The first 3MT was held at The University of Queensland in 2008 with 160 RHD students competing. Enthusiasm for the 3MT concept grew and its widespread implementation by universities has led to the development of an international competition which is supported and adopted by universities in many countries such as Australia, New Zealand, Canada, the United States, the United Kingdom and Vietnam. This competition, first to be practiced in the Northern Malaysia by USM is open to all postgraduate students, especially students in their 2nd year of study. The 3MT challenges students to present a compelling oration on their thesis and its significance in just three minutes in language appropriate to a non-specialist audience. 3MT is not an exercise to discourage or downgrade a research project but forces students to consolidate their ideas and improve their research discoveries.

The competition involves participants presenting their research in an interesting and convincing manner in just 3 minutes to an audience that may not be from the same research area. Indirectly, this competition allows the participants to develop their presentation, and research communication skills to effectively explain their research in language appropriate to a non-specialist audience. The judging criteria is based mainly on the presentation skills, gesture, confidence and contents of the presentation. Further judging criterias are shown below:

• Comprehension:
  - Did the presentation provide an understanding of the background to the research question being addressed and its significance?
  - Did the presentation clearly describe the key results of the research including conclusions and outcomes?
  - Did the presentation follow a clear and logical sequence?

• Engagement:
  - Did the oration make the audience want to know more?
  - Was the presenter careful not to trivialise or generalise their research?
  - Did the presenter convey enthusiasm for their research?
  - Did the presenter capture and maintain their audience's attention?

• Communication:
  - Was the thesis topic, key results and research significance and outcomes communicated in language appropriate to a non-specialist audience?
  - Did the speaker avoid scientific jargon, explain terminology and provide adequate background information to illustrate points?
  - Did the speaker have sufficient stage presence, eye contact and vocal range; maintain a steady pace, and have a confident stance?
  - Did the presenter spend adequate time on each element of their presentation - or did they elaborate for too long on one aspect or was the presentation rushed?
  - Did the PowerPoint slide enhance the presentation - was it clear, legible, and concise?

3MT Rules & Participants List

What are the rules for participants?

• A single (1) static PowerPoint slide is permitted (no slide transitions, animations or 'movement' of any description, the slide is to be presented from the beginning of the oration).
• No additional electronic media (e.g. sound and video files) are permitted.

• No additional props (e.g. costumes, musical instruments, laboratory equipment) are permitted.

• Presentations are limited to 3 minutes maximum and competitors exceeding 3 minutes are disqualified.

• Presentations are to be spoken word (e.g. no poems, raps or songs).

• Presentations are to commence from the stage.

• Presentations are considered to have commenced when a presenter starts their presentation through movement or speech.

• The decision of the adjudicating panel is final.

The panels are: Assoc. Prof. Dr. Cheah Yu-N (School of Computer Sciences, USM)
Assoc. Prof. Dr. Dhanesh Ramachandram (School of Computer Sciences, USM)
Dr. Mohd Hafizal Isa (School of Housing, Building & Planning, USM)
Dr. Siti Ainor Mohd Yatim (School of Distance Education, USM)
Dr. Mohd. Mahadi Halim (School of Physics, USM)

List of Participants

No.	Participant's Name	Presentation Title	Country of Origin
1.	Ahmed Abusaina	Adapting and Enhancing Mussels Wandering Optimization Algorithm for Supervised Training of Neural Networks	Palestine
2.	Amal Abdulaziz Abdullah Abdulrahman	Automatic Emotion Recognition Through Facial Expressions	Yemen
3.	Lim Chia Yean	Is Contextualisation a Silver Bullet to Better Understanding a Critical Issue?	Malaysia
4.	Mohd Nor Akmal Khalid	Optimizing Crowd Evacuation Plan in The Emergency Route Planning Problems	Malaysia
5.	Muhannad Abdul-Qader Abu-Hashem	Filtered Distance Matrix for Constructing High Throughput Multiple Sequence Alignment on Protein Data	Jordan
6.	Nazi Tabatabaei Yazdi	Save Money with Cloud Agents	Iran
7.	Nur Fatin Bari'ah	Exam Schedule for Postgraduate, 3 Hours Only? Sufficient or Not?	Malaysia
8.	Osama Nasif Ahmad	Modeling of Realistic Emergency Evacuation Dynamics of High Density Crowds During Hajj	Syria
9.	Pantea Keikhosrokiani	Design and Assessment of Location-Based Mobile Cardiac Emergency System (LMCES)	Iran
10.	Rahma A. Kamaludeen	Preservation, Utilization and Maintenance of Software Expert Maintainer's Knowledge	Malaysia
11.	Anusha Achuthan	Automated Identification of Human Memory Related Anatomical Structure in the Brain	Malaysia
12.	Azleena Mohd Kassim	Knowledge-based Coalition Formation using Social Factors	Malaysia

Day 1 Tuesday (26/8/2014)
Track: Enabling Technologies and Infrastructures
Venue: Teluk Bahang 1

Session 1

11.00am – 11.45am	**RR01**	**Analysis and Design of Improved Chaotic Crytographic Primitives Based on Complexity and Period Length Perspective** Presenter: Amir Akhavan Supervisor: Assoc. Prof. Dr. Azman Samsudin Panels: Assoc. Prof. Dr. Aman Jantan, Assoc. Prof. Dr. Nur'Aini Abdul Rashid, Dr. Zarul Fitri Zaaba

Session 2

2.45pm – 3.30pm	**PR12**	**A Novel Symmetric Encryption Scheme Based on Non-determinism and Chaotic Maps** Presenter: Teh Je Sen Supervisor: Assoc. Prof. Dr. Azman Samsudin Panels: Assoc. Prof. Dr. Aman Jantan, Dr. Manmeet Kaur Mahinderjit Singh, Dr. Wong Li Pei

Session 3

3.30pm – 4.15pm	**PR11**	**Detecting Neighbour Discovery Protocol (NDP) Attacks in IPv6 Network using Real-Valued Negative Selection (RNS) Algorithm** Presenter: Nazrool Omar Supervisor: Assoc. Prof. Dr. Bahari Belaton Panels: Prof. Dr. Ahamad Tajudin Khader, Assoc. Prof. Dr. Aman Jantan, Dr. Selvakumar Manickam

Day 1 Tuesday (26/8/2014)
Track: Data to Knowledge
Venue: Teluk Bahang 2

Session 1

11.00am – 11.45am	**PR03**	**A Pattern Based Malay Language Summarizer via Semantic Similarity Approach** Presenter: Suraya Alias Supervisor: Dr. Siti Khaotijah Mohammad Panels: Assoc. Prof. Dr. Cheah Yu-N, Dr. Wong Li Pei, Dr. Gan Keng Hoon

Session2

2.45pm – 3.30pm	**PR14**	**A Hybrid Medical Image Segmentation Algorithm using Watershed Region-based and Fuzzy C-Means (FCM) Clustering Algorithms** Presenter: Mogana Vadiveloo Supervisor: Prof. Dr. Rosni Abdullah & Prof. Dr. Mandava Rajeswari Panels:Assoc. Prof. Dr. Dhanesh Ramachandram, Assoc. Prof. Dr. Nur'Aini Abdul Rashid, Assoc. Prof. Dr. Bahari Belaton

Session 3

3.30pm – 4.15pm	**PR15**	**Liver Tumor Segmentation using Ensemble Learning Approach** Presenter: Chung Sheng Huang Supervisor: Prof. Dr. Mandava Rajeswari Panels: Prof. Dr. Abdullah Zawawi Hj. Talib, Assoc. Prof. Dr. Cheah Yu-N, Puan Intan Raihana Ruhaiyem

Day 1 Tuesday (26/8/2014)
Track: Service Computing
Venue: Teluk Bahang 3

Session 1

11.00am – 11.45am	**PR17**	**Ubiquitous Hajj Learning and Training System Based on Hybrid Learning Design Utilizing Blended Learning Technique** Presenter: Rayan Yousif Yacob Alkhayat Supervisor: Assoc. Prof. Dr. Muhammad Rafie Hj. Mohd Arshad Panels: Dr. Syaheerah Lebai Lutfi, Dr. Fadratul Hafinaz Hassan, Puan Rosnah Idrus

Session2

2.45pm – 3.30pm	**PR04**	**Health Informatics: Management of Information Systems** Presenter: Mohd Idzwan Mohd Salleh Supervisor: Prof. Dr. Rosni Abdullah & Dr. Nasriah Zakaria Panels: Assoc. Prof. Dr. Cheah Yu-N, Assoc. Prof. Dr. Muhammad Rafie Hj. Mohd Arshad, Puan Rosnah Idrus

Session 3

3.30pm – 4.15pm	**PR06**	**A Storytelling-based Approach to Program Comprehension during Software Maintenance** Presenter: Rozita Kadar Supervisor: Dr. Sharifah Mashita Syed Mohamad Panels: Assoc. Prof. Dr. Putra Sumari, Dr. Vincent Khoo Kay Teong, Dr. Syaheerah Lebai Lutfi

Day 2 Wednesday (27/8/2014)
Track: Enabling Technologies and Infrastructures
Venue: Teluk Bahang 1

Session 4

10.45am – 11.30am	**PR01**	**Flowgraph Models for Authentication Process in RFID system** Presenter: Tan Aik Theng Supervisor: Dr. Zurinahni Zainol Panels: Assoc. Prof. Dr. Wan Tat Chee, Assoc. Prof. Dr. Cheah Yu-N, Dr. Azizul Rahman Mohd Shariff

Session 5

11.30am – 12.15pm	**PR16**	**Performance Study of Traffic Congestion Based on BIG DATA Statistics by Touch N'Go *** Presenter: Farah Nuzaily Zakaria Supervisor: Dr. Azizul Rahman Mohd Shariff Panels: Assoc. Prof. Dr. Bahari Belaton, Assoc. Prof. Dr. Putra Sumari

Session 6

12.15pm – 1.00pm	**PR08**	**Fully Homomorphic Encryption Scheme for Outsourced Big Data Computation** Presenter: Tan Soo Fun Supervisor: Assoc. Prof. Dr. Azman Samsudin Panels: Assoc. Prof. Dr. Nur'Aini Abdul Rashid, Dr. Manmeet Kaur Mahinderjit Singh, Dr. Zarul Fitri Zaaba

Session 7

2.00pm – 2.45pm	**PR02**	**A Novel Medium Access Control Protocol for Multi-hop Real Time Applications in Wireless Sensor Networks** Presenter: Mohd Ali Sarvghadi Supervisor: Assoc. Prof. Dr. Wan Tat Chee Panels: Dr. Azizul Rahman Mohd Shariff, Dr.Mohd Adib Haji Omar, Dr. Yap Fa Toh

***** Denotes a MSc proposal review

Day 2 Wednesday (27/8/2014)
Track: Data to Knowledge
Venue: Teluk Bahang 2

Session 5

11.30am – 12.15pm	**PR05**	**MaDITS: Malay Dialect Translation and Synthesis System** Presenter: Jasmina Khaw Yen Min Supervisor: Dr. Tan Tien Ping Panels: Dr. Gan Keng Hoon, Dr.Syaheerah Lebai Lutfi, Dr. Siti Khaotijah Mohammad

Session 6

12.15pm – 1.00pm	**PR10**	**Answering Non-Factoid in Open Domain using Expected Answer Type (EAT)** Presenter: Muhammad Ikhsan Azizan Supervisor: Assoc. Prof. Dr. Cheah Yu-N Panels: Assoc. Prof. Dr. Chan Huah Yong, Assoc. Prof. Dr. Dhanesh Ramachandram, Dr. Gan Keng Hoon

Session 7

2.00pm – 2.45pm	**PR07**	**Answering question using Accumulated Answers in Community Question Answering Services** Presenter: Lee Jun Choi Supervisor: Assoc. Prof. Dr. Cheah Yu-N Panels: Assoc. Prof. Dr. Chan Huah Yong, Assoc. Prof. Dr. Dhanesh Ramachandram, Dr. Gan Keng Hoon

Day 2 Wednesday (27/8/2014)
Track: Service Computing
Venue: Teluk Bahang 3

Session 4

10.45am – 11.30am	**PR09**	**Visualizing Genogram: Techniques and Tools for Exploring Medical Family Tree ***
		Presenter: Siti Fatimah Bokhare
		Supervisor: Dr. Wan Mohd Nazmee Wan Zainon
		Panels: Assoc. Prof. Dr. Putra Sumari, Dr. Mohd Adib Haji Omar

Session 5

11.30pm – 12.15pm	**PR13**	**Personality Detection in Online Social Networking by Using Three Factor Personality Model ***
		Presenter: Saravanan Sagadevan
		Supervisor: Dr. Nurul Hashimah Ahamed Hassain Malim & Dr. Mohd Heikal Husin
		Panels: Assoc. Prof. Dr. Cheah Yu-N, Dr. Manmeet Kaur Mahinderjit Singh

***** Denotes a MSc proposal review

Proposal Review

Track: Enabling Technologies and Infrastructures

PR01 **Flowgraph Models for Authentication Process in RFID system** 24
Presenter: Tan Aik Theng

PR02 **A Novel Medium Access Control Protocol for Multi-hop Real Time Applications in Wireless Sensor Networks** 24
Presenter: Mohd Ali Sarvghadi

PR08 **Fully Homomorphic Encryption Scheme for Outsourced Big Data Computation** 25
Presenter: Tan Soo Fun

PR11 **Detecting Neighbor Discovery Protocol (NDP) Attacks in IPv6 Network using Real-Valued Negative Selection (RNS) Algorithm** 26
Presenter: Nazrool Omar

PR12 **A Novel Symmetric Encryption Scheme Based on Non-determinism and Chaotic Maps** 26
Presenter:Teh Je Sen

PR16 **Performance Study of Traffic Congestion based on BIG DATA Statistics by Touch N' Go** 27
Presenter: Farah Nuzaily Zakaria

Track: Data to Knowledge

PR03 **A Pattern Based Malay Language Summarizer via Semantic Similarity Approach** 28
Presenter: Suraya Alias

PR05 **MaDITS: Malay Dialect Translation and Synthesis System** 28
Presenter: Jasmina Khaw Yen Min

PR07 **Answering Question using Accumulated Answers in Community Question Answering Services** 29
Presenter:Lee Jun Choi

PR10 **Answering Non-Factoid in Open Domain using Expected Answer Type (EAT)** 29
Presenter: Muhammad Ikhsan Azizan

PR11 **Detecting Neighbor Discovery Protocol (NDP) Attacks in IPv6 Network using Real-Valued Negative Selection (RNS) Algorithm** 30
Presenter: Nazrool Omar

PR14 **A Hybrid Medical Image Segmentation Algorithm using Watershed Region-based and Fuzzy C-Means (FCM) Clustering Algorithms** 30
Presenter: Mogana Vadiveloo

PR15 **Liver Tumor Segmentation using Ensemble Learning Approach** 31
Presenter: Chung Sheng Huang

Track: Service Computing

PR04 **Health Informatics: Management of Information Systems** 32
Presenter: Mohd Idzwan Mohd Salleh

PR06 **A Storytelling-based Approach to Program Comprehension during Software Maintenance** 32
Presenter: Rozita Kadar

PR09 **Visualizing Genogram: Techniques and Tools for Exploring Medical Family Tree Data** 33
Presenter:Siti Fatimah Bokhare

PR13 **Personality Detection in Online Social Networking by Using Three Factor Personality Model** 33
Presenter: Saravanan Sagadevan

PR17 **Ubiquitous Hajj Learning and Training System based on Hybrid Learning Design utilizing Blended Learning Technique** 34
Presenter: Rayan Yousif Yacob Alkhayat

Research Review

Track: Enabling Technologies and Infrastructures

RR01 **Analysis and Design of Improved Chaotic Cryptographic Primitives based on Complexity and Period Length Perspective** 35
Presenter: Amir Akhavan

Poster

PO01	**Patients Profile Analytics for Predicting Rehabilitation Readmission on Malaysian Drug Addicts using Hybrid Data Mining Techniques** Presenter: Amirah Binti Mohamed Shahiri	36
PO02	**Enhanced Intelligent Water Drops Algorithms and their Applications to Optimization Problems** Presenter: Basem O. F. Alijla	36
PO03	**Integrating the BCO framework with a pruning strategy based on frequent closed pattern** Presenter: Cheah Siew Lee	37
PO04	**A bee colony optimization for scheduling problem with shifting bottleneck approach** Presenter: Choo Wai Mun	37
PO05	**A Dynamic Fuzzy-Based Dances Mechanism in Bee Colony Optimization Algorithm** Presenter: Choong Shin Siang	37
PO06	**Harmony Search based Hyper-Heuristic for Timetabling and Scheduling Problems** Presenter: Khairul Bin Anwar	38
PO07	**Reinforcement Learning based Brain Fiber Tracking Model** Presenter: Khosrow Amiri Zadeh	38
PO08	**Personalization of Tweets for Trending Topics** Presenter: Lu Wei Lin	39
PO09	**A Study of Emotional to Improve the Learning Performance Using Virtual Tutor Intelligent Agent** Presenter: Najlaa Sadiq Binti Mokhtar	39
PO10	**Supplier evaluation measurement : Criteria (feature) selection in Supplier Performance Measurement System** Presenter: Nor Shafina Bt Shaharuddin	40
PO11	**Test Analytic Framework to Support Test Managers in Making Decisions** Presenter: Nur Hafizah Binti Haron	40
PO12	**Flash Cache Management Policy for Large-scale Video-on-Demand Hybrid Storage Server** Presenter: Ola Ahmed Mohammed Al-Wesabi	41
PO13	**Modelling of Realistic Emergency Evacuation Dynamics of High Density Crowds during Hajj** Presenter: Osama Nasif Ahmad	41
PO14	**An Acceptance of Mobile Learning for Children in Primary Schools in Egypt** Presenter: Reham Adel Ali Abdelwahed	42
PO15	**Opinion Summarization using Multi Criteria Decision Making (MCDM)** Presenter: Saif Addeen Ahmad Ali Alrababah	42
PO16	**Medical Tourism on Mobile Application in Thailand** Presenter: Sareeya Ben-Arlee	43
PO17	**CALM: An Architecture for Context Aware Semantic Dashboards by Harnessing Linked Open Data Cloud on Streamlined Web Mining Data** Presenter: Thineswaran A/L Gunasegaran	43
PO18	**Enhanced Methods for Recognition and Identification of Fish Swimming Patterns** Presenter: Wong Poh Lee	44

PO19	**Distributing Node Density In Mobile Adhoc Network (MANET) To MANET Gateways** Presenter: Primantara Hari Trisnawan	45
PO20	**GPGPU: Acceleration of the Phylogenetic Tree Construction** Presenter:Najihah binti Ibrahim	46
PO21	**Image-based Information Hiding Scheme using Diamond Encoding** Presenter: Samer Hassan Suleiman Atawneh	46
PO22	**Affective Computing** Presenter: Zaaba bin Ahmad	47
PO23	**Improving IPv6 Neighbor Discovery Security using Trust-ND** Presenter: Supriyanto	47
PO24	**H.264 Tiling: A New Parallel and Quality-Aware Approach for Parallelizing H.264 Codec** Presenter: Mohammed F. Eessa	47
PO25	**Improving Reliability and Security in IPv6 Duplicate Address Detection Mechanism** Presenter: Shafiq Ul Rehman Hakeem	47
PO26	**A Framework to Mitigate Botnet-based Hypertext Transfer Protocol Flooding Attacks on Web Servers** Presenter: Esraa Saleh Hasoon	48
PO27	**An Intelligent Framework for ICMP Flooding Attack Detection in IPv6 Network Based on Artificial Neural Network** Presenter: Redhwan Mohammed Ahmed Saad	48
PO28	**Analytical Modelling of Connectivity of Inter-Vehicular Communications in Fading Channels** Presenter: Sabri Mohammed Abdhood Hanshi	49

Proposal Review

Track: Enabling Technologies and Infrastructures

Flowgraph Models for Authentication Process in RFID system

Tan Aik Theng

Abstract

In real world applications of RFID system, RFID database is required to handle multiple RFID readers at the same time in order to have better coverage areas of receiving data. Thus, each RFID reader accessed time to RFID database should be limited to certain of time else it will cause network congestion on RFID database. By knowing actual total time required by a single RFID reader to complete its authentication task with specific number of existence RFID tags, administrator can configure on RFID database when it should terminate verification process and start new authentication event with other RFID readers. This will help RFID database to automatically establish a new communication event with other RFID readers when there is no response from existing RFID reader after certain of time. Besides that, collision between RFID readers is a common scenario in applications of RFID system. It is possible to see dual RFID readers to perform authentication data with a single RFID tag at the same time whereby signal of each RFID reader is overlapped with each other. Likely, this scenario will be seen in application of mobile RFID reader. But, it causes collision when two RFID readers are turned on simultaneously to communicate with a single RFID tag. In order to resolve this issue, a proper timing of channel access on RFID tag should be implemented to avoid collision between RFID readers. In this research work, we are going to use flowgraph model as a tool to estimate total time required by a single RFID reader to communicate with dual RFID tags, and total time required by interfered RFID reader to deactivate its radio frequency signal when its first attempt to communicate with RFID tag is failed. Based on flowgraph model presented from our research work, information such as moment generating function for each authentication process in RFID system, and probability of transition to next authentication task in RFID system are available.

A Novel Medium Access Control Protocol for Multi-hop Real Time Applications in Wireless Sensor Networks

Mohd Ali Sarvghadi

Abstract

In multi-hop wireless sensor network a highly stringent time scheduling is required to pass the real time information to the base station on time and avoid collision which subsequently results in consuming less energy. Time division multiple access is a promising algorithm to achieve this goal. Of course, to employ this algorithm synchronizing the network nodes' clock is a foundation. This proposal, suggests a time synchronization protocol which is simple, light, without heavy computation load, and reduces the energy consumption in comparison to the existing protocols. Then, it proposes how to assign time slots to the nodes in multi-hop scenario in the way that hidden terminal problem is relaxed and the min imum latency for messages to meet the base station is achieved. The algorithm will be mathematically proved and evaluated by means of a wireless sensor network testbed to validate real mode behavior of the proposed protocol.

Fully Homomorphic Encryption Scheme for Outsourced Big Data Computation

Tan Soo Fun

Abstract

Homomorphic Encryption has undoubtedly become an active research area in securing big data outsourced computation. It enables enterprise to protect confidentiality and privacy of their outsourced data, meanwhile allows un-trusted third parties to perform some computation on these encrypted data without decrypting and acce ssing them. Recently, several efforts were focused on improving the speed performance and versatility of Fully Homomorphic Encryption (FHE) scheme. However, vast majority of these FHE schemes are constructed based on ideal lattices approach, which still inefficient enough for the real-world deployment due to their high computing requirement. Therefore, whether these FHE schemes can be further adopted directly for securing outsourced computation in big data is questionable. The motivation of this research is to explore a new way for constructing practical FHE scheme. Some conventional algebraic cryptosystem enjoys some sorts of homomorphism. These systems are very efficient and well-established in real-world deployment. However, they are considered as Partial Homomorphic Encryption (PHE) scheme as their low versatility. PHE scheme is homomorphic encryption scheme that has a low versatility, which only able to performone type of computational operation, either additive or multiplicative homomorphism. This research demonstrates how to exploit the advantages of these efficient conventional cryptosystems and transform them into FHE scheme in order to secure big data outsourced computation. The first part of this research focuses on studying the conventional algebraic cryptosystem in order to find suitable PHE candidate that isviable to bootstrap into FHE scheme. The main issue in finding a suitable PHE candidate in this purpose are speed performance, versatility of homomorphism, license and security issues. The second part of this research concentrates on improving the speed performance of the selected PHE, as the PHE initial algorithm design does not tailored to meet the high velocity challenges of big data processing. A variant of PHE scheme with a high speed performance in order to support high velocity of big data processing is further proposed. Next, this research focuses on transforming the proposed variant of PHE scheme into FHE scheme that able to support both additive and multiplicative homomorphism. The final part of this research focuses on security analysis and performance assessment of the proposed scheme. The security analysis will applied the unconditional approach. The result of security analysis is expected to prove that the proposed scheme is secure against chosen-plaintext attacks (IND-CPA) and chosen-ciphertext attacks (CCA1). Meanwhile, the result of performance assessment is expected to show that the proposed is able to perform faster than existing FHE scheme without sacrificing security.

Detecting Neighbor Discovery Protocol (NDP) Attacks in IPv6 Network using Real-Valued Negative Selection (RNS) Algorithm

Nazrool Omar

Abstract

Attacks against Neighbor Discovery Protocol (NDP) in Internet Protocol version 6 (IPv6) exist due to vulnerabilities found in the protocol. It gains more interest among hackers because attacking toolkits such as THC IPv6 toolkit and Si6 Network IPv6 toolkit are now available in Internet. The increase of IPv6 deployment in organizations all over the world demands security expert attention to this problem. It is a requirement for network administrator to have security safeguard to detect and eliminate NDP attacks in protecting their IPv6 network. Researcher have addressed this problem by proposing IPSec, Secure NDP (SeND) and other methods. Encrypt IPv6 network traffic using IPSec or enforce SeND implementation require enormous processing power from IPv6 nodes and super systematic PKI key management plan for the network. Monitoring and detecting tools such as intrusion detection system (IDS) on the other hand is more practical solution because no change to NDP is needed and does not interrupt computing power of IPv6 nodes. IDS is deployed as a probe and will monitor IPv6 network for intrusive activities. IDS could monitor NDP related attacks solely based on signatures but it would not be very effective because attacks can be crafted as many patterns and variants. Therefore this paper proposes an intelligent anomaly detection IDS to detect NDP attacks. The proposed IDS provides detection mechanism by defining normal and anomaly profile using Real-Valued Negative Selection (RNS) algorithm and analyzing every live traffic against the profiles to detect deviations. The mechanism enables IDS to detects many variants of NDP attacks.

A Novel Symmetric Encryption Scheme Based on Non-determinism and Chaotic Maps

Teh Je Sen

Abstract

In today's world of information technology, cryptography has become an important subject because large amounts of data is being shared through unsecured channels. Symmetric encryption is one of the most important cryptographic primitives that play a heavy role in ensuring data security. The main fields that are being employed in symmetric encryption algorithms include bit manipulation, chaos theory and artificial neural networks (ANN). Bit manipulation algorithms rely on basic bitwise operations whereas chaos theory and ANNs utilize their inherent qualities such as non-linearity, sensitivity to initial conditions and pseudo randomness to design cryptographic algorithms. However, these methods can be statistically cryptanalyzed because they are deterministic, whereby each plaintext corresponds to only one ciphertext for a particular secret key. This research aims to design a new symmetric encryption scheme that is non-deterministic and therefore resistant to statistical-based cryptanalytic efforts. Even with the same secret key, the encrypted plaintext messages will never be mapped to the same ciphertext. Besides that, multiple chaotic maps and a Feistel-based mixing topology will also be employed to ensure that the proposed scheme has strong diffusion and confusion capabilities. The proposed scheme will undergo statistical tests for randomness and its resistance against cryptanalytic methods will be analyzed. The outcome of this research is a secure, non-deterministic symmetric encryption scheme that renders traditional statistical attacks obsolete.

Performance Study of Traffic Congestion based on BIG DATA Statistics by Touch N' Go

Farah Nuzaily Zakaria

Abstract

Living in an urban area where population is high comes with major traffic challenges. Travelling from point A to point B in the early morning rush or during peak seasons is now a major and daily issue within the community. Among the many efforts taken by the government authorities in Malaysia in tackling this major issue are such as widening roads and junctions, planning more freeways and elevated highways, adding more routes in major cities, imposing police controls at major junctions during rush hours, introducing cashless mechanism for vehicles surpassing toll booths and many more. With the increasing volume of vehicles on the road, a more practical approach of managing traffic needs to be ventured. The purpose of this research is to study traffic congestions at toll booths operating Touch N' Go services within Kuala Lumpur parameters. Using a pool of data collected by Touch N' Go, traffic patterns at tolling gates are being studied to identify causes of congestions. This could be due to as simple as the duration it takes from the card touch point to the time it takes for the gate bars to lift up to as complicated as Touch N' Go lane segregation. More causes could be established once the data provided by the consortium is mined, simulated and transformed into meaningful information related to traffic patterns. By studying the traffic ecosystem, we can predict the number of users surpassing a tolling gate using the cashless card in a day or even months and propose a solution to ease up congestion. Simulating traffic at tolling gates using actual data provides a non-invasive approach of understanding traffic behaviors and grants us the opportunity to play around with the number of objects by adding or reducing the volume of data. Correlating this research with networking technologies, it is hoped that once a traffic pattern is obtained, an infrastructure can be developed to have vehicles communicate with Road-Side-Units which will direct users to a certain lane at tolling gates, hence reducing congestion

A Pattern Based Malay Language Summarizer via Semantic Similarity Approach

Suraya Alias

Abstract

Document Summarization task is to produce a condensed representation (summary) by extracting information, intended for human consumption without losing the relevant information, thus making it a challenging and promising field. A Pattern based approach in the area of Document Summarization is still considered as green and exploratory. However, earlier Pattern-based methods in Text Mining domain such as Text Categorization and Pattern Identification have been a promising start. The Textual Pattern here refers to a sequence of items or sentences that appears in the document collections. By discovering these textual patterns is essential, since the patterns can describe the text by preserving the sequential order of the words in the document. A pattern-based method is propo sed in summarizing multiple Malay news articles by incorporating the semantic knowledge in order to provide users the insight of the extracted non-redundant news information.

MaDITS: Malay Dialect Translation and Synthesis System

Jasmina Khaw Yen Min

Abstract

Malay is a language from the Austronesian family. It is the official language in Malaysia, Indonesia, Singapore, and Brunei. However, Malay spoken in different countries, and even within a country itself might vary in terms of pronunciation and vocabulary from one place to another. The Malay dialects in Malaysia can be grouped according to the states of the country. In this study, an architecture of a Malay dialect translation and synthesis system was proposed, that given a sentence in standard Malay, it translates and synthesizes an utterance in the dialect requested. The system consists of 3 modules, dialect translation system, dialect G2P system, and speech synthesis system. The outcome from this study is two folds. From linguistic viewpoint, it will help us understanding and appreciating the interesting differences of Malay dialects in Malaysia, which is important to help preserve the dialect and culture in it. Secondly, the proposed system will be useful for people who like to learn a particular dialect or it can be used in places that require this facility.

Answering Question using Accumulated Answers in Community Question Answering Services

Lee Jun Choi

Abstract

Community Question Answering Service provides an online platform for people to seek answers from the public. It is a problem solving method using public intelligent, which also known as crowd sourcing. Each response presented in Community Question Answering Service is generated by public. This means the repository for Community Question Answering Service is a huge knowledge pool on the web. Community Question Answering Services also initiated numerous research opportunities such as question classification, experts routing, and answer quality prediction. Answer generation is also one of the research topic for Community Question Answering Service. One of the methods applied by researchers is to generate answer for a new question using best answer from relevant ques tion in the Community Question Answering Services. This study expands from such studies and integrates the summarization technique to enhance the answer generation process. This question answering technique will be evaluated through the user acceptance of the summarized answers by comparing it to other answers. This study will also attempt to optimize the question answers retrieval from online Community Question Answers repository. This is done through identifying the best parameter to retrieve relevant question answer set from the online Community Question Answers repository. Lastly, this study also explores the use of semantic relatedness in measuring answer quality in Community Question Answering Services.

Answering Non-Factoid in Open Domain using Expected Answer Type (EAT)

Muhammad Ikhsan Azizan

Abstract

Question Answering (QA) research is a study that deals with the information-overload problem. Users use Question Answering Systems (QASs) by inputting natural language questions and the system will provide the answer from online or offline repositories. Therefore every QAS must be able to understand the questions' intention and meaning before searching for related data and information in the repository. The information found and retrieved are collected as candidate answers. They will be measured and ranked in terms of accuracy before selected as the best answer. Most of the current QASs and research deal mostly with factual/factoid questions which are more direct in meaning and answer. Non-factoid questions are harder to represent and to interpret their meaning and intention, and leading to difficulty in providing the corre ct answer. However, non-factoid questions cannot be ignored for QAS as they are also relevant in QA applications. Most researches in non-factoid questions attempted to limit the QA domain, only a few studies attempted them in open domain. However, the studies in open domain result are not encouraging in terms of candidate answer recall and final answer accuracy. This study aims to understand non-factoid questions by implementing EAT in QAS by manipulating the discourse structure of question and answer. This study also aims to increase the question types used in the system and the recall of the candidate answers. The study will be evaluated based on accuracy of the final answer.

Detecting Neighbor Discovery Protocol (NDP) Attacks in IPv6 Network using Real-Valued Negative Selection (RNS) Algorithm

Nazrool Omar

Abstract

Attacks against Neighbor Discovery Protocol (NDP) in Internet Protocol version 6 (IPv6) exist due to vulnerabilities found in the protocol. It gains more interest among hackers because attacking toolkits such as THC IPv6 toolkit and Si6 Network IPv6 toolkit are now available in Internet. The increase of IPv6 deployment in organizations all over the world demands security expert attention to this problem. It is a requirement for network administrator to have security safeguard to detect and eliminate NDP attacks in protecting their IPv6 network. Researchers have addressed this problem by proposing IPSec, Secure NDP (SeND) and other methods. Encrypt IPv6 network traffic using IPSec or enforce SeND implementation require enormous processing power from IPv6 nodes and super systematic PKI key management plan for the network. Monitoring and detecting tools such as intrusion detection system (IDS) on the other hand is more practical solution because no change to NDP is needed and does not interrupt computing power of IPv6 nodes. IDS is deployed as a probe and will monitor IPv6 network for intrusive activities.

A Hybrid Medical Image Segmentation Algorithm using Watershed Region-based and Fuzzy C-Means (FCM) Clustering Algorithms

Mogana Vadiveloo

Abstract

Watershed algorithms, which fall under region-based segmentation algorithms, are among the most popular methods and been used extensively for medical image segmentation. However, two main issues plague these region-based segmentation algorithms: over segmentation and leakages in segmenting the given medical image dataset. This study aims to solve these problems using a hybrid algorithm approach combining region-based and fuzzy clustering algorithms. First the fuzzy clustering algorithm, known as the Fuzzy C-Means (FCM) is integrated into watershed algorithm; where a Region Adjacency Graph (RAG) is constructed from these algorithms. Secondly, a metaheuristic approach, known as the Simulated Annealing (SA) is used to optimize the RAG for final graph merging. This hybrid algorithm is to be applied to brain Magnetic Resonance Image (MRI) to segment the White Matter (WM), Grey Matter (GM) and Cerebrospinal Fluid (CSF) structures in brain and shall be extended to other medical images as well. The hybrid algorithm is expected to produce accurate segmentation results.

Liver Tumor Segmentation using Ensemble Learning Approach

Chung Sheng Huang

Abstract

The main problems that are faced by liver tumor identification and classification from CT images are related to the contrast level between tumor and healthy liver intensities. The characteristics of lesions are often similar to those of the surrounding normal tissues and the tumoral tissue can be found identical to the intensities of the gallbladder with additional constraints and factors such as size, number, shape, margin definition or enhancement pattern in different contrast phases. Due to the large variability in the appearances and intensities of liver tumors that contribute to difficulties during detection, the liver tumor segmentation using ensemble learning approach is proposed in separating tumoral and healthy liver tissues. The main objective the proposed work is to perform liver tumor segmentation by combining the predictions of an ensemble to improve the accuracy of the segmentation result s than the use of individual classifiers. The ensemble learning methods such as bagging and boosting combine potential useful features by incorporating weak classifiers to create a strong classifier in image segmentation. In this proposed study, the use of the ensemble learning approach aims to compensate imperfect search processes in providing liver tumor ensemble classification and approximation. The proposed research tries to highlight possible solutions for liver tumor segmentation in CT images and to identify optimal classifiers in liver tumor classification.

Health Informatics: Management of Information Systems

Mohd Idzwan Mohd Salleh

Abstract

This proposal recommended the study to examine the impact of electronic health record (EHR) usage towards improving user performance and health care quality in the Malaysian government hospitals. In particular, the study will explore the human, technological, and organisational factors that may predict the performance of health care providers in achieving better quality of care. On the basis of the review of related research and literature, the proposed study outlined a comprehensive practical theoretical framework that models the fit between human, technological, and organisational factors in order to be the best indicator and performance measurement tool for health care quality associated from EHR use . To attain this, quantitative method will be employed to validate the existing factors as well as to explore new effects and relationships among possible contributing factors for assessing quality of health care service delivery.

A Storytelling-based Approach to Program Comprehension during Software Maintenance

Rozita Kadar

Abstract

Presently, much effort has been allocated in maintaining existing software system compared to developing a new one. Software maintenance is the process of changing or modifying a software system once it is operational. The main goal of software maintenance is to improve the quality of a software system whenever there are new enhancements or other requirements. Program comprehension is another important process carried out that involves much effort before the software maintenance process. Program comprehension is defined as a process of understanding source code in which a person who understands a source code is able to explain the structure, behavior and the relationship of a program to its application domain. A key challenge to developers in program comprehension process is to comprehend a source cod e. Nowadays, the software system has grown in size, which increases the developers' task in exploring and understanding millions of lines of source code. The source code is a crucial resource for developers to become familiar with a software system since some system documentation is often unavailable or outdated. However, there exists a problem in understanding source codes which has tricky codes, different programming styles, insufficient comments, architectures, components, and many more. Although there are many researches that have discussed the different strategies and techniques to overcome the program comprehension problem, there exists only a shallow knowledge about the challenges developers face when trying to understand a software system through reading source code. Thus, an extensive study should be done to help developers in exploring and understanding source code in order to ease program comprehension prior to the actual software maintenance process. Therefore, this study attempts to overcome the problem of program comprehension by suggesting a suitable program comprehension technique to support developers while performing software maintenance tasks. The proposed technique is based on a storytelling approach. Storytelling is able to explain the situation or scenario of the software system more easily. Later, this work will develop a tool that is expected to meet the needs of developers. The proposed work will create a better way in improving program comprehension. Therefore, this idea can provide the intuitive environment and valuable input to the developers in the process of understanding software system.

Visualizing Genogram: Techniques and Tools for Exploring Medical Family Tree Data

Siti Fatimah Bokhare

Abstract

Family trees have existed for a long time. It is one of the most common ways to trace the genealogy of a certain person. Family trees have a lot of potential to be explored for research purposes, especially medical family tree data. However, many family trees fail to properly encode all necessary and useful information. Genogram therefore seems to be the most suitable visual representation of medical family tree data as it provides an overview and allows one to comprehensively and clearly diagram the general and complex information of their family for several generations. However, some limitations exist while using genogram, namely problems in visualizing the wealth and complexity of the information represented once a family tree gets bigger and more complex. Hence, techniques and tools for exploring medical family tree data are proposed. By using genogram as a tool and several visualization techniques as an enhancement, it allows users to maximise usage of data by exploring the data from several different viewpoints. This framework follows the design of advanced graphical user interface guide which is the Visual Information-Seeking Mantra "Overview first, zoom and filter, then details-on demand", proposed by Shneiderman in 1996. Using t his framework, it is also possible to predict health risk factors based on medical family tree data. This framework can be utilized for personal use or by healthcare professionals.

Personality Detection in Online Social Networking by Using Three Factor Personality Model

Saravanan Sagadevan

Abstract

Personality as one of the human product mirrors the attitudes, behaviors and thoughts of each human. In the past, the questionnaire base survey became a fundamental tool in identifying the personality of the people. Language as a foundation to utterance and writing plays significant roles in representing the personality of people. The current proliferation of social networks especially Facebook that facilitates the virtual conversation paved ways to detect the personality of people by using various attributes such as networks density, distribution of numbers of "Likes" and text messages. The emergence of "big data" phenomena raises curiosity on detecting the personality of Facebook users by using thousands of status messages. Most of the past research papers on automatic personality detection in social networks applied Big 5 Personality Model and other pers onality characters such as angry, disgusting, and happy as base references for personality identification. Those papers also applied numerous machine learning, data and text mining techniques in order to explore the automatic personality detection in social networks. Instead of using Big 5 Model, this paper will use Three Factor personality Model to detect the personality of users by exploiting the Unigram method. Several machine learning and statistical techniques will be evaluate to derive accuracy of personality classification.

Ubiquitous Hajj Learning and Training System based on Hybrid Learning Design utilizing Blended Learning Technique

Rayan Yousif Yacob Alkhayat

Abstract

Hajj is the fifth and the last pillar of Islam; it is obligatory for every Muslim sane adult able to travel to Makkah to perform the rituals that begin on the eighth day of the month of Dhu al-Hijjah of the Islamic lunar calendar and last for five days after. Hajj procedures are considered complex, even many educational classes are given to pilgrims in most of Islamic countries, as well as in some regions where Muslims lives in, pilgrims face many challenges while being in foreign place and encounter sudden events that may affect their rituals performing and make their Hajj not completed or void. There are certain mistakes could spoil the pilgrimage knowingly or unknowingly; therefore, pilgrims should be alerted in advance. That's where some of the mistakes related to the spiritual side of education for the pilgrim, other mistakes may be committed as a result of the shock or surprise when getting to a place different from the pilgrim origin home environment, pilgrim may do mistakes accordingly of influencing by dispositions of other individual or collective pilgrims, as well as there may be misconceptions that pilgrim may adopt when conducted the ritual of this worship. Mistakes in Hajj may summarized as (1) Mistakes related to worshiping. (2) Behaviour mistakes conducted by individual pilgrims in the Hajj season with other pilgrims. (3) Even to pilgrims who have been trained or attend lessons about Hajj performing and aspect, there still mistakes related to the knowledge and informational side of the pilgrims, as the memory may experience gaps or omissions. And (4) Certain matters that might occur during the pilgrimage season where pilgrims have no prior knowledge about the style of dealing with them. As a conclusion , for getting maximum effectiveness of performing Hajj worshipping the pilgrims should (1) Learn well about the Hajj worshiping and its potential mistakes or cases that might occurred , recover them if possible. (2) Prepare to deal with some environmental or human-related factors which result in unacceptable actions in their personal behaviours. (3) Reinforce their accumulated learning. (4) Do their rituals with well understanding about the purpose and meaning of these rituals. The main objectives of this research are to (1) Design and effective learning model for Hajj training and education based on blended learning model. (2) Enhance individual actions in terms of dealing with others, concern for the Islamic brotherhood and maintain the general cleanliness of the pilgrimage environment. (3) Design ubiquitous learning system for Hajj training and education able to trace pilgrims movements and monitoring their rituals progress. The research consist of four main phases namely classifying mistakes committed by pilgrims and possible ways to overcome them, producing a hybrid learning style by Synth persuasive and assistance learning technologies with some Islamic learning ways and , prepare the pedagogy and its learning materials, and finally apply and evaluate the proposed work. Blended learning materials will be used for pedagogy creation within ubiquitous learning environment . In this study the experiment will be conduct on sample of individuals different in their ages and learning attainment. The prototype system wil l be built to be accessed from any PC or handheld device with network supporting. Tools such as SPSS also will be used for analysing pre-test and post-test of the proposed approach implementation.

Research Review

Track: Enabling Technologies and Infrastructures

Analysis and Design of Improved Chaotic Cryptographic Primitives based on Complexity and Period Length Perspective

Amir Akhavan

Abstract

During the past few years there has been a considerable research on the application of chaotic systems in cryptography. Chaotic systems possess profound characteristics such as determinism, ergodicity, random-like behaviour, nonlinearity, aperiodicity, high entropy, balance, nondegeneracy, incredibly low correlation of information, and extreme sensitivity to very small changes of the initial condition and control parameters. These characteristics are very favorable for cryptography and make deterministic chaos an interesting candidate for design of cryptographic primitives. Although, many chaos based cryptographic primitives have been proposed in the past few years, but a vast portion of them have encountered drawbacks such as security flaws, shortened key space, low speed and efficiency, lack of robustness. In this research, the drawbacks, which are originated from chaotic systems applied in the chaos based cryptosystems, are itemized and studied. Thus, initial conditions, control parameters and trajectories of the chaotic systems used in the chaos based cryptography algorithms are analyzed. The results of this investigation, provides evidence about behaviour of the chaotic maps. Both conventional cryptography and chaos based cryptography are in favor of maximum possible entropy and complexity. In this research, frequently used chaotic systems such as one dimensional chaotic maps, two dimensional maps and three dimensional chaotic maps (3D chaotic map) are investigated and their chaotic characteristics during computer realization are compared. The results of this investigation, provide primary information about the strange attractors, chaotic range of control parameters and their sensitivity to minor changes, while applied in different finite precisions. Based on the preliminary analysis of the chaotic regime of the control parameters (using Lyapunov exponent and bifurcation diagram) and behaviour of the chaotic maps, while iterated in different precisions, are investigated. Accordingly, new chaos based cryptographic algorithms such as hash function, image encryption, and random number generator are proposed. The proposed algorithms, are implemented and security of the presented algorithms are studied using different types of attacks. Similarly, their speed, efficiency and computational costs are compared with the existing chaotic and conventional cryptographic primitives such as AES, SHA1, SHA2, MD5 and linear feedback shift random number generators. Each of the proposed algorithms aim to improve security, speed and flexibility of the chaos based cryptographic primitives using different methods, such as: applying of *higher dimension chaotic systems*, *mixing two or more chaotic systems* to increase the size of the key space and avoid whirlpool around strange attractors and finally *higher precision of realization* to reduce the implementation adverse effects caused by unwanted amalgamation of trajectories.

One of the most important issues in the design of chaos based cryptosystems is the dynamical degradation of the chaotic maps, which has led to cryptanalysis and failure of many of the chaos based cryptosystems from the emergence of this field until now. In the first stage of this research, different classes of chaotic maps are analyzed using complexity analysis, Lyapunov exponent, bifurcation diagram and other available randomness tests to find the origin and causes of the short cycles and periodic behaviour of the chaotic maps. According to the results of these analysis three strategies are suggested to improve the chaos based cryptosystems. The suggested methods are used to design new chaos based cryptographic algorithms such as hash functions, image encryption algorithms and pseudo random number generators. The newly proposed algorithms are tested and their results are discussed to identify the best choices, based on the performance and security analysis of the algorithms.
and AOMDV.

Poster

Patients Profile Analytics for Predicting Rehabilitation Readmission on Malaysian Drug Addicts using Hybrid Data Mining Techniques

Amirah Binti Mohamed Shahiri

Abstract

Starting in year 1983, Malaysian Government has declared the drug addiction is the most dangerous threat to the national security. Regarding on National Antidrug Agency's statistic, from year 2009 until year 2013 around 67,451 people involved in drug addiction. A total of 61.32% are new drug addicts, while about 38.68% are relapse. Based on the statistic, it shows the method used today still do not effectively address the problem of drug addicts' readmission to the rehabilitation center. There are many drawbacks of the method u sed at present. Studies show that the technique used is not accurate and totally dependent upon the health records under the supervision of medical officer. Therefore, patient profile analytic is introduced to help reduce the reinstatement addicts to the treatment centers. This research is proposed to introduce a big data analytics,namely patients profile data for patient behavioural prediction. The study will identify the patients profile attributes by using reduction algorithm. These finding will be analysed by data mining techniques in order to reduce the rehabilitation centers' readmissions. The data mining method will be implemented and designed for behavioural prediction system. This study will contribute to develop a new behavioural prediction algorithm to determine the accuracy of the propose algorithm. The evaluation process is important to ensure the proposed framework is useful for future re search in big data analytics.

Enhanced Intelligent Water Drops Algorithms and their Applications to Optimization Problems

Basem O. F. Alijla

Abstract

The Intelligent Water Drop (IWD) algorithm is a recent natural-inspired stochastic swarm-based model that is useful for undertaking optimization problems. It imitates some of the natural phenomena of water flow in a river bed. Since its inception, the IWD algorithm has been successfully tailored to solve several discrete and continuous optimization problems. It is characterized by using a cooperative learning model to construct better solutions over consecutive generations and address exploration and exploitation issues pertaining to the search space. The main aim of this research is to enhance the IWD algorithm and overcome its limitations pertaining to local optimal, premature convergence, population diversity, as well as balanced exploration and exploitation in handling optimization problems. Firstly, instead of using the fitness proportionate selection method in the solution construction phas e of the original IWD algorithm, two ranking-based selection methods, i.e. linear ranking and exponential ranking, are proposed in this research. Both ranking-based selection methods of the modified-IWD algorithm aim to solve the identified limitations of the fitness proportionate selection method, and enable the original IWD algorithm to escape from local optima and avoid premature convergence. Secondly, a Master River and Multiple Creeks (MRMC) model is proposed for the modified-IWD algorithm. The resulting model, abbreviated as MRMC-IWD, comprises one master river (swarm) that cooperates with several independent creeks (sub-swarms) in an attempt to maintain a balanced exploitation and exploration search process for solving optimization problems. Each creek provides a partial solution to the master river in a sequential manner. The main benefits of MRMC-IWD include enhancing population diversity and preserving a bal anced exploration and exploitation search process of the modified IWD algorithm. In addition, MRMC-IWD is further enhanced with a local search algorithm, and the resulting model is called Hybrid-MRMC-IWD. To evaluate the usefulness of the enhanced IWD-based models, three combinatorial optimization problems, i.e., rough set feature subset selection (RSFS), MKP, and TSP problems, are considered. A series of experiments is conducted, and the results demonstrate that the proposed models i.e. modified-IWD, MRMC-IWD, and Hybrid-MRMC-IWD, are able to avoid local optimal and premature convergence as well as to enhance population diversity and preserve a balanced exploitation and exploration search process; therefore improving the performance of the original IWD algorithm.

Integrating the BCO framework with a pruning strategy based on frequent closed pattern

Cheah Siew Lee

Abstract

The current generic BCO framework integrates a local search mechanism but the local search is expensive. Due to the high overhead of the local search, a pruning strategy named Frequency Based Pruning Strategy (FBPS) is proposed in the current BCO framework. The FBPS is based on the occurrence frequency of the solution building blocks. However, the FBPS is sensitive to the number of elements in the building blocks. This research aims to propose a pruning strategy with frequent closed pattern analysis. To test the proposed pruning strategy with frequent closed pattern analysis, Combinatorial Optimization Problems (e.g. Traveling Salesman Problem, Quadratic Assignment Problem and Job Shop Scheduling) will be used as the testbed.

A bee colony optimization for scheduling problem with shifting bottleneck approach

Choo Wai Mun

Abstract

Scheduling plays an important role in industry and a good schedule is greatly influencing the performance of the system. An industry schedule concerns the allocation of resources and operations to task over time and to fulfil the objective of the schedule. Hence, it is often consider as a NP hard problem. Therefore, Job shop scheduling problem (JSSP) concept is widely adapt in industry to produce a better schedule. In previous research, application of meta heuristic algorithm and hybridization with local search is high. And in recent years, researcher has start to relate the bio inspired technic, such as ant colony optimization , neural network, particle swam intelligence and bee colony optimization in optimizing JSSP. And bee colony optimization has perform well in some of the job shop problem. Besides that, the implementation of shifting bottleneck heuristic can further improve the solution. Machines that yield the maximum make span is called as the bottleneck machine, re-optimization procedure will performed to re-sequence the other machines to obtain an optimum solution. Hence, the implementation in this research will be based on bee colony optimization with shifting bottleneck algorithm to optimize the job shop scheduling problem.

A Dynamic Fuzzy-Based Dances Mechanism in Bee Colony Optimization Algorithm

Choong Shin Siang

Abstract

A Bee Colony Optimization framework (BCO) proposed by Wong et al. is inspired by the bee foraging behaviour, where waggle dances are used as a communication medium among bees. The duration of waggle dances is determined by a linear function in the current model. This poster presents an improved BCO model with dynamic fuzzy-based mechanism to regulate the dance duration. This model will be tested on a set of TSP benchmark datasets.

Harmony Search based Hyper-Heuristic for Timetabling and Scheduling Problems

Khairul Bin Anwar

Abstract

This research is concerned with the investigation of hyper-heuristic methods. Hyper-heuristic is a new trend in optimization methods. In this method, a high level heuristic (or meta-heuristic) is used to select a heuristic from a set of low-level heuristics. Hyper-heuristic can be referred as "heuristic to choose heuristic" and this method actually tries to find the best heuristic to solve the optimization problem on hand. The main motivation of using hyper-heuristic is to produce a general method that can be used to solve different hard optimisation problems. In this works we proposed a new hyper-heuristic framework named as Harmony Search-based Hyper-heuristic (HSHH).The original idea was to apply a sequence of low-level heurist ics to a selected solution in order to produce good quality solutions to given problem. Therefore, we combine three main operator in harmony search algorithm: memory consideration, random consideration and pitch adjustment as a high level heuristic in order to select and generate a sequences of improvement low-level heuristics. To demonstrate the effectiveness of the method, we apply the proposed method to two different timetabling and scheduling problems, taken from the real world and our results are compared with those of other heuristic methods in the literature. Experimentally, the HSHH approach can achieve comparable results with other methods and in several instances, HSHH are able to produces competitive results with those obtained using other sophisticated method.

Reinforcement Learning based Brain Fiber Tracking Model

Khosrow Amiri Zadeh

Abstract

High computational time and lack of diffusion direction recognition remain major concerns in the fiber tracking problem. Since, a reliable fiber tracking may assist physicians to find complementary information of brain injury, this is necessary to employ an alternate technique with minimum response time as well as acceptable fiber tracking precision. In this paper an action-value-based technique inspired by the reinforcement learning approach is presented. The proposed fiber tracking model takes into account the information obtained from both local and global perspectives. The proposed model makes a set of optional "front orientations&r dquo; and takes a direction according to the ε-greedy policy. The greedy selection is applied based on a-posterior probability criterion. We present a sequential-orientation-selection task where after each selection a reward value from a reward generator function is received. Consequently, multiple fiber paths for each seed point are reconstructed. Finally, a path that maximizes the cumulative reward is selected. Performance of the proposed model is evaluated both on artificial data and in vivo.

Personalization of Tweets for Trending Topics

Lu Wei Lin

Abstract

Twitter as a popular social media platform, about 200 million tweets are being generated every day. On twitter, users can tweet about content topic during occurrence of evens. This results in trending topics in real time, such as MH370 as a trending topic. Meanwhile, within tens of thousands of tweets, some of tweets are valuable information, and some of tweets are useless information. Therefore, it is important to classify these tweets based on individual preference for better information retrieval.To address this problem, this paper focuses on automated personalization of thousands of tweets for popular trending topics. The main object is to classify the tweets information from twitter, where tweets are classified based on "Like" or "Dislike" on a particular topic. We use text classification to construct the category model for "Like" and "Dislike". Feature selection algorithm is used where candidate features are selected using N-gram, TFIDF, Natural Language Processing techniques. N-gram algorithm is used to generate the features, TFIDF is used to weight features appearance by frequency. Finally, we evaluate whether the constructed model is able to suggest t weets based on the user preference.

A Study of Emotional to Improve the Learning Performance Using Virtual Tutor Intelligent Agent

Najlaa Sadiq Binti Mokhtar

Abstract

Nowadays, with the advancement of the technology, internet becomes an important medium of the peoples around the world. In this modern worlds, online learning indirectly slowly changing the way of the people learn which is different from traditional education. Therefore, to improve communication and information sharing, e-learning has been widely used in education to enable students to learn without borders. However, to improve both instructional productivity and learning quality are major challenge in e-learning today. Besides, not only to generate good outcomes through e-learning, but also better engage students in the process of e-learning. Most of the e-learning system does not support user's understanding in learning courses. For example, the system does not provide the emotion diagnosis like stress or frustration, understand or not, and the degree of motivation either the users want to continue the learning process or not. Although arguably, there are a lot of e-learning websites that have been developed to support the online learning, but, most of these websites are lacks of emotional approach embedded in their learning activities where the websites do not support interactive learning by responding their behavior or emotion. As a result, the lack of the emotional intelligent agent embedded in the e-learning websites will limit the users' interaction and the discussion becomes passive and limited. In order to address this problem, we want to suggest a more interactive and attractive web-based learning system that will provide the emotional intelligent agent to learn the programming. The system will be embedded with the emotional intelligent agent in order to allow the students to learn actively in a virtual environment.

Supplier evaluation measurement : Criteria (feature) selection in Supplier Performance Measurement System

Nor Shafina Bt Shaharuddin

Abstract

Supplier evaluation is a key operational task for developing sustainable supply chain partnerships. Environmental, social, and economic dimensions must all be considered in order to evaluate a well-rounded sustainable supplier, one that can enhance supply chain performance. Part of the supplier selection process involves supplier evaluation together with selection, which is an important issue to supply chain and production and operation management. When organizations seek to develop or choose a supplier evaluation and selection method, the organizations specific requirements are introduced. Therefore, model flexibility and a choice from a range of different selection methods with different applications are needed. With this in order to obtain a systematic evaluation method, it is crucial to have a system built with the users' requirements that can achieve the goal of effectively, accurately and timeliness in evaluating the supplier. In order to obtain the goal mentioned above, it is important to ensure the criteria of evaluating the suppliers. Some of the criteria from the previous study were price, quality, delivery, warranty and after sale services and more. There were total of 30 criteria as mention in a paper by [2]. However this brought to another question, are all the 30 criteria is useful in order to evaluate the supplier to achieve the goal. Hence this research is intended to study the requirements for a systematic system in evaluating the supplier performance using manufacturing environment as the domain of the study. The study is expected to develop a requirement analysis of the system which will include important criteria which is significantly contribute in resulting the supplier evaluation process. The requirement will be used for future system development for SEP.

Test Analytic Framework to Support Test Managers in Making Decisions

Nur Hafizah Binti Haron

Abstract

Software testing is an essential activity in software development process that has been widely used as an indicator of software reliability and quality. Software managers rely on software test result analysis to decide that the software under test has fulfilled customer's specification and can be released. We are proposing a framework, Test Analytic Framework that will help software managers to make informed decision during software testing development phase. Our proposed framework will use two important information from test data: test coverage and number of defects. These information will be analysed and the result will be presented in a meaningful representation for supporting managers in making informed decision during software testing development phase.

Flash Cache Management Policy for Large-scale Video-on-Demand Hybrid Storage Server

Ola Ahmed Mohammed Al-Wesabi

Abstract

Large-scale video-on-demand (VoD) services use hard disk drives (HDDs) to store large video files. VoD performance is limited by relatively lower access bandwidth and higher access latency of HDD. These limitations increase dramatically when a VoD server receives a large number of simultaneous requests. On the other hand, flash-based solid-state drives (SSDs) are an attractive alternative because they ensure faster access for an intensive reading system such as VoD. Unfortunately, replacing the entire HDD with SSD is costly because of its high cost per gigabyte. Therefore, hybrid HDD storage and the small capacity of a flash-based SSD can provide high but cost-effective performance to the storage subsystem of a VoD server. The main goal is to improve the performance of the VoD server by maximizing the number of concurrent user requests and minimizing st artup latency in a cost-effective way. A flash-based SSD stores only popular videos to provide fast access for read-intensive workloads. This study proposed a flash cache management (FCM) scheme that uses a flash-based SSD as non-volatile device. FCM controls access of multiple requests for the same video file, thereby reducing multiple buffering for the same data. Experimental results show that the hybrid HDD storage with flash-based SSD provide better performance than HDD-based system which reduce the average response time for a large-scale video-on-demand storage server by about 77.44%.

Modelling of Realistic Emergency Evacuation Dynamics of High Density Crowds during Hajj

Osama Nasif Ahmad

Abstract

The simulation of reliable evacuation dynamics and behaviors exhibited by crowds is still a challenge for the computer simulation community. This challenge stems from the lack of evacuation models that are capable of realistically reproduce pedestrian evacuation dynamics in high density scenarios. This research investigates the best-suited modeling approaches for simulating a realistic egress of large and dense crowds in the emergency situation. Physics-inspired approaches are adapted and extended to model the dynamics of pedestrians. The framework presented in this research comprises two levels of details, macroscopic and microscopic interacting with each other. First, local motions are modeled such as pushing, falling and becoming an obstacle with some characteristics related to the HAJJ environment are taken into account such as the impact of culture on the movements. Second, a global navigation met hod is developed for the exit selection and way finding behavior. In order for achieving a realistic evacuation simulation, the model has to describe the emergent and collective phenomena of panicking crowds especially those observed at the bottlenecks such as clogging and stop-and-go waves. The resulting models are applied to a part of Al-Masjid Al-Haram in Makkah to assess the current layout especially the efficiency of the design at the bottlenecks.

An Acceptance of Mobile Learning for Children in Primary Schools in Egypt

Reham Adel Ali Abdelwahed

Abstract

In recent years, educational technologies and computer programs have been developed in different ways, especially in regards to children's education. It is well known that childhood are the time for brain development and shaping during which humans can learn more quickly than at any other time in their life. Also, at this age they can learn a lot while playing. The acceptance of mobile learning by children and educators is critical to the successful implementation of mobile learning systems therefore it is important to understand the factors that affect children intentions to use mobile learning. In recently, many researchers have focused on m-Learning and its environment. The adoption of mobile device is not the same in all countries. Therefore, the researchers should explore this case by case in a specific country.

Opinion Summarization using Multi Criteria Decision Making (MCDM)

Saif Addeen Ahmad Ali Alrababah

Abstract

Recently, tracking online opinions and monitoring them are considered as a big issue for many communities, like business community to extract the customer feedback which indeed contributes in enhancing the provided products and services. On the other hand, summarizing these opinions is important for the customers as well which is mainly affects on their buying intention for instance. But analyzing and monitoring these opinions is a dreadful task because the diversity of the social Web sites and the huge amount of opinions published in each site. In this research, we explicitly concentrate on quantitative summarization of customer reviews based on customer profile using Multi Criteria Decision Making (MCDM) to evaluate the provided services and products, and we primarily focused on aspec t-level summarization to build a well-organized model with temporal visualization.

Medical Tourism on Mobile Application in Thailand

Sareeya Ben-Arlee

Abstract

Recently, the combination of medical tourism and tourism for leisure has become a trend. Medical tourism refers to a vacation that involves traveling across international borders to obtain a broad range of medical services. It usually includes leisure, fun, and relaxation activities, as well as wellness and health-care services. Patients who seek to reduce their health-care expenditures travel to medical centers in other countries to obtain dental, medical, and surgical services that are less expensive than those offered in their home countries. Thailand is one of the countries in which medical tourism is growing most rapidly. Thailand attracts medical tourists because it offers high quality and readily accessible medical services at affordable rates, while enabling patients to combine treatment with vacationing. However, medical tourists struggle to organize their medical and holiday plans easily. The people who want to travel for health care do not have access to the doctors' schedules so it is challenging for them to organize their holiday accordingly. In addition, most hospitals in Thailand are not located in locations that typically attract tourists. Because they are not in central locations, it is difficult for tourists to be knowledgeable about what they can visit throughout their stay in Thailand. Therefore, our research has focused on identifying components of medical tourism, and designing a mobile application to support medical tourism stakeholders in Thailand. It is expected that the application enables medical tourists to see when doctors are available, book their appointments, and easily plan a vacation around their medical needs. An extensive literature review will be done and existing mobile applications and websites will be examined.

CALM: An Architecture for Context Aware Semantic Dashboards by Harnessing Linked Open Data Cloud on Streamlined Web Mining Data

Thineswaran A/L Gunasegaran

Abstract

Information overload continues to haunt typical Web users and the problem seems to be getting from bad to worse with every passing day. The proliferation of Web 2.0 and its seemingly uncontrolled growth has only helped to aggravate the problem further. From a user modeling perspective, this problem can only be solved with proper understanding of users' interests and preferences with respect to their interactions on the Web. Therefore, this research focuses on identifying context specific information about user interests and preferences by augmenting streamlined Web mining data with semantics from Linked Open Data cloud data sets. These data will be used to proactively capture and deliver information deemed important according to users' current context in the form of semantic dashboards.

Enhanced Methods for Recognition and Identification of Fish Swimming Patterns

Wong Poh Lee

Abstract

The tracking of multiple fish using computational methods has become a research endeavour among researchers. The tracking of fish is important as the information displayed by the fish such as trajectory patterns, location and colour provide a hypothesis to whether the fish are healthy or stress. The problems faced currently are fish tracking method is not accurate where thresholds such as bubbles and some lighted areas are identified as fish. The detection and identification rate of existing systems are still improvable for recognizing fish. A technique is required to identify the fish swimming patterns such as swimming curves and speed to further study the changes in fish behaviour. Besides, the detection and identification rate is low especially in a real-time environment. In order to overcome the problems, an enhanced method for image filtering and water clearing process is designed and developed. A more accurate fish tracking method is proposed as well as an intelligent method to identify and to detect fish swimming patterns. By accomplishing the above methods, an optimisation is carried out for better detection and recognition rate. In this research, existing tracking algorithm consisting of motion detection algorithm and particle filter algorithm is further improved. In the initial stage, a dynamic cropping of the fishes is proposed to extract the information of each fish. The dynamic cropping of the fish images depends on the object tracking algorithm which provides information such as the trajectory patterns and the location of the fish from the start of the video frame. Then, a feature detection and recognition technique is applied. Finally, a feature matching method is used to match the feature vectors within the cropped image and the video frames. Therefore, a scheme consisting of an object tracking algorithm and colour object recognition technique to detect the fish in the viewing field is propos ed. The required objects to be recognized in this research are the fishes. An enhanced method that utilizes existing object tracking algorithm and feature descriptors for fish recognition is proposed. In this study, the fish recognition, based on GCFD (Generalized Colour Fourier Descriptor) is introduced. The GCFD is further enhanced to enable every fish to be identified accurately. GCFD is used as the main descriptor to extract the features of the fish as it is invariant to rotation and translation. Koi fishes are chosen in this study due to their active swimming behaviour, variety of colours and easy-to-adapt habitat in the water. A real-time prototype system which models the fish swimming pattern consisting of the enhanced algorithm is developed to evaluate the results obtained from study. In comparison with other feature descriptors, fish recognition based on GCFD provide an improvement of 5.16% in comparison with other existing feature descriptors using the same preprocessing. This provides a benchmark for future research to be carried out based on newer feature descriptors mainly in the domain of object tracking, recognition and identification.

Distributing Node Density In Mobile Adhoc Network (MANET) To MANET Gateways

Primantara Hari Trisnawan

Abstract

Internet provides services to its users. In combination with MANET, it causes high Internet access from MANET to Internet via MANET gateways. The number of mobile nodes (MN) in a specific MANET domain creates MANET node density. However, node density may not distribute uniformly among MANET gateways. Existing approaches focus on a MN with a gateway random selection, a nearest gateway selection, a low load gateway selection or a gateway selection based on combination of a low load, distance and communication quality. Most approaches employ reactive MANET routing protocol. Even though for the long observation, the average load among gateways may balance, these approaches can cause congestion or unbalanced load among available gateways on a small period of observation, such as between two advertisements of the gateway's condition. By considering almost all MNs intend to conn ect to Internet, the "swing" load effect occurs among gateways in this small duration. It also causes a non optimal load and low quality of service (QoS) among gateways any time. We propose solution to this problem by fairly distributing node density to each gateway on this MANET domain such that Internet traffic path of a MN will only pass through the pointed gateway. The approaches are addressed to how a MN selects its "gateway", what algorithm is used to fairly distribute node to each gateway, what network topology is applied, and what routing protocol is suitable to support this goal. These approaches implement a network topology in a specific network domain with two kinds of gateways; Internal Gateways are connected to MANET and External Gateways are connected to Internet. Both kinds of gateways are wired two-tier connection using a designed protocol. An algorithm as Breadth First Search (BFS) is employed by each Internal Gateway to handle its managed MN s.. A proactive MANET routing protocol is considered and enhanced with additional messages resulted from the algorithm. From routing information, each gateway will fairly handle some nodes only. Each node will receive Internal Gateways' advertisement about to which gateway it has to connect for sending Internet traffic. Using this method, it will be known that Internet path of all nodes will be distributed fairly across Internal Gateways. If most of MANET nodes have same possibility to access Internet, then load balance of gateways are likely to be reached.

GPGPU: Acceleration of the Phylogenetic Tree Construction

Najihah binti Ibrahim

Abstract

The tremendous growth of new genomic data, the enhancement of analysis methods and the innovations of new technology become the main interest of this research. This research focuses on the construction of phylogenetic tree, which is one of the genetic sequence analysis scopes. The whole procedures of this analysis have become the rigorous standard for decades. Sequence alignment is the foremost operation of the procedures, before continuing to the last stage which is the phylogenetic tree construction process. Due to the large number of sequence alignment's programs that are available nowadays, the selection of a good sequences alignment method become more difficult. Some preliminary experiments were conducted which involved the process of comparing a few notable MSA programs such as ClustalW, Kalign, MAFFT, MUS CLE and T-Coffee, using standard homology sequences dataset. MAFFT was chosen as the best sequence alignment program to be applied in the primary phase in order to proceed for phylogenetic tree construction. The results of these experiments were aligned sequences. To determine the best reference of the phylogenetic tree construction program, some preliminary experiments were conducted that involved the process of comparing a few notable phylogenetic tree construction programs such as GARLI, MrBayes, Tree Puzzle and FastTree, using the aligned sequences from MAFFT program. FastTree was selected and this program is compiled under the heuristic techniques and performs the profile-based methods for the arrangement of tree nodes and taxas position. Through the experiments, we found that, best aligned sequences selection can affect the phylogenetic tree construction process and result. FastTree construction program is not only focused on algorithm and acceleration enhancement, but, a ctively focused on the enhancement of maximum-likelihood of the phylogenetic tree. As taking the FastTree as an adaptation, some experiments were conducted to find the solutions of the tree's accuracy, tree's construction speed and performance, and time consumption to complete the whole construction process of a tree. As a result, a phylogenetic tree program was developed and improved by implementing the serial program algorithm enhancement and acceleration enhancement via the implementation of many-core processors, Graphics Processing Units (GPU). At the end of this research, we got the accurate phylogenetic tree while experiencing the fastest speed and lower time consumption of construction process.

Image-based Information Hiding Scheme using Diamond Encoding

Samer Hassan Suleiman Atawneh

Abstract

This paper presents a new information-hiding scheme based on diamond encoding. The DE conveys large payload, while maintaining the image quality, by embedding secret digits using larger notational system. However, DE does not support the embedding of differently based digits. The proposed scheme provides the advantage of producing stego-images have lower distortion than DE by embedding different-bases digits into the cover image. The proposed algorithm divides the secret information into two parts and embeds each paper into the cover image using a different base. Experimental results show that the proposed scheme has better embedding efficiency compared with other techniques. Moreover, the proposed scheme is robust against steganalysis attacks such as RS-steganalysis.

Affective Computing

Zaaba Bin Ahmad

Abstract

In recent years, social media has become universal and important for social networking and content sharing. The content that is generated from these social sites remains largely untapped. In this work, we demonstrate how social media behavior can be used to predict user personality traits. We extract social media behaviors from features like comment rate, "like" rate and comment linguistic features to predict the users personality traits. User will be given a topic to be discussed and then all the features and rate will be collected and analyzed to predict user personality traits of introverts or extrovertness. The topic of Sustainability and Green Awareness is chosen as we will try to associate that personality trait can be link with important global issues, the experiment result will then can be associated with recommenders system or agent based system in modeling a better strategy of Green or Sustainability Initiative towards user with different personality traits.

Improving IPv6 Neighbor Discovery Security using Trust-ND

Supriyanto

Abstract

This research introduces Trust-ND to improve the limitation of Secure Neighbor Discovery (SeND) implementation. It could reduce the complexity of SeND by implementing the concept of distributed trust management.

H.264 Tiling: A New Parallel and Quality-Aware Approach for Parallelizing H.264 Codec

Mohammed F. Eessa

Abstract

Decoupling of algorithmic design from the target architecture has shown several issue in parallel video coding approaches. To eliminate these issues, a new level of parallelism for the H.264/AVC encoder is proposed in this work. The idea is to decompose the video frame into rectangular shapes (tiles) for simultaneous encoding via utilizing a newly proposed natively- parallel 2D domain decomposition algorithm which consider the target architecture during the design phase of the algorithm.

Improving Reliability and Security in IPv6 Duplicate Address Detection Mechanism

Shafiq Ul Rehman Hakeem

Abstract

Duplicate Address Detection (DAD) process is performed by every node on link in an IPv6 network before configuring any address to ensure the address is unique on link when IPv6 Stateless Address Autoconfiguration (SLAAC) is enabled. However, the DAD mechanism is unreliable and vulnerable to security threats such as DoS attacks. We attempts to propose a secured DAD mechanism which will encounter DoS attacks while maintain its lightweight overhead and flexibility of address generation.

A Framework to Mitigate Botnet-based Hypertext Transfer Protocol Flooding Attacks on Web Servers

Esraa Saleh Hasoon

Abstract

One of the most insidious cyber threats for security community is represented by diffusion of botnets. A botnet could be used to conduct a cyber-attacks, such as a DDoS, against a target or to conduct a cyber-espionage campaign to steal sensitive information. Current attacks such as Botnets are prevailing mechanisms for the facilitation of the distributed denial of service (DDoS) attacks on computer networks or applications. Currently, botnet-based DDoS attacks on the application layer are latest and most problematic trends in network security threats. Among all the types of the Botnet-based application layer attacks, considered H TTP GET flooding that initiated by Botnet, considered the HTTP GET flooding attacks that targeting the Web servers is the most dangerous type. As a result, protecting the infrastructure services such as (Web servers) from such attacks has become a critical issue that needs to be urgently addressed. Unfortunately, with the existing detection and mitigation mechanisms such as Intrusion detection systems (IDS), intrusion prevention systems (IPS), and firewalls are the current mechanisms that cannot detect the HTTP GET flooding attacks that imitated by Botnets with different behaviors on web servers. However, because these policies depended on signature-based techniques and anomaly-based techniques, they are ineffective in detecting HTTP-GET flooding attacks. Therefore, these policies built to protect against known attacks instead of polymorphic behavior attacks. The intent of this thesi s is to build a framework to mitigate Botnet-based HTTP GET flooding attacks on Apache Web servers by using behavioral features-based method. the proposed framework was tested on different datasets were generated by Botnet emulator and National Advanced IPv6 Centre (NAv6) environment such as HTTP Based Botnet (HBB) Dataset. We conduct four experiments to evaluate our proposed framework. In the first experiment was used the simulated traffic generated by BoNeSi DDoS simulator. the HBB NAv6 Dataset corpus is used as the benchmark dataset with normal traffic for second experiment. The third experiment is used the same Dataset in terms of Botnet or malicious traffic. The fourth experiment is used NAv6 HBB dataset with collection of normal and Botnet traffic. Throughout this research we expect that our proposed framework is able to detect an HTTP GET flooding attacks against Web servers more accurate and mitigate the detected IP addresses un der periodically monitoring framework.

An Intelligent Framework for ICMP Flooding Attack Detection in IPv6 Network Based on Artificial Neural Network

Redhwan Mohammed Ahmed Saad

Abstract

The new internet protocol IPv6 is designed to replace the old internet protocol IPv4. Having the IPv4 address depleted on February 2011, the future of the computer networks and the internet depended on IPv6. The network security is increasingly becoming an important issue. As with any new technology, the initial stages of IPv6 implementation are obligatory to be exploited by cybercriminals. One of important protocols in IPv6 implementation is ICMPv6 which is used on neighbor and router discovery. However, this protocol also could be used by an attacker to deny network services such as ICMPv6 flood attacks that decreases the network performance.

Analytical Modelling of Connectivity of Inter-Vehicular Communications in Fading Channels

Sabri Mohammed Abdhood Hanshi

Abstract

High dynamicity and characteristics of vehicular ad-hoc environment make the connectivity one of the most important issues in vehicular networks to ensure data delivery and enhance the performance of upper layer communication protocols. The effects of Channel randomness caused by fading should be taken into account in connectivity analytical model. Nakagami-m fading channel with superimposed shadowing mathematical model is employed to represent the effect of channel randomness. In this research, inter-vehicle distance model is designed and analytical model of the distance connectivity and platoon size of cluster. The analytical results show that the designed model can represent wide range of fading channel and take into account the effect of shadowing.

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