



CSPC 2013

Graduate On Time

**The 10th Computer Science
Postgraduate Colloquium
2013
27 – 28 August 2013
KOMPLEKS EUREKA, USM**

Organized by:



UNIVERSITI SAINS MALAYSIA

School of Computer Sciences

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Foreword

Foreword from the Dean of the School of Computer Sciences

Professor Dr. AhamadTajudinKhader

Dean

*School of Computer Sciences
UniversitiSains Malaysia*



First of all, I would like to extend my heartiest gratitude to the organizing committee in sustaining the Computer Science Postgraduate Colloquium throughout these years. Since the year 2004, the Computer Science Postgraduate Colloquium has been the annual meeting ground for our postgraduates to showcase their research findings and share research ideas as well as socialize with fellow students and lecturers.

This year, under the theme of Graduate on Time (GOT), we hope this colloquium will encourage and facilitate our postgraduate students into timely graduation. The main essence of the theme highlights the importance of having a timely completion of studies. Each of postgraduate students that successfully graduate on time contributes to the increase of the school's research performance index, and also saving student's time and cost of prolonging their postgraduate journey.

Both lecturers and student need to collaborate to ensure timely graduation. Time management is one of the key towards graduating on time. Students should plan and accomplish milestones in order to increase quality publication. Self-discipline is also another key essential in order to graduate on time. Students should motivate themselves with positive attitude in spite of negative emotional states. When things happen beyond the control of the supervisor and student, such as changing supervisor or department, or etc., students should get back on track as soon as possible with a positive attitude. A series of guides and services has been provided for postgraduate students to manage their studies, as well as enforcement on frequent meet up with the supervisor to ensure they graduate on time. Also, the new incentive scheme has been introduced to incentivise supervisor in encouraging student to graduate on time.

Therefore, with the theme of promoting Graduate on Time, it is hoped that this colloquium will bring more benefit and confidence to our postgraduate students in developing and completing their research work within the standard time frame. It's not the destination, but the journey that matters most. Joy is found not in finishing an activity but in doing it. I wish you all the best and enjoy in your postgraduate research journey.

Thank you.

Foreword

Foreword from the Chairman of CSPC 2013

Associate Professor Dr. Putra Sumari
Chairman
Computer Science Postgraduate Colloquium
2013



“Success is the sum of small efforts repeated day in and day out.” Robert Collier (1885 – 1950)

It is a great pleasure to introduce the 10th Computer Science Postgraduate Colloquium (CSPC'13) of the School of Computer Sciences, Universiti Sains Malaysia (USM). The central theme for this year's colloquium; "Graduate on Time (GOT)", is aiming to promote and equip our postgraduate students with the best practices and strategies of GOT as well as strengthening the quality of research.

It is crucial for our graduate students to have the Graduate on Time mindset throughout their study duration, so that their research directions are strategized and geared towards a well-targeted goal. Punctuality, quality and recognition are essential factors contributing to the individual, the school, as well as the university's performance. By promoting the Graduate on Time mindset, we are not simply hoping for quality theses produced within the ideal candidature time, but students should also be able to strike a balance between their research and personal life wisely. Graduate students are expected to develop their networking by publishing and communicating their work in conferences and journals. Such approach ensures that the student's ongoing research is abreast with the latest technology advancement related to their areas.

Doing a research degree is not simply about obtaining another degree. It resembles more of a long journey through life and knowledge rather than the standard semester by semester progress. In order to achieve success, it requires perseverance, hardworking and determination qualities, to name a few. We are hoping that students can view the Graduate on Time mindset as a key motivator to keep everything on track and keeping everything closely together. On behalf of the organizer, we would like to welcome you to the 10th Computer Science Postgraduate Colloquium 2013 and hope that you will receive the utmost benefits from attending this colloquium. I would like to take the opportunity to say a big thank you to the committees who had worked hard to make this conference a success. A successful conference is the sum of many important parts from committee and the participants.

Thank you very much.

About CSPC 2013

THEME

Graduate on Time (GOT)

OBJECTIVES

- To promote research culture of GOT
- To equip postgraduate students with best practices and strategies of GOT
- To provide a platform for research students to present research work
- To raise social and academic cohesion amongst CS postgraduate research students

The theme of Graduate on Time (GOT) is employed for this year's Computer Science Postgraduate Colloquium 2013 (CSPC 2013). A timely graduation could mean graduate within 42 month from the date of registration as a Ph.D. student. The main essence of the theme highlights the importance of having a timely completion of postgraduate studies. Graduate on time are very important to ensure a smooth transition to a successful career in research, as on-time graduation signals that the researcher personality is organized, focused, responsible, and meets deadlines. Graduate on time bring win-win situation for both school and students, as each student that graduate on time not only brings increment on school's performance index, also saving their school fees for prolonging their studies.

In parallel with the theme of GOT, the objectives of CSPC 2013 promote research culture of GOT among our postgraduate student. Also, to equip our postgraduate students with best practices and strategies of GOT. This colloquium provides a platform for our researcher students to present their research work. Furthermore, we aim to raise social and academic cohesion among our CSpostgraduate research student.

VENUE

This year's colloquium is held in Kompleks€UREKA, UniversitiSains Malaysia. The strategic location of Kompleks€UREKA, within the UniversitiSains Malaysia campus ensures a convenient, easy access venue, yet with world class facilities. Kompleks€UREKA has hosted many spectacular events, conferences, seminars that leaves guests with memorable experiences. The premise is located adjacent to the southern entrance on Jalan Sungai Dua, Penang, with over 200 parking bays within the grounds of the building.

The venue has a theatre styled auditorium and several conference rooms which are well equipped with PA and multimedia systems which are suitable for keynote talks, meetings and presentations. On the other hand, its opened- concept exhibition lobby provides an ambience and conducive environment for researchers and students to exchange knowledge, ideas and socializing.



Keynote Speaker

Factors Associated with Graduate Students Degrees Progress and Models on the Completion of Graduate Degree on Time

Professor Dr. JuhanaSalim

*Faculty of Information Science and Technology
UniversitiKebangsaan Malaysia*



Brief Biography

Professor Dr. JuhanaSalim is a Professor in Knowledge Technology, Faculty of Information Science and Technology (FTSM), UniversitiKebangsaan Malaysia (UKM). Currently, she is the Deputy Director at the Centre of Collaborative Innovation of UKM. She was formally the Head of the Information Science Department (2008-2001) FTSM and the Head of the Strategic Information System Research Group in UKM. She obtained Bachelor in Library Science from Mara Institute of Technology in 1978, Bachelor in Arts (Sociology) in June 1981 and Master of Science in Librarianship in April 1982 from Western Michigan University, Kalamazoo, USA. She received the Doctorate of Philosophy (Information Science) from UKM in July 2000. Her research areas are: Information skills, Information Organization and Knowledge Management. Her research output includes Holistic Knowledge Management System, Smart Information Centre System, Gateway to Digital Libraries and Searchable Databases, Business Knowledge Engineering System and Web Resource Extraction System and chemical Inventory management System. All of these products were exhibited at the National and International research expositions including ITEX, Salon International Des Inventions Geneva and Brussels Innova. She received 7 gold, 5 silver and 5 bronze awards at the research expositions she participated. Two of her inventions received Gold and special awards for: Best IT Inventions Award (2004) and Best Invention at the International Islamic Innovation Award (2009). In December 2012, she received the Order of Merit for Academic Invention at the World Inventor Award Festival in Seoul, Korea.

Keynote Abstract

This keynote focuses on graduate student attrition, the needs of graduate students, roles and responsibilities of students and supervisor, the length of time taken to complete graduate degree and the various factors affecting time taken to complete graduate degree. The findings from studies conducted on factors associated with graduate student degree progress and on the reasons why some students were not able to complete on time will be highlighted. For the interest of computing educators, this keynote address would include several concerns particularly about the wished-for approaches and support for thesis work that seem necessary from the student point-of view. These include the highlighted need for expert advice, learning and personality styles, time management

The 3Cs in Research leading to a PhD: Contribution, Context and Communication

Professor Dr. MandavaRajeswari
School of Computer Sciences
UniversitiSains Malaysia



Brief Biography

MandavaRajeswari is currently a Professor at the School of Computer Science, UniversitiSains Malaysia (USM). Among her area of expertise includes Machine Vision, Semantic Image Analysis and Medical Image Analysis. At the moment, she is the Head of the Computer Vision Research Group and leads a large group of researchers in developing IT solutions and algorithms for computer assisted diagnosis related to medical images. The group's recent work in medical image analysis such as ENDEAVOR and Brain White Matter Lesion quantification (WML), are recognized as the top two solutions by the Medical Image Computing and Computer Assisted Interventions (MICCAI) Society. Professor Mandava is also working on developing a neuroimaging method with specific focus on Diffusion based imaging and fMRI. The primary objective of this new research is to extract the brain white matter fiber tracts and neuronetworks.

Keynote Abstract

Understanding what may be a possible contribution to the knowledge, contexting one's own work in the body of literature are common issues faced by many PhD students. These have been addressed by many authors and literature is abundant on them. Several aspects of communication in the form of reports, conference papers or journal papers have also been dealt with in detail. One of the most important aspect of a PhD work is the communication between the PhD candidate and the thesis supervisor. This talk while discussing the generic aspects of the 3Cs, shall mostly focus on the challenges that are very local to our own scenario at PP Sains Komputer with some suggestions for possible solutions.

Program

DAY 1: 27 AUGUST 2013			
TIME	PROGRAM	WHO'S WHO	VENUE
8.30am	Registration	Secretariat	Foyer
9.00 am – 9.15am	Welcoming and Opening Speech	Dean of School of Computer Sciences	Auditorium 1
9.15 am – 10.15am	Keynote I	Prof. Dr. JuhanaSalim	Auditorium 1
10.15am – 10.30 am	Tea Break @ Foyer		
10.30 am – 12.45 pm	Parallel Session	I-Enabling Technologies & Infrastructures	Auditorium 1
		II-Data to Knowledge	Auditorium 2
		III- Service Computing	Auditorium 3
		Poster (Evaluation Session I)	Lobby
12.45 pm – 2.15 pm	Lunch @ Foyer		
2.15 pm – 4.30 pm	Parallel Session	I-Enabling Technologies & Infrastructures	Auditorium 1
		II-Data to Knowledge	Auditorium 2
		III- Service Computing	Auditorium 3
		Poster (Evaluation Session II)	Lobby
4.30 pm – 4.45 pm	Tea Break @ Foyer		
4.45 pm – 5.30 pm	Parallel Session	I-Enabling Technologies & Infrastructures	Auditorium 1
		II-Data to Knowledge	Auditorium 2
		III- Service Computing	Auditorium 3
		Poster	Lobby

Program

DAY 2: 28 AUGUST 2013			
TIME	PROGRAM	WHO'S WHO	VENUE
9.00 am – 10.30 am	Parallel Session	I-Enabling Technologies & Infrastructures	Auditorium 1
		II-Data to Knowledge	Auditorium 2
		III- Service Computing	Auditorium 3
10.30 am – 10.45 am	Tea Break @ Foyer		
10.45 am – 11.45 am	Keynote II	Prof. Dr. MandavaRajeswari	Auditorium 1
11.45 am – 1.15 pm	Parallel Session	I-Enabling Technologies & Infrastructures	Auditorium 1
		II-Data to Knowledge	Auditorium 2
		III- Service Computing	Auditorium 3
		Poster	Lobby
1.15 pm – 2.30 pm	Lunch @ Foyer		
2.30 pm – 4.00 pm	Forum: Graduate On Time	Panels: Dr. SukumarLetchmunan Dr Wong Li Pei Dr. ManmeetMahinderjit Singh Dr. NurulHashimahAhamedHassainMalim Moderator: Dr Putra Sumari	Auditorium 1
4.00 pm – 4.30 pm	Postgraduate society AGM		Auditorium 1
4.30 pm – 5.00 pm	Tea Break @ Foyer		
8.00 pm - 10.30 pm	Dinner & Social Activities <ul style="list-style-type: none"> • Award Ceremony • TraditionalShow • Photo session 	Award giving ceremony: <ul style="list-style-type: none"> • Best poster • Best impact factor journal award Closing by the Dean	DewanUtamaPelajar 'B'

Parallel Sessions

Day 1 Tuesday (27/8/2013)

Track: Enabling Technologies and Infrastructures

Venue: Auditorium 1

Slot 1

1030 – 1115

PR02

GPGPU: Acceleration of The Phylogenetic Tree Construction *

Presenter: Najihah Ibrahim

Supervisor: Assoc. Prof. Dr. Nur'Aini Abdul Rashid

Panels: DrNurulHashimahAhamedHassainMalim, Dr. Wong Li Pei

1115 – 1200

PR03

Cloud Cloudnet Mobile Gaming

Presenter: VaithegyDoraisamy

Supervisor: Assoc. Prof. Dr. Putra Sumari

Panels: Dr. Wan MohdNazmee Wan Zainon, Assoc. Prof. Dr. Wan Tat Chee, Assoc. Prof. Dr. Chan Huah Yong

1200 – 1245

RR02

A Framework for Building A Balanced And Cost-Effective IPTV Delivery Network

Presenter: Suliman Mohamed Ahmed Gaber

Supervisor: Assoc. Prof. Dr. Putra Sumari

Panels: Assoc. Prof. Dr. Wan Tat Chee, Assoc. Prof. Dr. Chan Huah Yong, Dr.Muhamad Fermi Pasha

Special Lunch Slot

1300 – 1345

PR04

Improving The Efficiency of Single Scalar Multiplication for Elliptic Curve Cryptography on Radixes Higher Than Two

Supervisor: Assoc. Prof. DrAzmanSamsudin

Panels: Assoc. Prof. Dr. BahariBelaton, Assoc. Prof. Dr. AmanJantan, DrManmeetMahinderjit Singh

* Denotes a MSc proposal review

Slot 2

1415 – 1500

PR05 Time Gaps Model (TGM) Based Vehicle to Vehicle Safety Messages Dissemination in Vehicular Ad Hoc Network (VANET)

Presenter: SuzilryantiFadilah

Supervisor: Dr. AzizulRahmanMohdShariff

Panels: Dr. Mohd. AdibHj.Omar, Dr. Yap FaToh,

Assoc. Prof. Dr. Wan Tat Chee

1500 – 1545

PR07 Common Radio Resource Management (CRRM), Heterogeneous Wireless Network (HWN), Network Access Selection

Presenter: KhuzairiMohdZaini

Supervisor: Dr. AzizulRahmanMohdShariff

Panels: Dr. Mohd. AdibHj.Omar, Dr. Yap FaToh,

Assoc. Prof. Dr. BahariBelaton

1545 – 1630

RR01 Quality of Service Support For Non-Uniform Node Density Mobile Ad-Hoc Networks (MANETS)

Presenter: Mohammed Abdo Mohammed Mahdi

Supervisor: Assoc. Prof. Dr. Wan Tat Chee

Panels: Dr. AzizulRahmanMohdShariff, Dr. Yap FaToh,

Dr. Wan MohdNazmee Wan Zainon

Slot 3

1645 – 1730

RR04 New Approach for Protein Tertiary Structure Prediction Using Hybridized Artificial Bee Colony Algorithm

Presenter: Zakaria Noor AldeenMahmood

Supervisor: Prof. DrRosni Abdullah

Panels: Assoc. Prof. Dr. Nur'Aini Abdul Rashid, Dr. Ibrahim

Venkat, Dr. Mohd. Azmi Al-Betar

Day 1 Tuesday (27/8/2013)
Track: Data to Knowledge
Venue: Auditorium 2

Slot 1

- | | | |
|-------------|------|---|
| 1030 – 1115 | PR21 | Segmentation of Hippocampus in Brain MRI using 3D Level Set Guided by Modified Coherent Point Drift Registration
Presenter: AnushaAchuthan
Supervisor: Prof. Dr. MandavaRajeswari
Panels: Assoc. Prof. Dr. BahariBelaton, Assoc. Prof. Dr. DhaneshRamachandram, Prof. Dr. Jamaludin Md. Ali |
| 1115 – 1200 | PR12 | Segmentation of Multispectral Medical Images
Presenter: Lim Khai Yin
Supervisor: Prof. Dr. MandavaRajeswari
Panels: Assoc. Prof. Dr. BahariBelaton, Assoc. Prof. Dr. DhaneshRamachandram, Dr. Muhamad Fermi Pasha |
| 1200 – 1245 | PR13 | Robust Temporal Difference Models in Reinforcement Learning
Presenter: KhosrowAmiriZadeh
Supervisor: Prof. Dr. MandavaRajeswari
Panels: Assoc. Prof. Dr. Cheah Yu N, Assoc. Prof. DhaneshRamachandram, Dr. UmiKalsomYusof |

Slot 2

- | | | |
|-------------|------|---|
| 1415 – 1500 | PR14 | Harmony Search Based Hyper-Heuristic Approach for Examination Timetabling Problem
Presenter: Khairul bin Anwar
Supervisor: Prof. Dr. AhamadTajudinKhader
Panels: Assoc. Prof. Dr. CheahYu-N, Assoc. Prof. DhaneshRamachandram, Dr. UmiKalsomYusof |
| 1500 – 1545 | PR16 | A Hybrid Harmony Search Algorithm for the High School Timetabling Problem
Presenter: MohdKhaledYousefShambour
Supervisor: Prof. Dr. AhamadTajudinKhader
Panels: Prof. Dr. MandavaRajeswari, Dr. Ibrahim Venkat, Dr. Wong Li Pei |
| 1545 – 1630 | PR29 | Pair Bonds in Genetic Algorithm
Presenter: Lim Ting Yee
Supervisor: Prof. Dr. AhamadTajudinKhader
Panels: Prof. Dr. MandavaRajeswari, Dr Wong Li Pei, Dr. UmiKalsomYusof |

Day 1 Tuesday (27/8/2013)
Track: Service Computing
Venue: Auditorium 3

Slot 1

- 1030 – 1115 PR24 **Flash Cache Management (FCM) Policy for Large-Scale Video-on-Demand Storage Server**
Presenter: Ola Ahmed Mohammed Al-Wesabi
Supervisor: Assoc. Prof. Dr. Putra Sumari
Panels: En. Azlan Osman, Dr. Mohd. AdibHj. Omar, Dr. AzizulRahmanMohdShariff
- 1115 – 1200 PR26 **An Initial Trust Based Building Mechanism Leading to Purchasing Behavior in E-Commerce ***
Presenter: AszifaBintiAris
Supervisor: PuanNorliaMustaffa
Panels: Dr. Ahmad SuhaimiBaharudin, Pn. RosnahIdrus

Slot 2

- 1415 – 1500 PR22 **Compiling Reusable Learning Objects into Effective Learning Materials for Mobile Devices**
Presenter: Rogers Phillip Bhalalusesa
Supervisor: Assoc. Prof. Muhammad Dr. RafieHj. Mohd. Arshad
Panels: Dr. Putra Sumari, Pn. RosnahIdrus, Dr. Ahmad SuhaimiBaharudin
- 1500 – 1545 PR23 **Enhanced Classification Technique for Image E-mail Filtering by CAPTCHA Models**
Presenter: MallikkaRajalingam
Supervisor: Assoc. Prof. Dr. Putra Sumari
Panels: Assoc. Prof. Dr. AmanJantan, Assoc. Prof. Dr. Cheah Yu-N, Assoc Prof. Dr. Azman Samsudin
- 1545 – 1630 PR27 **Interaction And Cooperation Modeling for supporting View Switching Interactivity in Multiview Video Streaming**
Presenter: SalehahHamzah
Supervisor: Assoc. Prof. Dr. Putra Sumari
Panels: DrMohd. Adib Haji Omar, Assoc. Prof. DrBahariBelaton, En. Azlan Osman

* Denotes a MSc proposal review

Day 2 Wednesday (28/8/2013)
Track: Enabling Technologies and Infrastructures
Venue: Auditorium 1

Slot 1

- 0845 – 0930 PR01 **Optimization in Cloud Database using Bee Colony Algorithm ***
Presenter: Wong Jik Soon
Supervisor: Assoc. Prof. Dr. Chan Huah Yong

Panels: Assoc. Prof. Dr. Nur'Aini Abdul Rashid, DrNurulHashimahAhamedHassainMalim, Dr. Wong Li Pei

0930 – 1015

PR06

Heuristic Inter-Cloud Resource Brokering to Increase User Benefits

Presenter: Nazi TabatabaeiYazdi

Supervisor: Assoc. Prof. Dr. Chan Huah Yong

Panels: Dr.Mohd. Adib Haji Omar, Assoc. Prof. Dr. Nur'Aini Abdul Rashid, DrNurulHashimahAhamedHassainMalim

Slot 2

1145 – 1230

PR08

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

Presenter: PrimantaraHariTrisnawan

Supervisor: Assoc. Prof. Dr. Wan Tat Chee

Panels: Dr. Mohd. Adib Haji Omar, Dr. AzizulRahmanMohdShariff, Dr. Yap FaToh

1230 – 1315

PR09

An Approach for Preserving Evidence in Network Forensics Using Security Model *

Presenter: Mohdlzham Bin Ibrahim

Supervisor: Dr. AmanJantan

Panels: Assoc. Prof. Dr. AzmanSamsudin, Assoc. Prof. Dr. BahariBelaton

* Denotes a MSc proposal review

Day 2 Wednesday (28/8/2013)
Track: Data to Knowledge
Venue: Auditorium 2

Slot 1

0845 – 0930

PR10 A Sentence Generator for Brainstorming *
Presenter: Tan Kian Guan
Supervisor: Dr. Yap FaToh
Panels: Assoc. Prof. Dr. Cheah Yu-N, Dr. Tan Tien Ping

0930 – 1015

PR17 Intelligent Water Drops Algorithm for Fuzzy Rough Set Feature Selection
Presenter: Basem O. F. Aljila
Supervisor: Prof. Dr. AhamadTajudinKhader
Panels: Prof. Dr. MandavaRajeswari, Assoc. Prof. Dr. Cheah Yu-N, Dr. UmiKalsomYusof

Slot 2

1145 – 1230

PR20 Evolutionary-Based Training Algorithm for Supervised-Training of Neural Networks
Presenter: Ahmed A. A. Abusnaina
Supervisor: Prof. Dr. Rosni Abdullah
Panels: Dr. Wong Li Pei, Dr. ZurinahniZainol, Assoc. Prof. Dr. DhaneshRamachandram

1230 – 1315

PR11 Computer Aided 3D Skull - 2D Photo Superimposition in Forensic Anthropology
Presenter: Tan Joi San
Supervisor: Dr Ibrahim Venkat
Panels: Assoc. Prof. Dr. DhaneshRamachandram, Assoc. Prof. Dr. Putra Sumari, Prof. Dr. MandavaRajeswari

* Denotes a MSc proposal review

Abstracts Listing

Day 2 Wednesday (28/8/2013)
Venue: Auditorium 3

Slot 1- Track: Data to Knowledge

930 – 1015 PR19 **An Image-Based Framework for Detecting and Tracking Pedestrian from Top-View Video ***
Presenter: HalimatulSaadiahMdYatim
Supervisor: Prof. Dr. Abdullah ZawawiHjTalib
Panels: Assoc. Prof. Dr Putra Sumari, Dr. Wan Mohd. Nazmee Wan Zainon

Slot 2 –Track:Data to Knowledge

1145 – 1230 RR03 **Intelligent Mammogram Retrieval Engine: Leveraging Best Case Classifier to Detect Mass in MRI Mammogram Images to Diagnose Breast Cancer**
Presenter: Valliappan Raman
Supervisor: Assoc. Prof. Dr. Putra Sumari
Panels: Dr Muhamad Fermi Pasha, Assoc. Prof. Dr. Cheah Yu-N, Dr.Siti Khaotijah Mohammad

1230 – 1315 PR15 **A Study on Ontology-Based and Hybrid Genetic Algorithms Approach in Menu Planning Model for Malaysian Old Folks Home**
Presenter: Ngo HeaChoon
Supervisor: Assoc. Prof. Dr. Cheah Yu-N
Panels: Dr. Wong Li Pei, Dr. NurulHashimahAhamedHassainMalim, Dr. UmiKalsomYusof

Special Lunch Slot– Track: Service Computing

1315 – 1400 PR30 **Factors Influencing Malaysia Local Company to Adopt B2B Standard Implementation***
Presenter: AzizanBinti Ali
Supervisor: Dr Ahmad SuhaimiBaharudin
Panels: Dr. Vincent Khoo Kay Teong,Professor T. Ramayah.

* Denotes a MSc proposal review

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Track: Data to Knowledge

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Track: Data to Knowledge

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Proposal Review

Track: Enabling Technologies and Infrastructures

Optimization in Cloud Database using Bee Colony Algorithm

Wong Jik Soon

Abstract

Database-as-a-Service (DBaaS) has gain significant momentum since emergence of Cloud Computing. A DBaaS removes the burden of provisioning, configuration, scaling, performance tuning, backup and security from database users to service providers. Consumers pay the service for only the resources that they use, just like electricity services. Subscription fee is much cheaper than owning and maintain physical infrastructure alone. Since the maintenance of these large scale databases has become the responsibility of service providers, an optimization strategy is needed in order to minimize the maintenance cost while maximize the profit. As Cloud resources are elastic and the resource demands of database requests are unpredictable, it is challenging to decide when and where to place databases in Cloud environment according to their resource requirements. This study proposed to use Bee Colony Algorithm to tackle the problem above. Bee Colony Algorithm is a swarm intelligence which is based on the foraging behavior in the bee colony.

GPGPU: Acceleration of the Phylogenetic Tree Construction

Najihah Ibrahim

Abstract

Phylogenetic tree construction is the development of a tree of life. It is used to legitimize the evolutionary computing to explore the history, interrelation and diversity of life on the globe. This tree construction process is important to classify the communities and populations of species. Classification of species is a ubiquitous subject in the genetic sequence analysis process as it becomes more complicated and challenging over the years and the complicity continue to be increasing dramatically. 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 posterior process of this genetic sequence analysis procedure. The whole procedure of this analysis has become the rigorous standard for decades. Sequence alignment is the foremost operations before continuing to the last stage which is the phylogenetic tree construction process. The selection of a good sequence alignment method is difficult because there are many alignment programs exist. To manipulate the advantages and to exclude disadvantages of selected method, some preliminary experiments were conducted. The experiments involved comparing a few most use programs such as ClustalW, Kalign, MAFFT, MUSCLE, T-Coffee and Probcons, using constant homology sequences dataset. From the experiments, we proposed MAFFT 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. FastTree, was the phylogenetic tree construction program which run under the heuristic and perform the profile-based methods for the arrangement of tree nodes and taxas position. Through the experiments, we found that, best aligned sequences can affect the phylogenetic tree construction process and result. This program is not well software-hardware integrated, except for running the program using OpenMP. FastTree program also actively focused on enhancing the maximum-likelihood of the phylogenetic tree. To fill the gaps of this program, 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. FastTree program will be improved by implementing the serial program enhancement, parallel programming via multi-core processor with Message Passing Interface (MPI) and Open Multi-Processing (OpenMP), and Compute Unified Device Architecture (CUDA) programming via Graphics Processing Units (GPU) implementation. We expect to get the best accuracy, speed, and time consumption, by comparing these experiments.

Cloud Cloudnet Mobile Gaming

VaitheyDoraisamy

Abstract

Video Games are very popular among children and adults. The number of users is keep increasing each and every year and more games applications are being developed by the developers. The usage of mobile devices such as smart phones, iPads, Tabs, and notebook are the main factor for the increment of mobile games. Most of the low end mobile devices which does not have high processing power, limited memory, and small screen could not anticipate in most mobile games especially 3D mobile games because 3D mobile gaming and real-time mobile gaming require very high processing power for game rendering purpose. Besides that latency is also the main problem for low end mobile devices and this effect the Quality of Service (QoS) of the mobile game. Since the processing power of the device is low, it takes time for the mobile device to capture the game command, render the game and to play the game. This will lead to poor interactivity, poor graphic or features, and delay while playing the games. This paper presents MyCloud Mobile Gaming (MCMG) architecture to overcome all the problems mentioned above where the game engine is installed and executed in the cloud. This architecture combines cloud computing and cloudlets. A main server is placed in the cloud computing and it is responsible for game rendering instead of the mobile devices from doing so. Hence by this way, all types of smart phones can play any type of game since the processing work will be done in the cloud and cloudlets. The main server renders the game output and streams it as H.264/AVC video to the cloudlet servers. Cloudlets which are connected to the cloud computing are created at certain important places such as airports, hotels, and restaurants where the cloudlet server stores the rendered video from main server and stream it to mobile clients. The cloudlet server also captures the game command sent by the mobile devices and injects it into the game process where the cloudlet server renders again the game output to keep the game updated. There is also another problem that arises for MCMG caused by the unpredicted nature of wireless media which causes communication constraints in terms of limited and fluctuating mobile network bandwidth. To overcome this situation, UDP- based RTP/RTCP streaming protocol is used in this MCMG architecture. Besides that mobile clients can request the game videos from the neighbors if the server is too busy or too far. By this way the bandwidth can be fully utilized.

Improving the efficiency of single scalar multiplication for Elliptic Curve Cryptography on radices higher than two

ArashEghdamian

Abstract

Cryptography is a form of public key cryptography that offers good security. Even though elliptic curves (EC) have been studied for more than a hundred years, their practical aspect in public key cryptography was independently invented by Koblitz and Miller, in 1984. Since then elliptic curve cryptography (ECC) has drawn more attention of different research communities, due to the hardness of the elliptic curve discrete logarithm problem and shorter key length, compared to that of other existing public key cryptographic algorithms, such as RSA and ElGamal. Shorter key length needs less power consumption, computing effort and storage requirement, So these aspects would be dramatically useful in portable devices such as PDAs, cell phones, RFIDs, etc. Therefore, a lot of research has been conducted to speed up and improve ECC implementations, mainly focusing on the most important and time-consuming ECC operation which is scalar multiplication. It depends on the representation of the scalar k . The binary method is the standard unsigned method that is used to compute the elliptic curve point $Q = kP$. Researchers found that it is not the most efficient way for implementing elliptic curve computations. One way is to increase the radix of k from two to a higher radix and use more memory instead of computing power and time. Also some recoding methods such as CR, NAF, and MOF were presented in order to enhance the efficiency of EC computations.

Time Gaps Model (TGM) based Vehicle to Vehicle for Efficient Safety Messages Dissemination in Vehicular Ad Hoc Network (VANET)

SuziIryantiFadilah

Abstract

Crashes cause million dollar losses, take lives, and drastically reduce the productivity of the transportation infrastructure in almost everywhere around the world. To find means to prevent them, Vehicular Ad-Hoc Networking or VANET become meaningful component of ITS (Intelligent Transport System), which provides communication technology on the road between vehicles. The development of VANET for ITS can significantly enhance driving safety and support the traditional traffic management functions. Whereby, each vehicle that equipped with wireless communication to exchange information with other vehicles especially early warnings of sudden breaks and accidents ahead via the inter vehicle communication. This is important to provide driver a time to react in order to avoid possible accidents ahead. This research will be focused on developing the Time Gaps Model that simulating driver reactions time model to ensure safety driving while disseminate emergency messaging in vehicular ad hoc network. As a result, the proposed model will be integrated to be applied in developing of safe cluster formation and efficient safety message data dissemination. The proposed model will be studied using NS2 and SUMO simulation programs.

Heuristic Inter-cloud resource brokering to increase user benefits

Nazi TabatabaeiYazdi

Abstract

These days, cloud-computing has become increasingly popular for scientist and other highperformance-computing (HPC) users. The concept of cloud-computing enables users to have access to infinite resources, in an elastic and pay-as-you-go manner. Some of the advertised advantages of the cloud-providers are their ability to significantly reduce the upfront-cost, totalcostofownership and hardware management-controls, for the customers. However, due to the elastic nature of cloud computing and the ability of on demand scaling, customers may use more resources than what they actually need, which may result in a higher cost. Unplanned rental of cloud resources might also increase the expected expenditures, caused due to the dynamic pricing offered by a cloud provider. These issues highlight the importance of dynamic elasticity control measurements and restrictions from the user's side. In this research, an overview of some of the previously proposed approaches for solving these problems has been introduced. The aim of this work is to increase the user's benefits in infrastructure-as-a-service-clouds (IaaS) cloud resource leisure. To address this question, we are proposing a cloud-brokering middleware. We later, tune this component using the proposed heuristic multi-objective-optimization algorithm, to increase the user's benefit while providing same levels of service. We then evaluate our approach and findings based on syntactic and real world scientific workloads in our Grid Computing lab prototype cloud environment. The result of the experiments shows the effectiveness of the proposed method for increasing the user's benefit and its impacts on elastic scaling.

Common Radio Resource Management (CRRM), Heterogeneous Wireless Network (HWN), Network Access Selection

KhuzairiMohdZaini

Abstract

The main design philosophy of 5G is to create a human-centric platform that enables technologies, systems and networks to globally interact, inter-connect, and communicate into a flexible and dynamically operating architecture. As such, static usage of services from a single operator may no longer be capable of satisfying user demands in the near future, although in reality, there exist variety of wireless technologies that are accessible by the users. Therefore, Future Wireless Networks (FWN) have been proposed as a means to explore the possibilities for such revolution in the way in which cellular networks are owned and operated. The challenges of FWN lie not only on the technical efficiency but also whether different constraints given by user's preferences are met, and this will have adversely impact on the entire system. The ability to change parameters adaptively and automatically without operator intervention and sharing the resources across other operators are amongst the new challenges to be addressed by resource management in FWN. Joint/Common Radio Resource Management (CRRM/JRRM) and Dynamic Spectrum Allocation (DSA) are both promising approaches in the FWN to increase overall QoS and spectrum efficiency. Through extensive analytical and simulation study, this research is aimed to produce a novel method in selecting the optimum wireless access, which optimizes the overall resources and at the same time optimize per-user QoS. The method should be able to satisfy the network operators by maximizing their profit and high resource utilization, and meeting users' satisfaction through their expected Quality of Services (QoS). The expected outputs from the research are the development of an enhanced framework of CRRM and analytical model that infuse several aspects of FWN.

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

PrimantaraHariTrisnawan

Abstract

Internet's cloud computing provides services to its users. In combination with popularity of MANET, it causes high Internet access from MANET to Internet via MANET gateways. The number of mobile nodes in a specific MANET domain creates MANET node density. However, node density may not distribute uniformly among MANET gateways. Most nodes prefer selecting the nearest gateways using "short path" algorithm. It can cause congestion or unbalanced load among available gateways. 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 mobile node will only pass through the pointed gateway. The approaches are addressed to how a mobile node selects its "gateway", what algorithm is used to fairly distribute node to each gateway, what network topology might be applied, and what routing protocol is suitable to support this goal. These approaches will 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. A proactive MANET routing protocol will be chosen and enhanced with additional messages resulted from the algorithm. From routing information, each gateway will fairly handle some nodes only (ie. roughly number of all nodes divided by number of gateways). Each node will receive broadcast messages from internal gateways 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.

An Approach for Preserving Evidence in Network Forensics using Security Model

MohdIzham bin Ibrahim

Abstract

Network Forensics Investigators apply most of the network monitoring tools, such as Snort or WinPcap to monitor or identify potential evidence to be collected and stored. However, these tools are lack of protection mechanisms to keep the evidence safe as well as the rising issues of chain-of-custody that are not properly managed or addressed. Therefore, people with intentions may disrupt the collection process and tampered the contents of the stored evidence. Any potential evidence that are not accurate, complete, reliable and verifiable will certainly affect the decision among the jury and judges. Considering there issues, a Defensive Evidence Model (DEM) is proposed, to manage the evidence collection processes as well providing defensive measures to protect the evidence. Features of the DEM are a result of adapting security models; Bell-LaPadula, Biba, Clark-Wilson and Goguen-Meseguer Model and integrate with Digital Forensics Investigation process. The assessment of DEM will be performed from two different aspects, by analyzing the attack and evaluating Confidentiality, Integrity & Availability of DEM storing the evidences.

Track: Data to Knowledge

A Sentence Generator for Brainstorming

Tan Kian Guan

Abstract

Brainstorming is a tough process for us because it is tiring and does not always give desired results. Yet, this is one of the ways where most of the ideas can be generated. However, the lack of ideas during discussion is one of the factors that will make the discussion unfruitful. Moreover, depending on human as the only source to generate ideas will not always be able to contribute as many ideas. Although scientists have implemented various ways such as calculation, logics, rules and others to make machine almost intelligent as a human, the actual outcome however is only a machine that will generate answers instead of one which will generate and provide ideas that will help overcome the problem of lack of ideas during discussion. The proposed solution of this research is to design an engine that can generate ideas to aid human in brainstorming. This engine is a thinking machine that will think and provide us alternative ideas to be reviewed in order to smoothen the discussion. In the design, a set of good meaning representation for each word will be used to represent ideas, because words are the core for expressing the meaning of an idea. The engine will take the key words of the discussion topic as the input to search for any topic related words. After that, it will make use of these words to construct a list of sentences. The sentences will be reviewed by the brainstorming members which may trigger members to think other ideas. The process can be repeated to explore wider ideas by accepting the keywords of sub-topics as input. An experiment is carried out within small group discussion to evaluate the efficiency of this brainstorming technique. Then this is followed by requesting the participants to answer questionnaires for further analysis.

Computer Aided 3D Skull - 2D Photo Superimposition in Forensic Anthropology

Tan Joi San

Abstract

Craniofacial superimposition in forensic anthropology is the process of searching the identity of an unknown skull by superimposed with 2D face images that reported missing. In this research, this process is carried out by collaborating with computer-aided (CAD) approach that implemented with important anthropological conditional parameters. This approach is a novel attempt in craniofacial superimposition. This superimposition process occurred between scanned 2D face images and 3D CT skulls. Approximately 12 corresponding facial and craniometric landmarks are chosen manually. After that, z dimension of the 2D face images for relevant landmarks are estimated by aligning with an average 3D face model. The average face model is attained from 100 of face models that scanned using laser range scanner and aligned with procrustes analysis. Later, a new technique called “rigid constraint transformation” is proposed and applied to perform alignment between the upgraded 2D face and 3D skull. This transformation approach is based on life size and orientation conditional parameters that applied in forensic anthropology. The idea is to select the appropriate landmarks from different planes of both objects and obtained accurate transformation (scaling, rotation and translation) values which obeyed the parameters. Lastly, registration is carried out to evaluate the match between the face and skull. Curve fitting technique is proposed for the registration process instead of point based. 2D curves are formed from the lower part of the face (jaw) and skull (mandible) using cardinal splines. Then, polynomial function such as B-spline is implemented to examine the traits between the curves. Curves with similar traits are stated as positive match. Various experiments are carried to evaluate the accuracy of the superimposition for this research. The results are compared with any available online published sources. There are three main contributions: - (1) Obtained z-dimension using face models, (2) new technique, “rigid constraint transformation” is proposed based on the conditional parameters, (3) curve fitting technique in registration process to evaluate the match between face and skull. All of the approaches that proposed are new attempt in CAD for craniofacial superimposition.

Segmentation of Multispectral Medical Images

Lim Khai Yin

Abstract

Multispectral medical imaging has slowly gained more attention from the field of medical research as more information about the structure and properties of the images can be deduced. However, the focus of this work will be on the initial phase of multispectral image segmentation, where segmentation of single band image using the spatial method, random walks algorithm will be utilized. In this work, fuzzy affinity will be incorporated in to the random walks algorithm in order to enhance the accuracy of the segmentation. The two components, homogeneity based and object feature based components that constitute the fuzzy affinity will replace the crisp intensity differences in the weighting function of random walks. Besides that, the alternative way of combining the intensities with other feature, GLCM in random walks algorithm will also be studied.

Robust Temporal Difference Models in Reinforcement Learning

KhosrowAmiriZadeh

Abstract

Tendency toward using decision-making systems under uncertainty in many disciplines has grown quickly. Intelligent control, medical treatment advisory, medial disease detection and autonomous machine learning are samples of applications in which decision maker should make a precise selection under lack of information. Reinforcement Learning (RL) is a goal oriented approach that operates based on long term benefits. A RL agent can interact with environment to estimates a value and iteratively improves it until actual value of each option is obtained. RL models are built based on theory “estimation based on estimation”. These models are widely used in online applications in which the controller sequentially selects the best option among many choices under ambiguity conditions. Classical RL include three major parts: (1)action selection model, (2) naïve temporal difference (TD) model, and (3) temporal difference with function approximation (TDFA) model. Each model uses several different recursive structures to find the value of each option. Although these models operate well, there are some weaknesses/difficulties in the implementation, especially about on line applications, where the observations may be vary with time. Furthermore with some small changes in the original setting, these problems are observed. Adaptive RL models are functioning based on some sensitive parameters that should be predefined exactly. Tuning the parameters and step sizes are two critical subjects can affect convergence quality. Of course, most adaptive algorithms suffer from this weakness. Both applying inaccurate value to these key parameters and changing the basic structure can cause the adaptive RL-based models lose the convergence. In fact, most adaptive RL models are presented with some limitations and usually are problem dependent. Therefore, using the recursive RL models in online applications or situations with non-stationary observations arises some challenges. The major focus in this study is presenting parameter-free RL models to decrease these dependencies. The steepest descent (SD) optimization approach is used to make the robust RL structure. The approach tries to find optimal value for parameters automatically. By using this modification the parameter dependencies problems surely will be removed. Besides, the convergence rate will be increase. These modifications may extend the RL approach into the more real-world applications. Especially, in both machine learning and adaptive control engineering applications where, most iterative models couple with some tables including exact parameter setting. The modification should be applied in all three models of RL approaches.

Harmony Search Based Hyper-Heuristic Approach for Examination Timetabling Problem

Khairul bin Anwar

Abstract

Examination timetabling problems (ETP) is a combinatorial optimization problem which belongs to NP-hard class in almost all off its variations. Harmony Search Algorithm (HSA) is a relatively new meta-heuristic algorithm inspired by the musical improvisation process. The Hyper-heuristic (HH) is a new trend in optimization that uses a high level heuristic selected from a set of low-level heuristic methods. Hyper-heuristic can be referred as “using heuristic to choose heuristic” and this method actually tries to find the best heuristic to solve the optimization problem. This research proposed a Harmony Search-based Hyper-heuristic (HSHH) method for ETP. In HSHH approach, the HSA will operate at a high level of abstraction which intelligently evolves a sequence of improvement low-level heuristics to use for examination timetabling problem. Each low-level heuristics represents a move and swap strategies. The proposed method has been tested using ITC-2007 benchmark datasets that has 12 de factor datasets of different complexity and size. The proposed method produced competitively comparable results.

A Study on Ontology-Based and Hybrid Genetic Algorithms Approach in Menu Planning Model for Malaysian Old Folks Home

Ngo HeaChoon

Abstract

The number of older people in Malaysia is not only rising rapidly but also in their life expectancies. Increasing number of old age group presents a real challenge to nutritionists and health professionals. Thus, proper nutrition for elderly is important to maintain the health and well-being of older people that can lead to fulfilling and independent lives. Nowadays, there are many diet recommendation systems in the market that provide general advice to the clients. These systems are still insufficient to provide custom-made diet plan based on the elderly people who might be at risk of malnutrition. This research presents a study on menu planning using ontology-based and hybrid genetic algorithms approach for Malaysian old folks' home. Ontology is used to model the personal information of the elderly and food database. Hybrid genetic algorithms are then employed to ensure that the constructed menu is satisfied all the objectives and predefined constraints. The proposed work aims to (i) produce a diet plan representation based on diet plan ontology; (ii) design a planning engine using hybrid genetic algorithms; (iii) evaluate the diet recommendation approach.

A hybrid harmony search algorithm for the High School Timetabling Problem

MohdKhaledYousefShambour

Abstract

High School Timetabling Problem (HSTP) is one of a wide category of timetabling and scheduling and a well-known hard computational problem. HSTP requires assignment of events (meetings), such as classes, teachers, courses and students, to time-slots under a set of different types of constraints: hard and soft. Hard constraints must be satisfied, while the violation of soft constraints should be minimized. Due to the NP nature of high school timetabling problems, the exact solvers may not find a solution even for moderately sized versions of the problem. This proposal presents an adoption of a population-based Harmony Search Algorithm (HSA) to solve HSTP. To empower the exploitation capability of HAS, HSA is hybridized with a Simulated Annealing (SA) as local search-based method. This provides an improved balance between global exploration and local exploitation of the search space. The hybrid metaheuristic optimization approach tested on twelve International Timetabling Competition (ITC) 2011 benchmark instances as an initial study. The results show the significance of the proposed approach in producing high quality solutions when compared with other existing state-of-the-art techniques that are used to solve the problem.

Intelligent Water Drops Algorithm for Fuzzy Rough Set Feature Selection

Basem O. F. Alijla

Abstract

Feature selection (FS) is the process of selecting the minimum number of features that mostly represent the knowledge of the entire original features. FS is considered as a combination of two fundamental components: search techniques, evaluation function. Several search strategies such as complete, heuristic, and meta-heuristic have been adapted with several machine learning model or independent statistical as evaluation function. The former techniques call wrapper-based feature selection and the latter is called filter-based feature selection. Intelligent Water Drops (IWD) algorithm is a recent natural-inspired meta-heuristic algorithm imitates the phenomena of water flow in the bed of a river. The IWD algorithm has been successfully tailored to several optimization problems. In this proposal the IWD algorithms is integrated with Fuzzy Rough Set (FRS) approach as a filter-based feature selection algorithm call Intelligent Water Drops for Fuzzy Rough Feature Selection (IWD FRFS). The ultimate goal of this research is to overcome the drawbacks of IWD as optimization algorithm to solve the feature selection problem. The rate of convergence of the IWD algorithm soil-velocity dependent. Soil-velocity update is relevant to the number of drops as is dependent on the soil and velocity update. To solve the aforementioned gaps and achieve the goal the standard components of IWD shall be modified. The main components involve velocity update, local and global soil update, and search model. Moreover the modification aims to balance the exploration and exploitation. Standard and the improved versions of IWD shall be evaluated and validated on a several bench mark data sets. The applicability of the algorithm shall be evaluated on very large-scaled of application area. The proposed algorithm should be evaluated with text mining and gene expression microarray (GEM) analysis problems.

An image-based framework for detecting and tracking pedestrian from top-view video

HalimatulSaadiyahMdYatim

Abstract

Nowadays pedestrian safety and monitoring is a very important consideration in many situations. Detecting, tracking and extracting pedestrian movements from a video can be used to gain more understanding on crowd features and behaviours. Beside of using the extracted pedestrian data for the security purpose, these data could also be useful as an empirical data to calibrate with a simulation model and also in enhancing design architecture. The existing works on pedestrian detection and tracking have some limitations. For example some works focus on a specific event and a specific place, and some require a lot of human interaction. Therefore, an image-based framework for detecting and tracking pedestrian movement from a top-view video is proposed. By using the top-view video it is possible allow the detection and tracking to be done automatically or with no human intervention. The proposed framework consists of several steps namely pedestrian detection, pedestrian tracking and geometric distortion correction. Besides, it is possible to detect individual pedestrian in sparse crowd, and the trajectory and the estimated speed of the pedestrian. This automated framework can be used in some specific places such as at entrance of a building or a hall.

Evolutionary-Based Training Algorithm for Supervised-Training of Neural Networks

Ahmed A. A. Abusnaina

Abstract

Neural network (NN) is an interconnected group of processing units “artificial neurons” via a series of adjusted weights; these neurons use a mathematical model for information processing to accomplish a variety of tasks. The training process deals with adjusting and altering the weights and/or structure of the network depending on a specific training algorithm. Training of NN fall into two main categories: traditional learning algorithms and Evolutionary-based training algorithms. Traditional training algorithms have some drawbacks such as local minima and its slowness. A new evolutionary-based algorithm is proposed for supervised training of NN.

Segmentation of Hippocampus in Brain MRI using 3D Level Set Guided by Modified Coherent Point Drift Registration

Anusha Achuthan

Abstract

Medical image segmentation has been progressing rapidly in past decades. The vast amount of attentions and breakthroughs that have been extensively explored thus far demonstrate the significant of this field to the imaging community (Ma et al., 2010; Withey and Koles, 2008; Dhawan, 2003; Pham et al., 2000). It is one of the critical key areas in medical image analysis, which identifies and delineates a structure of interest from an image. Despite large number of relative success, medical image segmentation still remains as an unsolved research area. The main challenge remains on producing segmented regions that carry specific visual definitions as accurate to human perception. Generally, medical experts identifies and interprets a given medical structure based on information about the underlying properties that can be found explicitly from the structure itself and prior knowledge on the spatial configurations and organizations of the structure in the image. The inherent explicit structure’s properties refers to features that can be retrieved from the images, such as shape, intensity, texture, edge, second-order or higher-order feature spaces. These image features may be computed using low level image processing techniques (Sonka et al., 1999). Whereas, spatial knowledge represents information on spatial context of the structure in reference to an image. This may include referential location/landmarks, size of the related structure and spatial context of the structure in relation to their surroundings or domain. The sources of spatial knowledge are usually obtained from medical ontologies or medical atlases that contain manual annotations of medical structures by medical experts. This spatial knowledge is highly useful in identifying rough estimate on the locality and area of the structure of interest when utilization of image features alone fails to provide good discriminative attributes. In this research, it is intended to propose a segmentation approach imitating medical expert decision making process by integrating image and spatial knowledge. This approach will be validated using hippocampus in brain MRI as case study.

Pair Bonds in Genetic Algorithm

Lim Ting Yee

Abstract

This work provides a comprehensive investigation on the concept of pair bonds (monogamous pairs) for mating phase in genetic algorithms (GAs). GA is a heuristic search technique based on the principles and mechanisms of natural selection grounded on the theory of survival of the fittest. Traditionally, parents are selected at every generation to reproduce offspring through crossover and mutation operations. The process reiterates until some termination conditions are met. However, nature sometimes exhibits the formation of enduring relationships between mating partners. In modern human society, some avian model, fish, rodents, and even lizards, pair bonds are integral aspects of their social behaviour. These species usually share the same mating partners throughout their lifetime-socially monogamous. Taking the cue from nature, this thesis studies the feasibilities of pair bonds in GA. It is possible that GA may benefit from the exploitative behaviour of monogamous pairs. In the proposed methodology, coined as Monogamous Pairs Genetic Algorithm (MopGA), parent selection mechanism is minimized. In each generation of this GA, monogamous pairs of chromosomes yield two offspring, and only the best two offspring of the four chromosomes survive into the next generation, while the parents are retained until next selection season. Occasional infidelity generates variety and spreads genetic information through the population. We will demonstrate the utility of MopGA through a sequence of case studies in various application domains, including real-world numerical function optimization problems, traveling salesman problems, knapsack problems, Onemax, and Royal Road problems. This work provides an insight into the pair bond concept by exploring when and how it can be useful in GAs. Consequently, it also contributes to a deeper understanding of GAs, by evaluating their strengths and weaknesses with regard to the particular challenges posed, at least by the domain studied. We also develop a novel adaptive model for dealing with infidelity. We shall rigorously investigate the performance of MopGA on different notable benchmarks. The preliminary tests reveal that MopGA can be executed in less processing time without trading off solution quality when compare with the standard genetic algorithm.

Track: Service Computing

Compiling Reusable Learning Objects into effective learning materials for Mobile Devices

Rogers Phillip Bhalalusesa

Abstract

Mobile learning is an emerging field which uses mobile devices to conduct learning activities. Unfortunately most of the institutions do not have learning materials that can be used in mobile devices. Developing mobile learning materials from scratch is difficult and therefore the technique of reusing online learning objects is usually employed. However searching, retrieving and organizing online learning objects require educators to use advanced ICT skills and devote a lot of time and hence many educators fail to get the relevant learning objects. To increase the availability of effective mobile learning materials, semantic web and ontologies can be used to automatically search, retrieve and compile the learning objects into mobile learning materials. The challenges with automatic compilation of learning objects are the facts that not all online learning objects are effective for mobile devices, the learning objects metadata are not readily available and learning objects on their own are not effective until they are combined with others learning objects into learning units. A model is therefore important to establish what is needed to develop effective mobile learning materials from online learning objects. This thesis therefore examines a semantic web model for development of effective mobile learning materials based on the public metadata that can be found within search results and learning preferences from learning management systems. The model will establish the effective learning objects for mobile devices and presents the method to retrieve those learning objects from the repositories and lastly compile them into complete learning units.

Enhanced Classification Technique for Image Spam E-mail Filtering by CAPTCHA Models

MallikkaRajalingam

Abstract

The users receive a huge number of spam e-mails every day without their consent. These spam e-mails causes the mailboxes are filled and needs more time to delete these emails. Moreover, the junk emails are another type of spam emails that includes the aspects that email is unsolicited and sent in bulk. Image-based spam or image spam e-mail is a spam email, which contains text and image contents and usually used for advertisements. Image spam e-mail involves nearly similar messages sent to numerous recipients by spammers. Spammers are sending spam e-mail with image content to deceive anti-spam solution. The current techniques to classify such image based spam emails are unable to filter them accurately. This is a serious problem that allows the spam emails still disturb the users. The inaccurate identification of the text can be occurred if this text is too distorted. Moreover, recognizing the occluded text in images is one of the important issues in image processing. Finally, detecting the distorted text in noisy background or complex background is difficult. The scope of this thesis includes the identification and classification of occluded, swing, and scrambled texts inside CAPTCHA images of spam e-mail classification. Therefore, in this thesis, identification and detection of text from images are proposed as discriminative features for image spam classification. Hence, three Completely Automated Public Turing Test to tell Computers and Humans Apart (CAPTCHA) models are combined to obtain better classification accuracy for image spam e-mail. Ultimately, an enhanced text-based CAPTCHA models is proposed for image spam e-mail classification. A CAPTCHA is a program to generate and determine whether or not the user is human. In these models, individual tests performed randomly to fool spammers by using near-duplicate algorithm. Then, identified text is matched with keyword list to classify image spam e-mail based on evaluation process. The performance evaluation metrics, which used in this thesis, include False Positive (FP), False Negative (FN), True Positive (TP), and True Negative (TN) respectively. The expected accuracy provides comparable and secure or superior to existing techniques.

Flash Cache Management (FCM) policy for large-scale Video-on-Demand storage server

Ola Ahmed Mohammed Al-Wesabi

Abstract

Large-scale video-on-demand (VoD) services use hard disk drives (HDDs) to store huge video files for their capacity. The performance of VoD is limited by the relatively lower access bandwidth and higher access latency of HDD. These limitations increase dramatically when there are a large number of requests to a VoD server simultaneously. On the other hand, flash-based SSDs (solid state drives) have an attractive storage device with faster access speed for an intensive reading system like VoD. Unfortunately, replacing the entire HDD by SSD is costly due to its high price per gigabyte. Therefore, hybrid storage HDD and small capacity of flash-based SSD can provide high performance with cost-effective to the storage subsystem for VoD server. The main goal is to improve the performance of the VoD server by maximizing the number of concurrent user requests and minimizing the startup latency while providing a cost-effective way. Flash-based SSD stores only popular videos to provide fast access for read-intensive workloads. This research proposes a flash cache management scheme (FCM) that uses flash-based SSD as non-volatile cache. FCM scheme controls the access of multi-requests for the same video file which reduces multi buffering for the same data. This scheme is done in two scenarios. The first scenario replaces RAM by flash-based SSD in VoD server. This case considers the write workload due to the buffer cache in flash-based SSD for unpopular video that is stored in HDD. To avoid the negative effects of the garbage collection and erase-before-write, FCM adopts OP-FCL to manage the storage capacity of the SSD during buffering. The second scenario uses flash-based SSD as cache in conjunction with RAM. The proposed work is expected to satisfy the performance requirements of large-scale VoD server in terms of I/O bandwidth and access latency.

An Initial Trust Based Building Mechanism Leading to Purchasing Behavior in E-Commerce

AszifaBintiAris

Abstract

Trust is the key factor in ensuring e-commerce success and had emerged rapidly in e-commerce research. One of the important areas in trust studies is on the mechanism that has to be provided by the e-commerce retailer in ensuring trust during 'first time' interaction between consumers and the e-commerce website that lead to purchasing behavior. There are large numbers of articles in understanding trust phenomenon in e-commerce research, yet there is no clear theoretical framework exist due to the complexity and multidimensional nature of trust. This brings the significance in continuing the research regarding trust mechanism that will lead to proposed theoretical framework in trust in e-commerce research. In this research, a mechanism on initial trust that lead to purchasing behavior in e-commerce is studied and a conceptual framework of the mechanism is build. This research will be using quantitative method that use questionnaires as tool to collect data from target respondent of person that often use internet in their routine such as professionals and students. Questionnaires will be designed to get the input regarding concepts being used to build the framework - (dispositional trust, interpersonal trust, institutional trust, cognitive trust, emotional trust, trusting belief and trusting intention) and initial trust antecedent's construct of website information quality, assurance and website interactivity. A consumer feedback from the questionnaires is expected to find out the validity of the proposed framework. Expected contribution for this research is a conceptual framework on initial trust based mechanism that can be a reference for e-commerce retailer, with ability to promote purchasing behavior among consumers in e-commerce during 'first time' consumer's interaction with the e-commerce website.

Interaction And Cooperation Modeling for supporting View Switching Interactivity in Multiview Video Streaming

SalehahHamzah

Abstract

View switching is a key characteristic of multiview video which offer users better viewing experience than conventional single view video. It provide interactivity feature to switch freely between any two adjacent views and enjoy three dimensional panoramic scenes. However, there are two challenging issues regarding interactivity for multiview video streaming service. First, the heavy burden of transmission and decoding due to the large amount of interview statistical dependencies contained in the video that taken from the same scene by multiple cameras from different viewpoints. Therefore to support interactivity, the videos must be compressed with efficient coding scheme to decode it with little delay. Second, self-interested behavior of users in peer to peer streaming and frequently switching view as users likely to watch their interested views at different time makes harder to stimulate user cooperation although it could reduce high server's upload bandwidth. This research proposal will focus on the second issue with four objectives: (1) Design a conceptual model which describe components requirement and process identification for interaction modeling, (2) Design an incentive mechanism by exploiting user's reputation to stimulate cooperation and able to enhance their reputation to obtain long term utilities, (3)Propose a strategy that could show the voluntary of peer to choose high level of cooperation that is full cooperation in the network, (4)Propose a peer interaction and cooperation model as an optimal policy to support view switching. This study proposes to use game theory as a solution for interaction problem because through game design each peer must maintain the cooperation for bandwidth sharing resources. The experimental study will be conducted according to simulation modeling methodology specifically refer to discrete event simulation method. At first investigation, pre-encoded multiview video data will be use and three basic components to be studied which are view switching model to capture user's behavior, a rule to manage reputation value to stimulate cooperation and probabilistic model as a decision making process. Three utility functions will be calculated as a performance measurement to show high level reputation can encourage users to help each other to switch views for long term user interaction.

Factors Influencing Malaysia Local Company to Adopt B2B Standard Implementation

AzizanBinti Ali

Abstract

In competitive business environment many companies are implementing electronics method of sending business information. Organizations are finding ways to improve business operations. The improvement in supply chain management finally benefit to better operation. One of the least human interference method when interact with business trading partner, is by implementing Business-to-Business (B2B) standard implementation for example, Electronic Data Interchange(EDI), Rosettanet standard and Open Application Group (OAGi) which EDI and Rosettanet have been promoted by Malaysian government to adopt. Preliminary studies are carried out to understand the factors influencing the adoption of B2B standard in Malaysia. The preliminary study is to support the study and provide actual situation face by Malaysian company when adopting technology. Model of Technology, Organization and Environment (TOE) are identified to be the model of factors influencing Malaysian company to adopt B2B standard. The factors are perceive benefit, solution characteristic, top management's knowledge, infrastructure readiness, support from government and trading partner's pressure. In addition, factor high business volume is introduced as moderating factor for the Malaysian company to adopt B2B Standard. Research methodology will be a set of questionnaires and will be carried out by post mail survey to 350 of manufacturing companies.

Research Review

Track: Enabling Technologies and Infrastructures

Quality of Service Support for Non-Uniform Node Density Mobile Ad-Hoc Networks (MANETS)

Mohammed Abdo Mohammed Mahdi

Abstract

A Mobile Ad Hoc Networks (MANET) is a collection of mobile nodes that can communicate with each other without utilizing any fixed based-station infrastructure and centralized management. MANETs are especially popular in locations lacking a fixed communication infrastructure, such as natural disaster sites or battlefields. The different density of mobile nodes from one area to another is defined as Non-Uniform node density. Some areas such as buildings have high density while other areas such as parks and roadways have low density of mobile nodes. Typically, the non-uniform node densities influence the performance of the network. For instance, packet delivery ratio is expected to be high in the high density networks and low in the low density networks. The communication between nodes in non-uniform density network faces the challenge of low connectivity. In such condition of low connectivity, MANET nodes are more susceptible to link breakages, which also lead to impact the quality of service (QoS) in the network. This thesis proposes Multipath Cluster Based Routing protocol (MP-CBRP) to address the problem of low connectivity in non-uniform density networks and to improve the QoS for MANET. Existing Cluster Based Routing Protocol (CBRP) which is single path protocol is enhanced to become multipath protocol (MP-CBRP). MP-CBRP is able to avoid traffic congestion and frequent link breaks in communication because of the nodes mobility, through providing load balancing and route failure protection. The load balancing and route failure protection are important features provided by distributing the traffic among set of multiple paths. The benefits of these features make MP-CBRP able to enhance the QoS for MANET by reducing delay and increasing packet delivery ratio and throughput. An analytical model is used to prove the efficiency of the proposed MP-CBRP in the QoS enhancement. The analytical results show that the performance of MP-CBRP is higher than single path CBRP. Additionally, a simulation experiments using Network Simulator (NS2) are performed to implement the proposed MP-CBRP. The finding results demonstrate that MP-CBRP is effective to improve the MANET QoS. A comparison evaluation shows that MP-CBRP has the highest packet delivery ratio and data throughput. Moreover, MP-CBRP has the lowest end to end delay comparing to CBRP, AODV and AOMDV.

A Framework for Building a Balanced and Cost-Effective IPTV Delivery Network

Suliman Mohamed Ahmed Gaber

Abstract

In shared IPTV delivery networks, load imbalance can be occurred due to the inadequate content allocation and improper requests forwarding, which caused by not considering the non-uniform request access patterns of both contents and users. This problem degrades the Quality of Service for the provided IPTV services. Therefore in this thesis, we will focus on such load imbalance problem over the recent architecture, peer-service area architecture, to build a framework for a balanced and a cost effective delivery network for IPTV services. To achieve this goal, several key issues of IPTV delivery networks are addressed. These issues include investigating the Load imbalance in delivery networks, solving the replica placement problem that considers the load balancing during the content replication, and finally integrating the replica placement problem with server placement problem to build a virtual delivery network model that is considered a more cost-effective than the physical delivery networks. In the proposed framework, we propose and evaluate a predictive and content-aware load-balancing algorithm, which takes into consideration the load status of both contents and servers. We also develop an optimal replica placement strategy to minimize the storage and redirection cost with respect to the load balancing property. Furthermore for more cost-effective delivery option, an optimal virtual network-provisioning model is suggested to address the provisioning issues of virtual network. To evaluate the proposed framework, both of simulation and prototyping are used with empirical data. The experimental results shows the superiority of the proposed framework in terms of load balancing, throughput, and storage cost. The experimental results are obtained with a variety of parameters including popular distributions, the popularity skewness, and redirection penalty.

New Approach for Protein Tertiary Structure Prediction Using Hybridized Artificial Bee Colony Algorithm

Zakaria Noor AldeenMahmood

Abstract

By resolving genetic code of human DNA, the amino acid sequence of proteins encoded can easily be predicted and proteins can be subsequently classified into families and subfamilies. However for a given protein, knowing the exact action whether hormonal, enzymatic, transmembranal or nuclear receptors, etc does not depend solely on amino acid sequence but on the way the amino acid thread folds as well. Determining the proteins tertiary structures using experimental methods is time consuming and expensive; taking into account that not all proteins 3D structures can be obtained experimentally. Many computational methods have been proposed in order to overcome the timing and cost issues. This study aims to provide a new approach for protein structure prediction problem (PSP). Several new methods will be used to develop and evaluate the new approach with the aim to produce better results in protein 3D structure prediction. The research consist of three main phases namely Data Collection and Pre-processing, Protein Structure Prediction and Evaluation of the Proposed Approach. This work introduces a new Hybrid Artificial Bees Colony (HABC) Optimization algorithm which will be used in the searching step of this new approach. The experiment will be conducted on short sequence proteins that have been used by the previous researches Tools such as SPSS and Weka also will be used for analyzing and pre-processing of the dataset during the implementation of the proposed approach.

Track: Data to Knowledge

Intelligent Mammogram Retrieval Engine: Leveraging Best Case Classifier to Detect Mass in MRI Mammogram Images to Diagnose Breast Cancer

Valliappan Raman

Abstract

Breast cancer is the major frequently diagnosed cancer diseases for women in the western world and in Malaysia. As per surveys, breast cancer leads second after lung cancer in death rates of women. Mammogram Screening is the effective and essential technique for early detection of breast cancer. However, it is a challenging task for radiologist and experts to achieve an accurate and proper evaluation from the huge number of mammogram screenings. In a mammographic session four X-ray images (two views - typically craniocaudal (CC) and mediolateral (ML) views) of the two breast images are taken. The images are used to detect signs of abnormalities and judge their severity: to differentiate benign and malignant cases. Mass and Microcalcifications are the two most important sign indicators of malignancy, and their automated detection is very valuable for early breast cancer diagnosis. It is very hard and fatigue task to detect the suspicious mammogram abnormalities (i.e. mass). Masses are very hard to differentiate from the surrounding tissues within the mammogram images because mass features can be denser, sharper, obscured or very similar to the breast tissues. Huge number of cases analyzed by a radiologist, only 4 to 5 are cancerous and the remaining could be missed or overlooked. Also reported that, radiologists missed to detect about 15 to 30% of cancers. The use of computer assisted mammogram diagnosis indeed help in reducing the errors however the involvement of radiologist is still high. Therefore main objective of this thesis is to enhance, detect and classify masses in MRI digital mammogram images by proposed best case classifier approach to improve the accuracy rate of mass detection compare to the existing works. In this thesis, there are four phases are undergone to acquire, detect, segment and classify the mass tumor in digital mammogram. First, image pre-processing of the digitized mammogram can suppress noise and improve the contrast of the image. Second, the image segmentation whereas the mass detection for locating the suspicious regions. In the third phase, extract the features of located mass by Haralick texture feature extraction for the stages of classification. The proposed classification for mass detection is based on Best Case Classifier method, where case-based classification algorithm is designed to support the decision to perform biopsy in those patients who have suspicious findings on diagnostic mammography. The best case classification system compares with the findings of extracted features from the database of cases with known results (from biopsy) and returns the fraction of similar cases that were malignant. Based on these findings, it would be very helpful for radiologist and doctors to make decisions regarding biopsy and it consumes time. The proposed Best Case classification will improve the performance accuracy of mammogram tumor detection and reduce the false positives in mammogram images.

Poster

Track: Enabling Technologies and Infrastructures

Detecting and Preventing Attacks Against Neighbor Discovery Protocol (NDP) Using Artificial Immune System

Nazrool Bin Omar

Abstract

Attacks against Neighbour Discovery Protocol (NDP) in Internet Protocol Version 6 (IPv6) are gaining more interest among hackers and crackers due to the increase of IPv6 deployment in many organizations as well as the availability of attacking tools in the public internet. It is an urgent need to detect and eliminate these attacks, thus Intrusion Detection and Prevention System (IDPS) is apparently suitable tool for this purpose as compared to other techniques such as traffic encryption and authentication in terms of extra computing time and cost as well as lack of support and compliance with the popular operating system. Detecting NDP related attacks solely based on signatures would not be very effective because they can be crafted with different patterns but with the same goal and also the fact that the development IPv6 still in infancy will introduce many more unknown attacks. Therefore this paper proposes an anomaly detection mechanism using immune-inspired algorithm namely negative selection with optimised recognition threshold parameter and algorithm for better detection performance.

Optimized Quality of Service for Real-time Wireless Multimedia Sensor Networks using Multipath Routing Approach

Mohammed ZakiHasan

Abstract

The introduction of multimedia sensor networks and the increasing interest in real-time applications have strictly constrained of quality of services (QoS) requirements. For example, the transmission of video streaming in a disaster-management setup requires careful handling to ensure that the end-to-end delay is within an acceptable range and the video is received properly without any distortion. Failure to transmit an event from the detected area to the sink occurs for many reasons, including limitations to the functionality of sensors, power consumption, and reliability. Therefore, the assurance of QoS requirements in real-time multimedia application has placed a new challenge in the design of a new routing mechanism in WMSN. A mathematical model proposed for a novel QoS routing-determination method that enables one to determine the optimal path that uses resources to provide appropriate sharing radio that satisfies the required QoS to support a wide range of communication-intensive real-time media for wireless sensor applications. The mathematical model uses mixed integer programming, which is based on the Lagrangian relaxation method, to define critical parameters to control the adaptive switching of hop-by-hop QoS routing protocols. By design, this approach performs a new routing method for traffic engineering that implements capacity provisioning based on partitioning of end-to-end QoS parameters. The ability to communicate is maximized by optimizing resource sharing which is accomplished by collecting the information between the source node and the next hop neighbor periodically in a wireless sensor network. The embedded criteria for each objective function related to the decision constraint are used to decide which path from source to sink will be selected. LINGO is used as the mathematical programming language to investigate the performance trade-offs between energy efficiency and QoS requirements. The simulation results show that, compared with existing algorithms, the new approach significantly improves the lifetime, energy consumption, and average end-to-end delay of the sensor node.

Enhanced Mobile Lightweight Medium Access Control Protocol for Multi-Hop Wireless Sensor Network

Amina Ahmed Modamed

Abstract

Challenges are frequently encountered during wireless sensor network (WSN) operations, including: energy-efficiency, hidden terminal problem, time slot synchronization duplication and reuse, and collision avoidance. The main challenge is the energy savings (energy-efficiency) in line with running all nodes from months to years on limited energy sources. Existing Wireless Sensor MAC protocols suffer from one or more of the above mentioned problems, especially; energy-efficiency in a multi-hop environment. Therefore, the main objective of this study is to enhance the existing mobile lightweight MAC Protocol data throughput and at the same time reduce the energy consumption within the multi-hop wireless sensor network. Nevertheless, there are limitations in the existing EML-MAC protocol, mainly due to the tradeoffs between energy consumption and time synchronization in a multi-hopping environment. A proposed clustering algorithm, GANGs is used to address these issues. It has been shown that a clustered architecture guarantees basic performance improvement in large Mobile Ad Hoc Network (MANET). The MAC protocol is further divided into Contention based intra-cluster communications, and EML-MAC slot based inter-cluster communication phases. The simulation result showed that giving cluster heads the responsibility of inter-cluster communications using the EML-MAC distributed time slot assignment algorithm, allows clusters to reuse available time slots and prevent collisions in multi-hop environments, with energy saving of around 23% compared with L-MAC and 19% compared with B-MAC protocols.

Protein Multiple Sequence Alignment

Aziz Nasser Boraik Ali

Abstract

In bioinformatics the alignment of multiple sequences (MSA) actually is a fundamental step for many sequence analysis methods, e.g. function prediction, modeling binding sites, pattern identification, phylogenetic tree estimation, sequence database searching and many others. Hence, the quality of the result from the multiple sequence alignment is the most important factor in sequence analyses accuracy. Including anchor points or specific positions into multiple sequence alignment to be aligned has been proved to be a good way to increase the quality of MSA. These specific positions can be assembled from the basis of multiple local sequence similarities. In this research, firstly we have proposed an efficient method that will detect anchor points as partial alignment columns which will be aligned for final output. We have used Shared Near Neighbors method to construct the anchor points. This method will compose multiple sequence protein alignments from local pair wise alignments by focusing on measurement similarity for more than two points where each amino acid in any protein sequences is represented as a point. We have improved this method to find more related anchor points by reducing amino acid alphabet. Secondly, we shall propose a method to build the final MSA. However, MSA is a NP-complete problem in the sense of any reasonable score function, where in this research the objective function it will be sum-of-pairs score (SPS). The challenging problem to build up the final output of MSA is how to find MSA that maximizes the score of SPS. Thus, an artificial bee colony method (ABC) for the MSA problem has been proposed. We have improved the ABC algorithm by using divide-and-conquer approach and including anchor points which produced from first proposed method in this research. Another improvement to our proposed method to build the final output of MSA by combining the previous ABC algorithm with a progressive alignment approach. We have tested the accuracy of our proposed methods in two benchmark databases for multiple alignments. We used the database BALiBASE 3.0 for global protein alignment and the databases IRMBASE 2.0 for local protein alignments. Firstly, the anchor points have been used as guide with an existed MSA method to evaluate the result. We used the anchor points with DIALIGN-TX method. The results showed 4-8% improvement in the six reference sets in BALiBASE 3.0 benchmark regarding to CS score compared to DIALIGN-TX. In addition, the proposed of anchor points method achieves the highest overall mean Q-score and CS scores comparing to other methods in IRMBASE 2.0 benchmark.

Track: Data to Knowledge

Automatic Target Recognition on Synthetic Aperture Radar Images Using K-Nearest Neighbor Random Subspace Ensembles

ZohaPourEbtehaj

Abstract

Automatic Target Recognition (ATR) is a challenging research area due to its wide applications and unsolved problems. The goal is to enable computers to automatically identify and recognize targets in a scene. It can be implemented on various types of images captured by different sensors. The focus of this thesis is ATR on Synthetic Aperture Radar (SAR) images. This thesis primarily investigates the use of Random Subspace (RS) ensembles on ATR system which classifies three types of targets of SAR images. In the proposed framework, first the targets are separated from the cluttered background by using histogram equalization, thresholding and morphological operations. Then, Principal Component Analysis (PCA) and Non-negative Matrix Factorization (NMF) algorithms extract the target features as a linear combination of basis images but with different qualities. Next, a combined feature description which contains the discriminatory information from PCA and NMF features is created to be fed into the classification stage. Finally in classification stage, RS ensembles with K-Nearest Neighbor (KNN) classifier as base learner discover the targets types. Experimental results carried out on benchmark Moving and Stationary Target Acquisition and Recognition (MSTAR) public dataset show the effectiveness of the proposed methodology. Comparisons are drawn in terms of Probability of Correct Classification (PCC) and confusion matrices to the performance of single KNN classifiers. The achieved results indicate that RS ensembles working on diverse and combined feature set outperformed single KNN classifier with the same feature set. Also the problem of estimating the parameters of the ensemble was investigated and was found that with a relative small dimensionality of feature subsets and a medium sized ensemble, improvement can be achieved and the method is superior to simple KNN classification.

Incorporating Expected Answer Type Into Deep Question Answer System for Non-Factoid Question

Muhammad Ikhsan bin Azizan

Abstract

Current open-domain Question Answering Systems (QAS) able to have a good compromise between intuitiveness and expressivity in large corpora. However, it's hardly applied to questions in short forms, ambiguous statements and non-factoid questions. Furthermore, the answers are not always explicitly mentioned in the corpus and many answers are implicitly contained and need to be deducted. To achieve it, question analysis must be able to determine the expected answer type and the content needed for the candidate answers. QAS currently are not able to fully answer open domain non-factoid questions and confused when the retrieved candidates are having the same or similar words as in the question but having different content meaning.

This research aims to answer non-factoid question in the deep web of data. Questions are restricted to non-factoid type and the corpus used is an open domain with multiple fields of disciplines. The method created determines the expected answer type to provide the information needed and extract pieces of knowledge found in the question. The pieces of knowledge found are used to find the candidate answers and their confidence level in the sources. Then the ranking method rank the candidate answers based on the evidence scoring method. The highest of the candidate answers are taken as pieces to be combined, construct and generate as the final answer.

Recognizing Partially Occluded Face: A Review

Badr Mohammed Omar Lahasan

Abstract

Face biometrics is a convenient alternative choice for developing a representative optimal biometric system. Since it has advantages, which might outdo the other biometrics such as it does not need a physical contact with the camera and the installation of advanced hardware. Performance of any face recognition system could be affected by occlusions such as sunglasses, hats, scarves, beards etc. The practice of facial occlusions amongst the community creates challenges to the performance of this system especially in video surveillance scenarios. This review clarifies different face recognition practices that laid foundations on the issue of partial occlusion problem where faces are masked to cheat the security system.

Clustering Students in a Knowledge Based Coalition Formation System based on Personality Traits and Group Cohesiveness

AzleenaMohdKassim

Abstract

A coalition formation system focuses to achieve an optimal group arrangement between agents; which can be a collection of computer systems, processes or even virtual presentation of human. Most coalition formation approach focus more on the structure and representation, often overlooking the knowledge embedded in the coalition formation systems. Human and social factors which are one important knowledge source and trigger are also not widely applied to coalition formation systems. In our research, our coalition formation system represent students as individual agent in a social network with social factors such as personality traits, demographic background and trust with other individuals. In this paper, we present the clustering methods of the students into optimal sets of groups based on their personality traits, specifically retrieved from a social studies test known as Big-Five personality test. Group cohesiveness will also be taken into account by evaluating the trust values among the individuals. The objective function for the clustering problem has been formulated based on these criteria to optimize the group distribution and tested on Random method and Particle Swarm Optimization method.

Reconstruction of 3D Faces from Single 2D images using Tikhonov Regularization and Texture Interpolation

Ashraf Y. A. Maghari

Abstract

The problem of 3D facial modeling remains as a partially solved problem in the field of computer vision in terms of the accuracy and speed of reconstruction algorithms. In this paper we present an approach for reconstructing the 3D face of an individual given the 2D face image, in which prior knowledge is acquired. Prior knowledge about object classes such as 3D faces can help to solve an ill-posed problem of reconstructing a complete 3D faces from single 2D images. We propose an extended Tikhonov regularization approach that uses 3D Morphable Model to estimate the 3D face shape from 2D feature points. The proposed approach also interpolates the input 2D texture with model texture and warped the interpolated texture to the reconstructed 3D face shape. For the texture warping, the 2D face deformation has been learned from the model texture using a set of facial landmarks. Thin Plate Spline (TPS) is used for transferring the deformation based on those facial landmarks. The experimental results justify the robustness of the proposed approach with respect to the reconstruction of realistic 3D faces.

Answering Question using Knowledge Accumulated from Online Community Question Answering Portal

Lee Jun Choi

Abstract

Online Community Question Answering (CQA) portals provide a platform for public to seek answer using the intelligent of the crowd. Such portal consists an enormous quantity of knowledge which are shared by public. In current research trend, researchers are trying to use these knowledge in answering new question through harvesting the best answers from one or more questions which are similar. However, these studies neglected the other answers which may also posted as important choice for user. This study aims to develop a new framework to Question Answering by obtain and summarize all the relevant answers from similar questions in CQA. This study intent to summarize all the candidate answers from selected CQA question using a new summarization methods which based on entity-relationship triplets. In this new framework, we will also propose a new method for identifying question intent. Question Intent refers to what the question is asking. The identification of question intent is crucial in this study as it will helps to identify the question with similar intention in the CQA portal and harvest the correct candidate answers from these questions. The new proposed components of the framework will be evaluated separately for their accuracy, while the entire framework will be evaluated based on the answer acceptance level based on human experts.

Spoken Documents Segmentation Problems

Zainab Ali Khalaf

Abstract

Processing spoken documents is challenging because of the word errors generated by the automatic speech recognition (ASR) process. Determining the boundaries of broadcast news stories is another obstacle to processing spoken documents. The lack of overt punctuation and formatting contributes to this problem. In order to retrieve information, the beginning and the end of the segments or paragraphs within a document must be determined. The process of determining the boundaries of the segments in the text is not an easy process. This study describes different levels of spoken document segmentation, approaches to recovering story boundary locations automatically.

Patch-based Multiple Sclerosis Lesions Detection InBrainMRI Using Relevance Vector Machine

AbolghasemHassanpour

Abstract

Multiple Sclerosis (MS) is a disease of central nervous system (CNS), whose symptoms include blurred vision to severe muscle weakness and degradation. Nowadays, magnetic resonance imaging (MRI) is increasingly used to better understand this disease and to quantify its evolution. Manual delineation of MS lesions in MR images by human expert is time consuming and subjective; therefore, automatic detection is sought as an alternative. In addition, the progression of the MS lesions shows considerable variability and MS lesions present temporal changes in shape, location, and area between patients and even for the same patient, which renders the automatic detection of MS lesions a challenging problem. In this dissertation, a supervised classification algorithm is proposed using relevance vector machine to discriminate between MS lesions and health tissues based on intensity and textural features. The first step is preprocessing that includes registration, removing non-brain tissues and correcting the intensity in homogeneity. The second step is MS lesions detection that includes feature extraction and tissues classification. Each image is divided into 64 patches. The features are extracted from each patch using GLCM technique. Each patch is classified into MS and Non-MS classes using RVM. Final step is post-processing to remove the false positives. The proposed approach which is tested with MRI data are obtained from USM hospital, Children Hospital Boston and University of North Carolina datasets. The T1-w and FLAIR MRI modalities are used in this research. At the end, the classification performance of the proposed approach was evaluated and compared with Support Vector Machine.

Language Identification of Code Switching Using Multi Structural Word Information

Yeong Yin Lai

Abstract

In this thesis, we will propose an automatic language identification approach for code switching sentences by using multi structural word information (MUWSI). The proposed approach was tested on code switching sentences, multilingual sentences and close languages. The main languages that used to test by proposed approach were Malay, English, Indonesian and Iban. The percentage of accuracy for proposed language identification approach further improved by combining the knowledge from different level in the sentence: syllable n-gram approach, word n-gram approach and grapheme n-gram approach achieves 96.36% in term of accuracy on the code switching sentences, 90.40% on the under-resourced languages and 99.07% on the multilingual test.

See What You Want, Feel What You See: The Affective-based Re-recommending Framework for Image-based Virtual Tour

AsmaHaneeAriffin

Abstract

Human decision making process can be assisted by recommender system that capable on matching the user profile with personalized-filtered recommendation, out of bundle of other choices that are also accessible and may confused the users. However, the decision may amend depends on certain contextual factors, for instance emotion changes. Therefore, the research involves a personalised image recommendation model using hybrid recommendation technique that will adapt its recommendation depends on users' emotion that may influenced decision-making process. The model is based on recommendation paradigms, which are focused on main elements of image recommendation, as this research plans to present the recommendation in form of image-based virtual tour. Therefore, the recommend framework named See What You Want, Feel What You See (SeeWYW, FeelWYS) is discussed, which considered hybrid recommendation technique to adapt with changeable human decision-making process. This initial plan will be narrowed to recommending visiting route through virtual museum by using image-based virtual tour as the interactive tool. It is hoped that this framework will guide our quest to incorporate all the positive elements, presented by the previous work, as well as from different recommendation technique that may expectantly produced good user feedback and better virtual navigation.

Track: Service Computing

Measuring User Satisfaction and Usability as Key Factor in Information System Success in Malaysian Public Sector Organization

MazlanMohdSappri

Abstract

Information System (IS) plays vital role as an anchor in organization to smoothen the business processes. In Malaysian public sector setting, IS are implemented at all department and organization and the question has arise; what is our state of IS currently in public sector organization? Is it success or failure? Continuous monitoring is not a guarantee the success of an IS, but more towards sustaining good IS services provided to IS users. The answer whether an IS is success or failure relies on IS users' hand since this group of people works directly with IS. This paper proposed an independent variables; user satisfaction to investigate relationship between the current state of IS in Malaysian public sector. This study also targeted operational level worker who using IS as sample. The results will measure satisfaction level among this IS group and more importantly underline new perspective to answer whether our IS in public sector organization success or failure? Yet, this study also will open new opportunities for those who wants to further investigate IS success in Malaysia context.

Investigating Determinants of Tourists' Intention and Association of Perceived Usefulness, Ease of Use, and Mobility in the Context of Mobile Tourism Guide

NuntipTrakulmaykee

Abstract

This study investigates the determinants of tourist intention and associations of perceived usefulness, perceived ease-of-use, and perceived mobility in the context of mobile tourism guide. As a result of a few previous research studies the association of these constructs, especially in the context of mobile tourism guide. The research model is developed based on technology acceptance model 2 and extended model with perceived mobility constructs. The study employs convenience sampling technique to collect data from international tourists at Suvarnabhumi Airport in Thailand. The study employed WarpPLS 3.0 to analyze the proposed model in terms of validity, reliability, and path coefficients. The results evidence perceived usefulness, perceived ease-of-use, and perceived mobility are the determinants of tourists' intention to use mobile tourism guide in all traveler types. Even though, perceived ease-of-use is not the determinant of intention for both self-managed tour and package tour. In addition, the study supports the technology acceptance model 2 in terms of association of perceived ease-of-use and perceived usefulness. Furthermore, the findings also reveal the association of perceived mobility and perceived ease-of-use, and evidence the association of perceived mobility and perceived usefulness in intention model. The findings of study extend the body of knowledge in the context of mobile application and contribute the tourism industries to understand the tourists' perception on mobile application.

Inconsistency Detection Methodology for Eliciting Tacit Knowledge through a Question-Answering Mechanism

Lim Chia Yean

Abstract

The right decision today could be a wrong decision tomorrow, and vice-versa. In this circumstance, a decision is mainly characterized by the hidden reasons or tacit knowledge behind it. While most of the current tacit knowledge elicitation methods are inefficient due to the lacking of knowledge acquisition support, this research proposed a different way of thinking for collecting tacit knowledge from the experts through an online question-answering mechanism. In this research, tacit knowledge is defined along the line of knowledge that is not stored in the conscious minds of the experts. Five (5) inconsistency detection methods have been proposed through an exploration of four (4) conditional elements of logical rules, question generation, triad generation, and response analysis under some eleven consideration factors to support different stakeholders' needs in tacit knowledge elicitation. Through the exploration of the inconsistent instances of pair-wise criteria comparisons, tacit knowledge could be elicited when the experts recall, internalize, and then externalize their past experience and learning in various contexts and provide reasons to agree/disagree upon a criteria comparison preference during inconsistency detection and correction stage. It is hoped that this new way of thinking for collecting useful tacit knowledge could assist organizations to transform into knowledge organizations through the maintenance of organizational memories behind crucial decisions.

Hybrid and Blind Steganographic Method for Digital Images Based on DWT

SamerAtawneh

Abstract

Steganography is the art and science of hiding secret information into digital media with the intention to transmit this information. Most of the steganographic methods either use spatial domain or frequency domain for embedding the secret information. Current hybrid methods require the original cover image to extract the secret information making these methods to become not practical. This paper proposes a new blind steganographic method for digital images that combines spatial and frequency domains and does not rely on the cover image in extracting the secret information. The proposed method utilizes a chaotic map to scramble the secret information before the embedding procedure takes place. A coding map is generated during the work on spatial domain, and the original image is transformed into DWT domain, then the generated coding map is embedded in the coefficients of LL and HL sub-bands of the cover image. The drawn experimental results show that the resultant stego-images have high quality and the proposed method provides high embedding capacity compared with other methods and is robust against the visual analysis and other image processing attacks such as lossy compression and added noise.

E-commerce Adoption among Small-Medium Enterprises: Case Study Jordan

Lubna Abdul Hussein SarhanFatlawi

Abstract

The internet and e-commerce can extend market reach and operational efficiency of Small-medium enterprises (SMEs) and enhance their contribution in Jordanian economy. The study investigates obstacles that affect e-commerce adoption among SMEs. This study tries to develop SMEs, because it plays an important role 98% of Jordanian economy. Many of these obstacles that prevent e-commerce adoption are trust, government support, online payment, and so on. In this study use Technological, organizational, environmental framework (TOE) within innovation theory to present obstacles as factors to adopt e-commerce application. SMEs need not create a new method but adopting the methods to make it beneficial to their specific operation.

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Acknowledgement

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