Message from the Conference Chair

Welcome to ICIS 2009. Welcome to Shanghai, China.

The 8th International Conference on Computer and Information Science (ICIS 2009) is sponsored by the Institute of Electrical and Electronics Engineers (IEEE) and the International Association for Computer and Information Science (ACIS), in cooperation with Central Michigan University, USA, and Shanghai University, China. It is also supported in part by the National Natural Science Foundation of China. The conference is hosted by Shanghai University.

The purpose of ICIS is to bring together researchers and practitioners from academia, industry, and government to exchange their research ideas and results and to discuss the state of the art in the areas of the conference. In addition, the participants of the conference will have a chance to hear from renowned keynote speakers Professor Jifeng He of East China Normal University and Dr. Paul Tyma of ManyBrain, Inc., USA, as well as the Invited Speaker Dr. Jixin Ma of the University of Greenwich, UK.

I would like to thank the Program Chair Dr. Huaikou Maio, the organization staff, and the members of the Program Committee for their hard work. And most importantly, I would like to thank all the authors for sharing their ideas and experiences through their outstanding papers contributed to the conference. I hope that ICIS 2009 will be successful and enjoyable to all participants.

Gongzhu Hu
Conference Chair, ICIS 2009
June 2009
Message from the Program Chairs

Welcome to the 8th IEEE/ACIS International Conference on Computer and Information Science (ICIS 2009), sponsored by IEEE and the International Association for Computers and Information Science (ACIS), in cooperation with Shanghai University in China, and supported by the National Natural Science Foundation of China. This conference provides an international forum for researchers, scientists, engineers, industry practitioners, and students throughout the world to share their experiences, new ideas, and research results about all aspects of computer and information science.

The conference received a total submission of 585 papers from 37 different countries/regions. These papers are refereed by close to 150 Program Committee Members and secondary reviewers from more than 20 different countries. After careful review, 205 papers were selected to be presented at the conference and published in the conference proceedings. These papers cover a wide range of topics including theory, methods, and applications.

I would like to express my appreciation to the following people: the conference chair, Dr. Gongzhu Hu who supervised and personally contributed to every step including paper review and session organization; keynote speakers Professor Jifeng He of East China Normal University and Dr. Paul Tyma, President and CTO of ManyBrain, Inc., USA; invited speaker Dr. Jixin Ma of University of Greenwich, UK; the members of the Program Committee and secondary reviewers who contributed a great amount of their time to evaluate the submissions to maintain high quality of the conference; the publicity co-chairs, Feng Gao of Qingdao Technological University, China and Hongwei Zeng of Shanghai University, China; the session chairs who presided over the sessions; and all the authors, attendees, and presenters who really made this conference possible and successful.

We hope you enjoy the conference and enjoy your stay in Shanghai, China!

Huaikou Miao
Program Chair
June 2009
Program Committee and Reviewers

Alberto Sillitti, Free University of Bozen-Bolzano, Italy
Andy Connor, Auckland University of Technology, New Zealand
Anthony Chung, DePaul University, USA
Aoying Zhou, East China Normal University, China
Arndt Bode, Technical University München, Germany
Atif Memon, University of Maryland, USA
Atul Sajjanhar, Deakin University, Australia
Bai Xiao, University of Bath, United Kingdom
Baowen Xu, Southeast University, China
Bixin Li, Southeast University, China
Bofeng Zhang, Shanghai University, China
Caiming Zhang, Shandong University, China
Carson K. Leung, The University of Manitoba, Canada
Changjun Jiang, Tongji University, China
Chia-Chu Chiang, University of Arkansas, USA
Chih-Cheng Hung, Southern Polytechnic State University, USA
Chongyu Wei, Qingdao University of Science and Technology, China
Chung Le, RD3 Software Corporation, USA
Chunxiao Xing, Tsinghua University, China
Cui Zhang, California State University Sacramento, USA
Dae-Kyoo Kim, Oakland University, USA
Dongwon Jeong, Korea University, Korea
Dunren Che, Southern Illinois University, USA
Duoqian Miao, Tongji University, China
Elena Navarro, University of Castilla-La Mancha, Spain
Emanuel Grant, University of North Dakota, USA
Eric Wong, The University of Texas at Dallas, USA
Farong Zhong, Zhejiang Normal University, China
Feng Gao, Qingdao Technological University, China
Feng Qin, The Ohio State University, USA
Filippos Azariadis, University of the Aegean, Greece
Gang Li, Deakin University, Australia
Geng Yang, Nanjing University of Posts and Telecommunications, China
Golam Sorwar, Southern Cross University, Australia
Gongzhu Hu, Central Michigan University, USA
Guangzhi Qu, Oakland University, USA
Guangzhong Liu, Shanghai Maritime University, China
Guihai Chen, Nanjing University, China
Guoyin Wang, Chongqing University of Posts and Telecommunications, China
Guozheng Li, Shanghai University, China
Hai Wang, University of Southampton, United Kingdom
Haibin Kan, Fudan University, China
Hamid Abachi, Monash University, Australia
Hongbin Zha, Peking University, China
Hongen Lu, La Trobe University, Australia
Hongwei Zeng, Shanghai University, China
Huadong Ma, Beijing University of Posts and Telecommunications, China
Huaikou Miao, Shanghai University, China
Hui Liu, Qingdao Technological University, China
Hui Liu, Beijing Institute of Technology, China
Huiqun Yu, East China University of Science and Technology, China
Jemal H. Abawajy, Deakin University, Australia
Jia Xu, York University, Canada
Jianjun Zhao, Shanghai Jiao Tong University, China
Jianwei Niu, University of Texas San Antonio, USA
Jie Li, University of Tsukuba, Japan
Jingzhou Zhang, Shanghai Key Laboratory of Computer Software Evaluating and Testing, China
Jing Liu, East China Normal University, China
Jingsong He, University of Science and Technology of China, China
Jinhe Wang, Qingdao Technological University, China
Jinyun Xue, Jiangxi Normal University, China
John Zhang, University of Lethbridge, Canada
Jongmoon Baik, Information and Communications University, Korea
JoseManuel Molina López, Universidad Carlos III de Madrid, Spain
Juhnyoung Lee, IBM T.J. Watson Research Center, USA
Jun Sun, National University of Singapore, Singapore
Jun Yan, Institute of Software Chinese Academy of Sciences, China
Junping Sun, Nova Southeastern University, USA
Kendra Cooper, University of Texas at Dallas, USA
Keqing He, Wuhan University, China
Keqiu Li, Dalian University of Technology, China
Kiumi Akingbehin, University of Michigan, USA
Lawrence Chung, University of Texas at Dallas, USA
Lingpeng Huang, Shanghai Jiao Tong University, China
Li-Yan Yuan, University of Alberta, Canada
Lizhi Cai, Shanghai Key Laboratory of Computer Software Evaluating and Testing, China
Luis Carrico, University of Lisbon, Portugal
Marcus Vinicius dos Santos, Ryerson University, Canada
Nalin Sharda, Victoria University, Australia
Nasrullah Memon, Aalborg University Esbjerg, Denmark
Patrick Kinnicutt, Central Michigan University, USA
Paul Garratt, University of Southampton, UK
Philip Ogunbona, University of Wollongong, Australia
Polychronis Koutsakis, McMaster University, Canada
Prabhat K. Mahanti, University of New Brunswick, Canada
Qiying Cao, Donghua University, China
Qun Jin, Waseda University, Japan
Rafiqul Islam, Deakin University, Australia
Razibul Islam, Macquarie University, Australia
Ricardo Campos, The Polytechnic of Tomar, Portugal
Ruhul Sarker, Australian Defence Force Academy, Australia
Sabine McConnell, Trent University, Canada
Saif Zahir, University of Northern British Columbia, Canada
Sam Supakkul, University of Texas at Dallas, USA
Sen Zhang, Beijing University of Technology, China
Shamsul Huda, School of Information Technology & Mathematical Sciences, Australia
Shaoying Liu, Hosei University, Japan
Shawkat Ali, Central Queensland University, Australia
Shengchao Qin, Durham University, United Kingdom
Shi Ying, Wuhan University, China
Shin-Jer Yang, Soochow University, Taiwan
Shu-Ching Chen, Florida International University, USA
Shui Yu, Deakin University, Australia
Shuigeng Zhou, Fudan University, China
Shushuang Man, Southwest State University, USA
Shuxian Lun, Chinese Academy of Science, China
Simon Xu, Laurentian University, Canada
Song Guo, University of British Columbia, Canada
Stéphane S. Somspan, University of Ottawa, Canada
Sungwon Kang, Information and Communications University, Korea
Tai-Hoon Kim, Hannam University, Korea
Tansel Ozyer, TOBB Economics and Technology University, Turkey
Tianlong Gu, Guilin University Of Electronic Technology, China
Tong Li, Yunnan University, China
Tony Shan, IBM, USA
Wanggen Wan, Shanghai University, China
Wei-Ming Lin, University of Texas at San Antonio, USA
Wenhui Zhang, Institute of Software Chinese Academy of Sciences, China
Wenying Feng, Trent University, Canada
Wenyun Zhao, Fudan University, China
Wijesinha Alexander, Towson University, USA
Wu Zhang, Shanghai University, China
Wuwei Shen, Western Michigan University, USA
Xiangfeng Luo, Shanghai University, China
Xiaofeng Meng, Renmin University of China, China
Xiaojun Qi, Utah State University, USA

xxiv
Xuandong Li, Nanjing University, China
Yan Ha, Kyungin Women’s College, Korea
Yao Zhao, Beijing Jiaotong University, China
Yeong-Tae Song, Towson University, USA
Yingwei Luo, Peking University, China
Yimin Chen, Shanghai University, China
Yinsheng Li, Fudan University, China
Yixiang Chen, East China Normal University, China
Yixin Chen, University of Mississippi, USA
Yong Xiang, Deakin University, Australia
Yongbing Zhang, University of Tsukuba, Japan
Yongmei Lei, Shanghai University, China
Yoonsik Cheon, University of Texas at Dallas, USA
Yoshifumi Manabe, NTT Syber Space Laboratories, Japan
Youdong Ding, Shanghai University, China
Yuchun Fang, Shanghai University, China
Yue Chen, Zhejiang University, China
Zhenfu Cao, Shanghai Jiao Tong University, China
Zhenghua Duan, Xidian University, China
Zhiying Zhang, University of Tampere, Finland
Zhiyong Feng, Tianjin University, China
Zhongyu Chen, Zhejiang Normal University, China
Zongyan Qiu, Peking University, China
ICIS 2009 Keynotes and Invited Speakers

Keynote

Service Survivability Analysis

Prof. Jifeng He, Ph.D.
Professor of Shanghai Key Laboratory of Trustworthy Computing
East China Normal University

Keynote

The Programming Leap to Multithreading

Paul Tyma, Ph.D.
President/CTO
ManyBrain, Inc. USA

Invited Speaker

Let’s Talk about Time in Computer and Information Science

Prof. Jixin Ma, Ph.D.
Reader, School of Computing and Mathematical Sciences
University of Greenwich, UK
Service Survivability Analysis

Jifeng He
Professor of Shanghai Key Laboratory of Trustworthy Computing
East China Normal University
jifeng@sei.ecnu.edu.cn

Abstract
This talk presents a framework for service survivability analysis. We model the behaviour of individual service by a guarded design, which enables us to separate the responsibility of clients from the commitment made by the system, and identify a component by a set of failure and divergence. The notion of transition matrix is introduced to describe the impact caused by external attack. Consequently, the behaviour of a service component will be identified by a probabilistic process. We adopt the notion of process refinement to formalize the substitutability of service components, and specify the survivability of systems.

Bio
Ji-Feng He is a professor of computer science at East China Normal University (ECNU) and the Dean of Software Engineering Institute at ECNU. He graduated from the Department of Mathematics, Fudan University in 1965 and then worked in ECNU. In 1986, he was promoted to the rank of Professor. He joined in Stanford University and San Francisco University, USA during 1980 to 1981 as a Visiting Researcher. He joined Computing Lab of Oxford University, U.K. during 1983 to 1988 as a Senior Researcher. From 1998 to now, he was a senior research fellow of International Institute for Software Technology, United Nations University (UNU-IIST), Macau, China. In 2005, he was elected as CAS Academician. He has won the level-2 award of the 2002 State Natural Science Award, the 1st-Prize of the Electronics Industry Ministry Science & Technology Achievement Award, and the 1st-Prize of the Shanghai Science & Technology Achievement Award. Recently, he was appointed as the Chief Scientist for the “Trusted Software Fundamental Research” as a major research plan established by the National Natural Science Foundation of China (NSFC), and he was also appointed as the Chief Scientist for the “Theory and Practice on Coordination and Survivability for Massive Amount of Information” project as the
National Basic Research Program ("973" Program) established by the Ministry of Science and Technology (MOST).

Since 1980s, he began to engage in mathematical theory and applied research on programming. He and his collaborator presented a famous complete theory of data refinement in the papers Data Refinement Refined (1986), Prespecification in Data Refinement (1987) and Process Simulation and Refinement (1989). Based on the research on many programming languages semantics, he and C.A.R. Hoare proposed the unifying mathematical model about program and software criterion. In 1998, he and C.A.R. Hoare proposed Unifying Theories of Programming (UTP) and mathematical principle about Linking Theory (LT). He also used formal interface models to communicate with some programming languages and proposed a mathematical model and algebra law about non-deterministic dataflow. From 2006 to now, the international community has begun to organize a series of international conferences on UTP. In recent years, he has also been researching on the mathematical model about the co-design of software and hardware, which contributes to reducing the time and cost of system chip design.

He has published about 140 research papers in international journals and conferences. His research has significant impact on researchers and practitioners who are working in formal methods.
The Programming Leap to Multithreading

Paul Tyma
President/CTO
ManyBrain, Inc.
paul@manybrain.com

Abstract
The rise of multicore computing has taken the idea of concurrent programming from an interesting feature to a core competency of developing computer programs. As it turned out the tools, languages and programmers weren’t really ready. Concurrent program has the unique ability to appear obvious and simple while actually being extremely difficult and error-prone and in many languages remains the territory of experts. In this talk I survey computing old and new computer languages deciphering how and why they accommodate concurrent programming. This includes exposing the most common fallacies and pitfalls of concurrent program development into the evolution of new languages that embrace concurrent programs as first-class members.

Bio
Paul Tyma is President and CTO of ManyBrain, Inc., a company specializing in high-performance, highly-concurrent servers. He received his Ph.D. from Syracuse University with a dissertation focus of Java performance. He founded PreEmptive, a company specializing in software development and Java optimization, and served as the President of the company for over 10 years. He has consulted many businesses including leading hi-tech corporations and institutions. He spent 3 years at Google on several server teams including the extension of Google’s Java Servlet engine away from a traditional asynchronous I/O model to one that embraces synchronous I/O and thousands of threads.
Let’s Talk about Time in Computer and Information Science

Jixin Ma, Ph.D.
Reader, School of Computing and Mathematical Sciences
University of Greenwich, UK
J.Ma@gre.ac.uk

Abstract

We understand, when we speak of time; we understand also, when we hear it spoken of by another. However, what, then is time? If no one asks me, I know; but if I want to explain it to a questioner, I don’t know. Generally speaking, temporal representation and reasoning plays a fundamental and important role in Computer and Information Science. In particular, many knowledge-based systems need to deal with the temporal dimension of information, the change of information over time and the knowledge about how it changes. In fact, time seems to play the role of a common universal reference - everything appears to be related by its temporal reference, although temporal references may have different forms, such as: Absolute temporal entities (e.g., “10 am on the 1st of June 2009”) which refer to explicit time elements; Relative temporal entities (e.g., “during the time when the officer was in his office”) which refer to time elements that are known only by their relative temporal relations to other time elements, which again, may be absolute or relative; Absolute temporal durations (e.g., “45 minutes”) which refer to some certain amount of temporal granularity; and Relative temporal durations (e.g., “less than 3 hours”) which refer to some uncertain amount of temporal granularity. The problem of reasoning with temporal information in the mixture of these forms is two folds: (1) How to represent various kinds of temporal knowledge? (2) How to construct a reliable method of inference, based on the representation? The purpose of this talk is to motivate an important and interesting topic in Computer and Information Science. We shall present an overview on some fundamental issues with respects to temporal theories and models. Also, we shall introduce the three main approaches to the representation of temporal information. Some interesting examples in temporal representation and temporal reasoning will be illustrated as well.
Bio

Dr. Jixin Ma is a Reader at the School of Computing and Mathematical Sciences, at the University of Greenwich, UK. He is also a Guest/Visiting Professor of Beijing Normal University, Anhui University and Zhengzhou Light Industrial University, China.

Dr. Ma obtained his BSc and MSc of Mathematics in 1982 and 1988, respectively, and PhD of Computer Sciences in 1994. His main research areas include Artificial Intelligence, Software Engineering and Information Systems, with special interests in Temporal Logic, Temporal Databases, Reasoning about Action and Change, Case-Based Reasoning, Pattern Recognition and Graph Matching. He has published more than 70 research papers in international journals and conferences.

Dr. Ma has been the Deputy Editor of the Journal of Law, Computers, and Artificial Intelligence, Editor of the Journal of Polibits, International Journal of Mathematics and Engineering with Computers, the Asian Journal of Information Management, Journal of Applied Sciences, and Programme Committee Member of various international conferences. He has also served as reviewers of many international journals and conferences.
Sponsors

International Association for Computer & Information Science (ACIS)
www.acisinternational.org

In Cooperation with Shanghai University
www.shu.edu.cn

Supported by

The National Natural Science Foundation of China
www.nsfc.gov.cn