

SSIRI 2009: Keynote Speakers



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Probabilistic Programming With Coordination and Compensation

Abstract

Failure is the typical phenomena of the execution of long-running transactions. To accommodate the random features of internet-based computing we extend the Guarded Command Language by addition of probabilistic choice and coordination combinators. This paper deals with rollback and compensation mechanisms of the language by providing a probabilistic model. We also discuss algebraic properties of the new combinators, and show the completeness of the algebraic system by show how to convert programs to normal forms.

Biography

Ji-Feng He is an Academician of CAS (Chinese Academy of Sciences). In August 1943, He was born in Shanghai. And in Feb.1965, he graduated from Fudan University. At present, He works as Dean of Software Engineering Institute, East China Normal University (ECNU), Vice Dean of Academic Committee of ECNU, Dean of Shanghai Key Laboratory of Trustworthy Computing and Vice-Chairman of Science and Technology Commission of Shanghai Municipality. In the early 1980s, He was sent to foreign country for farther study. Once he was a visiting professor of Oxford University, and acted as a senior research fellow of International Institute for Software Technology, United Nations University (UNU-IIST), Macau, China. He has been engaged in computer software and theory over a long period of time. He has acquired plenty of achievements, and won the 2nd class award of the 2002 State Natural Science Award. He has published about 140 research papers in international journals and conferences, which have been cited more than 540 times by SCI publications. His research has significant impact on researchers and practitioners who are working in computer science from all over the world.

In recent years, he was honored of Shanghai excellent Chinese Communist, famous teacher, and model worker etc. 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).



Professor Bhavani
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Security Engineering: Developments and Directions

Abstract

Security Engineering is a critical component of Systems Engineering. When complex and large systems are put together, one needs to ensure that the systems are secure. Security engineering methodologies include gathering the security requirements, specifying the security policies, designing the security model, identifying the security critical components of the system design, security verification and validation and security testing. Before installation, one needs to develop a concept of operation (CONOPS) as well as carry out certification and accreditation. Much of the previous work in security engineering has focused on end to end security. That is, the organization needs to ensure that the applications, database systems, operating systems and networks have to be secure. In addition, one needs to ensure security when the subsystems are

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composed to form a larger system.

More recently with open systems and the web, secure system development is taking a whole new direction. The Office of the Deputy Assistant Secretary of Defense in the United States (Information and Identity Assurance) has stated that “the Department of Defense's (DoD) policy, planning, and war fighting capabilities are heavily dependent on the information technology foundation provided by the Global Information Grid (GIG). However, the GIG was built for business efficiency instead of mission assurance against sophisticated adversaries who have demonstrated intent and proven their ability to use cyberspace as a tool for espionage and criminal theft of data. GIG mission assurance works to ensure the DoD is able to accomplish its critical missions when networks, services, or information are unavailable, degraded, or distrusted.” To meet the needs of mission assurance challenges, President’s (George W. Bush) cyber plan (CNCI) has listed the area of developing multi-pronged approaches to supply chain risk management as one of the priorities. CNCI states that the reality of global supply chains presents significant challenges in thwarting counterfeit, or maliciously designed hardware and software products. To overcome such challenges and support successful mission assurance we need to design flexible and secure systems whose components may be untrusted or faulty. We need to achieve the secure operation of mission critical systems constructed from untrusted, semi-trusted and fully trusted components for successful mission assurance.

This keynote address will discuss the developments in security engineering from requirements, to policy to model to design to verification to testing as well as developing CONOPS and conducting certification and accreditation. System evaluation, usability and metrics related issues will also be discussed. Finally we will discuss the changes that have to be made to security engineering to support the next generation of secure systems for mission critical applications.

Biography

Dr. Bhavani Thuraisingham joined The University of Texas at Dallas (UTD) in 2004 as a Professor of Computer Science and Director of the Cyber Security Research Center in the Erik Jonsson School of Engineering and Computer Science. She is an elected Fellow of three professional organizations: the IEEE (Institute for Electrical and Electronics Engineers), the AAAS (American Association for the Advancement of Science) and the BCS (British Computer Society) for her work in data security. She received the IEEE Computer Society’s prestigious 1997 Technical Achievement Award for “outstanding and innovative contributions to secure data management.” Prior to joining UTD, Dr. Thuraisingham was an IPA (Intergovernmental Personnel Act) at the National Science Foundation (NSF) in Arlington VA, from the MITRE Corporation. At NSF she established the Data and Applications Security Program and co-founded the Cyber Trust theme. She worked at MITRE in Bedford, MA between January 1989 and September 2001 first in the Information Security Center and was later a department head in Data and Information Management. Dr. Thuraisingham’s work in information security and information management has resulted in over 80 journal articles, over 200 refereed conference papers and workshops, and three US patents. She is the author of eight books in data management, data mining and data security and has give over 60 keynote presentations. Dr. Thuraisingham was educated in the United Kingdom both at the University of Bristol and at the University of Wales

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 <p>Professor of Software Engineering School of Information and Technology George Mason University</p>	<p>Automatic Test Data Generation : Who, When and Where ?</p> <p><u>Abstract</u></p> <p>The past decade has seen exciting changes in how we develop and test software. Researchers have invented numerous techniques and criteria that are now mature enough to be ready for industrial use. During this time, the need for reliable software has grown enormously. The user base is expanding, technological advances put software into more mission-critical locations, software continues to grow in complexity, and secure software must be correct software. However, many of the strongest testing ideas invented by researchers have not yet been adopted by industry. In particular, one of the hardest problems in software testing is automatic generation of test inputs; a problem with many sophisticated solutions from the research community but for which industry tools only have primitive solutions.</p> <p>This talk will discuss automatic test data generation in the context of the model-driven test design process, then discuss mismatches between testing in industry and techniques from the research community. The talk will discuss why industry needs to improve testing, explore some of the difficulties in transitioning testing research results to industrial use, and close with a description of practical, usable engineering tools that can incorporate the best automatic test data generation ideas in pragmatic ways.</p> <p><u>Biography</u></p> <p>Dr. Jeff Offutt is Professor of Software Engineering at George Mason University. He has published over 110 refereed research papers and is co-author of Introduction to Software Testing. He is editor-in-chief of Wiley's journal of Software Testing, Verification and Reliability; steering committee chair for the IEEE International Conference on Software Testing, Verification, and Validation; program chair for ICST 2009; and on the technical board of advisers for Certess, Inc.</p>
 <p>Dr. Frances Paulisch Siemens AG Corporate Technology München, Germany</p>	<p>Reliability for Software-based Systems</p> <p><u>Abstract</u></p> <p>Reliability has long been a topic of importance, but as systems become increasingly complex, mission-critical, and pervasive, the importance grows even more. Many of today's systems are software-based and it is important that relevant techniques for reliability as well as other "-ilities" are also applied to such software-based systems. This presentation will present a selection of such techniques that can be applied at various stages in the development lifecycle to predict and increase the reliability of software-based systems.</p> <p><u>Biography</u></p> <p>Dr. Frances Paulisch is the leader of the "Software Initiative" of Siemens. She is based at the Corporate Technology division of Siemens AG in Munich, Germany. The Software Initiative coordinates all software research and development activities worldwide, both from a strategic view as well as for the sharing of best practices in the area of software engineering. Her areas of interest includes requirements engineering, especially the importance of non-functional requirements or "-ilities" for software-based systems. She received her doctorate in software engineering from the University of Karlsruhe. Frances is a member of the IEEE and the German Gesellschaft für Informatik.</p>

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Rudolf Siebenhofer
COO of Siemens IT
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“Complexity – Interoperability – Deployment of Software”: *Are we on the right way of progress in the Software Industry?*

Abstract

The testing of software is still not a favorite topic for graduates and engineers in the industry even some objective facts of effort, used time and relevance for product quality, shows that testing has a more than proportional relevance in the overall software development lifecycle.

The changes of the various paradigms in software development (evolution to new operating systems and programming languages) and the increasing complexity of functional and nonfunctional requirements as well as shortening the product development cycles have created another big problem: INTEROPERABILITY and testing of it.

The presentation will analyze some typical effects of this general problem in the software industry which is even more critical for areas where applications are mission critical for the users of this applications and it seems that the gap in (interoperability) testing is tried to be compensated by increasing the cycles of deployment of software with even worse results instead of reliable solutions.

Biography

Rudolf Siebenhofer has worked in the software industry for more than 35 years. He was the Work Package Leader for Information Society Community (IST) Projects in the 5th Framework Program of the EU and worked in close cooperation with other industrial partners and universities from eight European Countries. He taught as a lecturer for Effective Management and Team leading at the University of Klagenfurt with special focus on intercultural distributed teamwork management in software engineering. In 2004, he became the CEO of Siemens Program and System Engineering (Nanjing) Co., Ltd. He has also served as the Chief Operation Officer of Siemens IT Solutions & Services China since December 2007.