SC2 2016 TECHNICAL PROGRAM

THE 6TH IEEE INTERNATIONAL SYMPOSIUM ON CLOUD AND SERVICE COMPUTING
SHANGRI-LA’S FUJIAN RESORT AND SPA, FUJI
7-10 DECEMBER 2016
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OVERVIEW
KEYNOTE 1 ROBUST ALLOCATION OF RESOURCES TO ENHANCE SYSTEM PERFORMANCE

Thursday, 8 December 2016, 09:15 - 10:00
Ratu Makutu Event Center

SPEAKER: PROFESSOR H. J. SIEGEL, COLORADO STATE UNIVERSITY, USA

ABSTRACT
Throughout all fields of science and engineering, it is important that resources are allocated so that systems are robust against uncertainty. The robustness analysis approach presented here can be adapted to a variety of computing, communication, and information technology environments, such as high performance computing, clouds, grids, internet of vehicles, big data, security, embedded, multicore, content distribution, wireless, and sensor networks.

What does it mean for a system to be “robust”? How can the performance of a system be robust against uncertainty? How can robustness be described? How does one determine if a claim of robustness is true? How can one decide which of two systems is more robust? We explore these general questions in the context of parallel and distributed computing systems. Such computing systems are often heterogeneous mixtures of machines, used to execute collections of tasks with diverse computational requirements. A critical research problem is how to allocate heterogeneous resources to tasks to optimize some performance objective. However, systems frequently have degraded performance due to uncertainties, such as inaccurate estimates of actual workload parameters. To avoid this degradation, we present a model for deriving the robustness of a resource allocation. The robustness of a resource allocation is quantified as the probability that a user-specified level of system performance can be met. We show how to use historical data to build a probabilistic model to evaluate the robustness of resource assignments and to design resource management techniques that produce robust allocations.

BIOGRAPHY OF SPEAKER
H. J. Siegel is the George T. Abell Endowed Chair Distinguished Professor of Electrical and Computer Engineering at Colorado State University (CSU), where he is also a Professor of Computer Science. Before joining CSU, he was a professor at Purdue University from 1976 to 2001. He received two B.S. degrees from the Massachusetts Institute of Technology (MIT), and the M.A., M.S.E., and Ph.D. degrees from Princeton University. He is a Fellow of the IEEE and a Fellow of the ACM. Prof. Siegel has co-authored over 440 published technical papers in the areas of parallel and distributed computing and communications, which have been cited over 15,000 times. He was a Coeditor-in-Chief of the Journal of Parallel and Distributed Computing, and was on the Editorial Boards of the IEEE Transactions on Parallel and Distributed Systems and the IEEE Transactions on Computers. For more information, please see http://www.engr.colostate.edu/~hj.
KEYNOTE 2 COMPUTATIONAL SOCIAL SCIENCE MEETS BIG DATA

Thursday, 8 December 2016, 10:00 - 10:45
Ratu Makutu Event Center

SPEAKER: PROFESSOR FENG XIA, DALIAN UNIVERSITY OF TECHNOLOGY, CHINA

ABSTRACT
We are entering the new era of big data. With the widespread deployment of various data collection tools and systems, the amount of data that we can access and process is increasing at an unprecedented speed far from what we could imagine even a decade ago. This is happening in almost all domains in the world, including e.g. healthcare, research, finance, transportation, and education. In particular, the availability of big data has created new opportunities for transforming how we study social science phenomena. Data-driven computational social science emerges as a result of the integration of computer science and social sciences, which has been attracting more and more attentions from both academia and industry. This talk will present an overview of the computational social science in the era of big data. Special attention will be given to newly emerging topics like how to explore big data to understand human dynamics. Recent advances in the field will be introduced. Opportunities and challenges will also be discussed.

BIOGRAPHY OF SPEAKER
Dr Feng Xia is currently Full Professor in Dalian University of Technology (DUT), China. He is Head of Department of Cyber Engineering and Assistant Dean of School of Software. He is the (Guest) Editor of over 10 international journals and a (founding) organizer of several conferences. He serves as General Chair, PC Chair, Workshop Chair, Publicity Chair, or PC Member of dozens of conferences. Dr Xia has authored/co-authored two books, over 200 scientific papers in int’l journals and conferences (such as IEEE TMC, TBB, TCSS, TC, TPDS, TETC, THMS, TVT, TIE, ACM TOMM, WWW, JCDL, and MobiCom) and 2 book chapters, and has edited 3 int’l conference proceedings and 4 books. He has an h-index of 26, an i10-index of 84, and a total of more than 2900 citations to his work according to Google Scholar. Dr Xia received a number of awards. He is named on the 2014 list and the 2015 list of Most Cited Chinese Researchers (published by Elsevier). He is a Senior Member of IEEE (Computer Society, SMC Society) and ACM (SIGWEB), and a Member of AAAS.
KEYNOTE 3 SEARCHABLE SYMMETRIC ENCRYPTION: POTENTIAL ATTACKS, PRACTICAL CONSTRUCTIONS AND EXTENSIONS

Thursday, 8 December 2016, 14:15 - 15:00
Ratu Makutu Event Center

SPEAKER: PROFESSOR JINJUN CHEN, UNIVERSITY OF TECHNOLOGY SYDNEY, AUSTRALIA

ABSTRACT
Data outsourcing has become one of the most successful applications of cloud computing, as it significantly reduces data owners' costs on data storage and management. To prevent privacy disclosure, sensitive data has to be encrypted before outsourcing. Traditional encryption tools such as AES, however, destroy the data searchability because keyword searches cannot be performed over encrypted data. Though the above issue has been addressed by an advanced cryptographic primitive, called searchable symmetric encryption (SSE), we observe that existing SSE schemes still suffer security, efficiency or functionality flaws. In this research, we further study SSE on three aspects. Firstly, we address the search pattern leakage issue. We demonstrate that potential attacks are exist as long as an adversary with some background knowledge learns users' search pattern. We then develop a general countermeasure to transform an existing SSE scheme to a new scheme where the search pattern is hidden. Secondly, motivated by the practical phenomenon in data outsourcing scenarios that user data is distributed over multiple data sources, we propose efficient SSE constructions which allow each data source to build a local index individually and enable the storage provider to merge all local indexes into a global one. Thirdly, we extend SSE into graph encryption with support for specific graph queries. E.g., we investigate how to perform shortest distance queries on an encrypted graph.

BIOGRAPHY OF SPEAKER
Dr Jinjun Chen is a Professor from Faculty of Engineering and IT, University of Technology Sydney (UTS), Australia. He is the Director of Lab for Data Systems and Visual Analytics in the Global Big Data Technologies Centre at UTS. He holds a PhD in Information Technology from Swinburne University of Technology, Australia. His research interests include scalability, big data, data science, data intensive systems, cloud computing, workflow management, privacy and security, and related various research topics. His research results have been published in more than 130 papers in international journals and conferences, including ACM Transactions on Software Engineering and Methodology (TOSEM), IEEE Transactions on Software Engineering (TSE), IEEE Transactions on Parallel and Distributed Systems (TPDS), IEEE Transactions on Cloud Computing, IEEE Transactions on Computers (TC), IEEE Transactions on Service Computing, and IEEE TKDE.

He received UTS Vice-Chancellor's Awards for Research Excellence Highly Commended (2014), UTS Vice-Chancellor’s Awards for Research Excellence Finalist (2013), Swinburne Vice-Chancellor’s Research Award (ECR) (2008), IEEE Computer Society Outstanding Leadership Award (2008-2009) and (2010-2011), IEEE Computer Society Service Award (2007), Swinburne Faculty of ICT Research Thesis Excellence Award (2007). He is an Associate Editor for ACM Computing Surveys, IEEE Transactions on Big Data, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Cloud Computing, as well as other journals such as Journal of Computer and System Sciences, JNCA. He is the Chair of IEEE Computer Society’s Technical Committee on Scalable Computing (TCSC), Vice Chair of Steering Committee of Australasian Symposium on Parallel and Distributed Computing, Founder and Coordinator of IEEE TCSC Technical Area on Big Data and MapReduce, Founder and Steering Committee Co-Chair of IEEE International Conference on Big Data and Cloud Computing, IEEE International Conference on Big Data Science and Engineering, and IEEE International Conference on Data Science and Systems.
KEYNOTE 4 URBAN SENSING: MAKING SMART CITIES FRIENDLY AND SAFE TO PEDESTRIANS

Friday, 9 December 2016, 08:30 - 09:15
Ratu Makutu Event Center

SPEAKER: PROFESSOR KWEI-JAY LIN, UNIVERSITY OF CALIFORNIA, IRVINE, USA, NTU IOX CENTER, TAIWAN, AND NAGOYA INSTITUTE OF TECHNOLOGY, JAPAN

ABSTRACT
Most of the world’s population now live in big cities. As cities grow bigger, there are bound to be dark corners. Local people who are familiar with an area would avoid using certain side streets unless they have no other choice. However, for tourists from out of town and those who must work in the area, a smart pedestrian GPS with “urban sensors” would be very useful to guide people move around in the area. We study urban sensors that can identify specific types of people, events, and situations on city streets to build real-time pedestrian guiding systems. For example, homeless and drunk people may be detected and traced by street cameras that are now ubiquitous in all cities. Occasional accidents, fire or natural disasters may also be detected by urban sensors built from social or crowd sensing to mark certain areas too dangerous to use. Algorithms and techniques can be integrated for real time detection of urban events and situations. Combined with historical data analytics, urban sensing may make predictions on the perimeter of areas for people to avoid. In this talk, the issues, techniques and challenges for urban sensing are presented.

BIOGRAPHY OF SPEAKER
Kwei-Jay Lin is a Professor at the University of California, Irvine. He is an Adjunct Professor at the National Taiwan University and National Tsinghua University, Taiwan; Zhejiang University, China; Nagoya Institute of Technology, Japan. He is a Chief Scientist at the NTU IoX Research Center at the National Taiwan University, Taipei. He was a Visiting Research Fellow at the Academia Sinica, Taiwan in Spring 2016.

Prof. Lin is an IEEE Fellow, and Editor-In- Chief of the Springer Journal on Service-Oriented Computing and Applications (SOCA). He was the Co-Chair of the IEEE Technical Committee on Business Informatics and Systems (TCBIS) until 2012. He has served on many international conferences, recently as conference co-chairs of IEEE SOCA 2016. His research interest includes service-oriented systems, IoT systems, middleware, real-time computing, and distributed computing.
KEYNOTE 5 RECOMMENDATIONS BASED ON OFFLINE DATA PROCESSING: TECHNIQUES, FEATURES, AND CHALLENGES

Friday, 9 December 2016, 14:15 - 15:00
Ratu Makutu Event Center

SPEAKER: PROFESSOR WANLEI ZHOU, DEAKIN UNIVERSITY, AUSTRALIA

ABSTRACT

Recommendations based on off-line data processing has attracted increasing attention from both research communities and IT industries. The recommendation techniques could be used to explore huge volumes of data, identify the items that users probably like, and translate the research results into real-world applications and so on. This talk surveys the recent progress in the research of recommendation techniques based on off-line data processing, with emphasis on new techniques (such as temporal recommendation, graph-based recommendation and trust-based recommendation), new features (such as serendipitous recommendation), and new research issues (such as tag recommendation, group recommendation, privacy-preserving recommendation). We also provide an extensive review of evaluation measurements, benchmark datasets, and available open source tools. Finally, we present our recent work on recommendation techniques and outline some existing challenges for future research. The talk will be based on the following papers:


BIOGRAPHY OF SPEAKER

Professor Wanlei Zhou received the B.Eng and M.Eng degrees from Harbin Institute of Technology, Harbin, China in 1982 and 1984, respectively, and the PhD degree from The Australian National University, Canberra, Australia, in 1991, all in Computer Science and Engineering. He also received a DSc degree (a higher Doctorate degree) from Deakin University in 2002. He is currently the Alfred Deakin Professor (the highest honour the University can bestow on a member of academic staff) and Chair Professor in Information Technology, School of Information Technology, Deakin University. Professor Zhou has been the Head of School of Information Technology twice (Jan 2002-Apr 2006 and Jan 2009-Jan 2015) and Associate Dean of Faculty of Science and Technology in Deakin University (May 2006-Dec 2008). Before joining Deakin University, Professor Zhou served as a lecturer in University of Electronic Science and Technology of China, a system programmer in HP at Massachusetts, USA; a lecturer in Monash University, Melbourne, Australia; and a lecturer in National University of Singapore, Singapore. His research interests include distributed systems, network security, bioinformatics, and e-learning. Professor Zhou has published more than 300 papers in refereed international journals and refereed international conferences proceedings. He has also chaired many international conferences. Prof Zhou is a Senior Member of the IEEE.
KEYNOTE 6 ADVANCED TECHNIQUES ON SEARCHABLE ENCRYPTION

Saturday, 10 December 2016, 14:15 - 15:00
Ratu Makutu Event Center

SPEAKER: DR JOSEPH LIU, MONASH UNIVERSITY, AUSTRALIA

ABSTRACT
Searchable Encryption allows the data owner to search for some keywords (Boolean query) or a numeric value (range query) within the encrypted domain. The recent protocol proposed by Cash et al (CASH) established the state-of-the-art searchable symmetric encryption (SSE). Yet there are still many interesting extensions or improvements over the CASH protocol. In this talk, we first give an overview of the CASH protocol. Then we provide an extensive review of some interesting extensions, such as multi-client search and range search based on the original CASH protocol. Finally, we present our recent work on non-interactive multi-client search and discuss some possible future research directions on this area.

BIOGRAPHY OF SPEAKER
Dr Joseph Liu received the Ph.D. degree in Information Engineering from the Chinese University of Hong Kong (CUHK) in July 2004, specializing in cyber security, protocols for securing wireless networks, privacy, authentication, and provable security. He is now a senior lecturer at Faculty of Information Technology, Monash University, Australia. Prior to that, he was a Research Scientist at Infocomm Security Department, Institute for Infocomm Research (I2R) in Singapore for more than 7 years. His current technical focus is particularly applied cryptography and cyber security in the cloud computing paradigm, big data, lightweight security, and privacy enhanced technology. He has published more than 120 referred journal and conference papers and received the Best Paper Award from ESORICS 2014 and ESORICS 2015. He is the co-founder of ProvSec (International Conference on Provable Security). He has served as the program chair of ProvSec 2007, 2014 ACISP 2016, and as the program committee of more than 50 international conferences.
SESSION 1 NETWORKING & FAULT TOLERANCE
Thursday, 8 December 2016, 11:15 - 13:15
Room: Ratu Makutu 2
Session Chair: Carson K. Leung, University of Manitoba, Canada

A Performance and Energy Comparison of Fault Tolerance Techniques for Exascale Computing Systems
Daniel Dauwe, Sudeep Pasricha, Anthony A. Maciejewski, Howard Jay Siegel

Peer-Assisted Streaming Distribution over CCN
Meilian Lu, Danhua Sun, Yan Shi, Yuhong Li

Community Detection in Location-based Social Networks: An Entropy-based Approach
Jiahao Liu, You Li, Guohui Ling, Ronghua Li, Zibin Zheng

Privacy-Enhanced Scheduling for Smart Power Grids
Philander Adriaan, Yan Bai, Donald Chinn

Distributed content dissemination with a rank function
Anna Kobusinska, Jerzy Brzezinski, Jakub Aftowicz, Grzegorz Grzelachowski

An Android Malware Detection Approach Using Bayesian Inference
Che-Hsun Liu, Zhi-Jie Zhang, Sheng-De Wang

SESSION 2 SCHEDULING & PERFORMANCE
Thursday, December 8, 2016, 15:30 - 17:30
Room: Ratu Makutu 2
Session Chair: Sheng-Lung Peng, National Dong Hua University, Taiwan

Knowledge discovery from big social key-value data
Carson K. Leung, Peter Braun, Murun Enkhee, Adam G.M. Pazdor, Oluwafemi A. Sarumi, Kimberly Tran

Supporting Edge Intelligence in Service-Oriented Smart IoT Applications
Zhenqiu Huang, Kwei-Jay Lin, Chi-Sheng Shih

Accuracy Improvement for Backup Tasks in Hadoop Speculative Algorithm
Worachate Apichanukul, Jun Kawahara, Shoji Kasahara

CIDS: Adapting Legacy Intrusion Detection Systems to the Cloud with Hybrid Sampling
Qingtang Xia, Tianjia Chen, Wei Xu

Cloud-assisted Dynamic Content Sharing among Vehicles
Yoshiaki Adachi, Hirozumi Yamaguchi, Teruo Higashino, Takaaki Umedu

A Traceable Signcryption Scheme for Secure Sharing of Data in Cloud Storage
Rohit Ahuja, Srban Kumar Mohanty, Kouichi Sakurai
SESSION 3 SERVICE & RESOURCE MANAGEMENT
Friday, 9 December 2016, 9:15 – 10:45
Room: Ratu Makutu 2
Session Chair: Christophe Cerin, Universite de Paris 13, France

A Scalable Integrated SDN and OpenStack Management System
Sing-Chi Chen, Ren-Hung Hwang

A highly reliable storage based on SSD array for cloud computing environment
HooYoung Ahn, Junsu Kim, YoonJoon Lee

G-KVM: A Full GPU Virtualization on KVM
Hong-Cyuan Hsu, Che-Rung Lee

Lightweight Feature Selection Methods Based on Standardized Measure of Dispersion for Mining Big Data
Simon Fong, Robert P. Biuk-Aghai, Yain-Whar Si

SESSION 4 DATA ANALYTICS
Friday, 9 December 2016, 11:15 – 13:15
Room: Ratu Makutu 2
Session Chair: Rajesh Palit, North South University, Dhaka

Fostering Collaborative Edge Service Provision in Community Clouds with Docker
Roger Baig, Felix Freitag, Leandro Navarro

Energy Aware Resource Management for MapReduce Jobs with Service Level Agreements in Cloud Data Centers
Adam Gregory, Shikharesh Majumdar

A Novel Storage Architecture for facilitating Efficient Analytics of Health Informatics Big Data in Cloud
Manish Kumar Pandey, Subbiah Karthikeyan

The major research themes of big data literature: From 2001 to 2016
Louis Y. Y. Lu, John S. Liu

A Data Backup Algorithm Based on Failure Correlation in In-memory Storage System
Jianhua Gu, Xiaodong Dong

Data Management for the RedisDG Scientific Workflow Engine
Leila Abidi, Souha Bejaoui, Christophe Cerin, Jonathan Lejeune, Yanik Ngoko, Walid Saad
POSTER SESSION
Friday, 9 December 2016, 15:30 – 17:30
Room: Kalevu Verandah
Session Chair: Felix Freitag, Technical University of Catalunya, Spain

ModelX: Using Model Checking to Find Design Errors of Cloud Applications
Tian Tian, Yiming Zhang, Qiao Zhou, Ping Zhong

Helmet Wearing Detection in Thailand using Haar Like Feature and Circle Hough Transform on Image Processing
Katanyoo Klubsuwan

Intruder Detection Using Deep Learning and Association Rule Mining
Asantha Thilina, Shakti Attanayake, Sacith Samarakoon, Dahami Nawodya, Lakmal Rupasinghe, Nadith Pathirage, Tharindu Edirisinghe, Kesavan Krishnadeva

Inter-Organizational Middleware System Implementations: Do’s and Don’t of Business Integration
Radhouane B N Jrad, David Sundaram

Design and Development of a Mobile Application Based Drug Requisition System
A.T.M. Mosharof Hossain, Nazia Hasan Tuktuki, Hasibul Kabir, Rajesh Palit

CitizenConnect: Connecting Citizens with Public Service Providers
Mohammad Adnan Shahriar, Sadman Sakib, Rajesh Palit

A Reference Architecture for the Logistics Service Map
Michael Glöckner, André Ludwig, Bogdan Franczyk

A Virtual Cluster Resource Scheduling Method Based on Importance
Cunqun Fan, Xiangang Zhao, Manyun Lin, Lan Wei, Zhanyun Zhang, Xi Zhang, You Ma

Heterogeneous and homogeneous samples with Different Weights For Classification
Baoping Zou

Byzantine Fault Tolerant Optimization in Federated Cloud computing
Hojjat Baghban, Mahdis Moradi, Ching-Hsien Hsu, Jerry Chou, Yeh-Ching Chung

Supervised Learning Based Approach to Aspect Based Sentiment Analysis
Nipuna Uspeka Pannala, Chamira Priyamanthi Nawarathna, J.T.K. Jayakody, Lakmal Rupasinghe, Kesavan Krishnadeva
SESSION 5 SERVICES & CLOUD APPLICATIONS
Saturday, 10 December 2016, 8:45 – 10:45
Room: Ratu Makutu 2
Session Chair: Shikharesh Majumdar, Carleton University, Canada

Performance Comparison on the Heterogeneous File System in Cloud Storage Systems
Wei-Peng Chen, Chuan-Ming Liu

A Novel Method for Designing Information Technology Services
Yi-Chih Kao, Yung-Chia Chang, Sheng-Lung Peng, Ruay-Shiuang Chang

A Risk Evaluation Framework for Service Level Agreements
Babak Yadranjiaagham, Komal Hotwani, Nasseh Tabrizi

Predictive Dynamic Algorithm: An Approach toward QoS-aware service for IoT-Cloud Environment
Maycon Peixoto, Dionisio Leite, Carlos Henrique, Danilo Segura, Bruno Tardiole, Bruno Guazzelli

Kezhi Wang, Kun Yang

Constructing PM2.5 Map based on Mobile PM2.5 Sensor and Cloud platform
Yung-Sheng Lin, Yu-Hsiang Chang, Yue-Shan Chang

SESSION 6 PRIVACY & SECURITY
Saturday, 10 December 2016, 11:15 – 13:15
Room: Ratu Makutu 2
Session Chair: Jinlei Jiang, Tsinghua University, China

RNN-based Personalized Activity Recognition in Multi-person Environment using RFID
Sungpil Woo, Jaewook Byun, Seonhoon Kim, Hoang Minh Nguyen, Janggwan Im, Daeyoung Kim

Cloud Based Privacy Preserving Collaborative Business Process Management
Björn Schwarzbach, Bogdan Franczyk, Lucas Petrich, Arkadius Schier, Michael ten Hompel

Considerations of Emerging Cloud Computing in Financial Industry and One-Time Password with Valet Key Solution
Te-Yuan Lin, Chiou-Shann Fuh

E-commerce (WEB) Application security: Defense against Reconnaissance
Ashan Chulanga Perera, Krishnadeva Kesavan, Sripa Vimukthi Bannakkotuwa, Chethana Liyanapathirana, Lakmal Rupasinghe

FoTSeC - Human Security in Fog of Things
David Nunes, Jorge Sa Silva, Ashley Figueira, Soraya Sinche, Hugo Dias, André Rodrigues, Vasco Pereira, Fernando Boavida

Novel survey on the color-image graying algorithm
Xiaoqiang Zhang, Xuesong Wang
SESSION 7 VIRTUALIZATION

Saturday, 10 December 2016, 15:30 – 17:00
Room: Ratu Makutu 2
Session Chair: Anna Kobusinska, Poznan University of Technology, Poland

Research on Improved 2D-BPSO-based VM-Container Hybrid Hierarchical Cloud Resource Scheduling Mechanism
Chunxiao Fan, Yeqiao Wang, Zhigang Wen

I/O-Conscious and Prediction-Enabled Virtual Machines Scheduling
Jinlei Jiang, Xun Zhao, Yongwei Wu, Weimin Zheng

Hypervisor Assisted Forensics and Incident Response in the Cloud
Vincent E. Urias, William M.S. Stout, Caleb Loverro, John W. Young

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