Keynote Speakers

Human Factors in Trustworthy Intelligent Service-Based Systems

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Abstract

Over the past decade, the rapid advances and growth in service-based systems in various applications, such as health care, banking, online retailing, aerospace, social networks and homeland security, have had major impacts on the economy, society, and our daily lives. Today, users are accustomed to accessing various online services from a wide range of intelligent devices, from smart phones, tablets, TVs and air-conditioners to desktop PCs, for both business and entertainments. Such a trend means that more users’ confidential information than ever is transmitted, processed and stored in intelligent service-based systems. This trend raises serious concerns on the trustworthiness of such systems. Substantial research has been devoted to developing security mechanisms, network protocols, and methods to improve the trustworthiness of intelligent systems. Human factors, however, have not been sufficiently addressed trustworthiness in intelligent service-based systems.

Human factors encompass many aspects of trustworthy intelligent service-based systems, from design of trust management for trustworthy intelligent service-based systems and analysis of tradeoff between system usability and security to evaluation of users’ confidence and the usability of the deployed smart systems. Human factors are more important in trustworthy intelligent service-based systems due to complicated interactions among infrastructure providers, service providers, application developers, and users.
In this keynote, the current state of the art of human factors considered in trustworthy intelligent service-based systems will be discussed, especially in how human factors are incorporated in improving system trustworthiness. Challenges and future research directions for human factors in the development of trustworthy service-based systems will be presented.

About the Keynote Speaker

Stephen S. Yau is the director of Information Assurance Center and a professor of computer science and engineering at Arizona State University (ASU), Tempe, Arizona, USA. He served as the chair of the Department of Computer Science and Engineering at ASU in 1994-2001. Previously, he was on the faculties of Northwestern University, Evanston, Illinois, and University of Florida, Gainesville.

He served as the president of the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE) and was on the IEEE Board of Directors, and the Board of Directors of Computing Research Association. He served as the editor-in-chief of Computer. He organized many national and international major conferences, including the 1989 World Computer Congress sponsored by International Federation for Information Processing (IFIP), and the Annual International Computer Software and Applications Conference (COMPSAC) sponsored by the IEEE Computer Society. He is currently serving as a general co-chair of the IEEE 10th World Congress on Services and its five co-located conferences in Anchorage, Alaska in 2014.

His current research includes intelligent service-based systems, cloud computing, autonomic and ubiquitous computing, trustworthy computing, cyber security and software engineering. He has received many awards and recognitions for his accomplishments, including the Tsutomu Kanai Award and Richard E. Merwin Award of the IEEE Computer Society, the IEEE Centennial Award and Third Millennium Medal, the Outstanding Contributions Award of the Chinese Computer Federation, and the Louis E. Levy Medal of the Franklin Institute. He is a Life Fellow of the IEEE and a Fellow of the American Association for the Advancement of Science.

He received the M.S. and Ph.D. degrees from the University of Illinois, Urbana, and the B.S. degree from National Taiwan University, Taipei, all in electrical engineering.
Dependable Cloud Computing

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Abstract

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Recent years have seen a growing interest among users in the migration of their applications to the Cloud computing environments. However, due to high complexity, Cloud-based services often experience a large number of failures and security breaches, and, consequently, impose numerous challenges on the dependability of users’ applications.

Unfortunately, current dependability solutions focus either on the infrastructure itself or on application analysis, but fail to consider the complex inter-dependencies between system components and application tasks. This aspect is highly crucial especially when Cloud environments are used, as it is increasingly considered nowadays, in mission-critical applications.

This talk will discuss a user-centric, dependability-driven framework that considers the following aspects:

- Deploying and protecting users’ applications in the Cloud infrastructure so as to minimize their exposure to the vulnerabilities in the network. This allows users to run their applications in the Cloud in the most secure manner as possible.
- Offering fault tolerance as a service to the users who need to deploy their applications in the Cloud. This approach allows an application to obtain the required fault tolerance properties from a third party in a transparent manner, and increase its reliability and availability.
About the Keynote Speaker

Vincenzo PIURI has received his Ph.D. in computer engineering at Politecnico di Milano, Italy (1989). He has been Associate Professor at Politecnico di Milano, Italy and Visiting Professor at the University of Texas at Austin and at George Mason University, USA. He is Full Professor in computer engineering (since 2000) and has been Director of the Department of Information Technology at the Università degli Studi di Milano, Italy.

His main research interests are: fault tolerance, digital processing architectures, cloud computing, embedded systems, arithmetic architectures, biometrics, pattern analysis and recognition, signal and image processing, machine learning, theory and industrial applications of neural networks, intelligent measurement systems, and industrial applications. Original results have been published in more than 350 papers in international journals, proceedings of international conferences, books, and book chapters.

He is Fellow of the IEEE, Distinguished Scientist of ACM, and Senior Member of INNS. He is Editor-in-Chief of the IEEE Systems Journal (2013-15), and has been Associate Editor of the IEEE Transactions on Neural Networks and the IEEE Transactions on Instrumentation and Measurement. He has been IEEE Director and IEEE Delegate for Division X, President of the IEEE Computational Intelligence Society, Vice President for Publications of the IEEE Instrumentation and Measurement Society and the IEEE Systems Council, Vice President for Membership of the IEEE Computational Intelligence Society, and Vice President for Education of the IEEE Biometrics Council. He has been elected 2014 IEEE Vice President-elect for Technical Activities.

He received the IEEE Instrumentation and Measurement Society Technical Award (2002) for the contributions to the advancement of theory and practice of computational intelligence in measurement systems and industrial applications, the IEEE Instrumentation and Measurement Society Distinguished Service Award (2008), and the IEEE Computational Intelligence Society Meritorious Service Award (2009).
Programming Support for Heterogeneous Many-core Architectures

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Abstract

With the shift towards heterogeneous many-core architectures comprised of conventional multi-core CPUs, GPUs, and other types of accelerators, the challenges of parallel programming will sharply rise. Research in high-level programming methodologies, compilation and runtime technologies, as well as in automatic performance tuning will be crucial in order to cope with the ever-increasing complexity of programming such architectures.

In this talk, we argue that a high-level compositional approach to parallel software development in concert with an intelligent runtime system and autotuning techniques can significantly enhance programmability of future parallel systems, while ensuring efficiency and performance portability across a range of different architectures. We report on recent research results of two European projects, PEPPHER and AUTOTUNE, which are addressing the challenges of software development for current and emerging parallel systems, and discuss related research efforts and potential future directions.

About the Keynote Speaker

Siegfried Benkner is professor of Computer Science at the University of Vienna, Austria, where he heads the Scientific Computing Research Group. He received MSc and PhD degrees in Computer Science from the Vienna University of Technology. His research interests include languages, compilers and runtime systems for parallel and distributed computing, service-oriented software architectures, and Grid and Cloud computing.

Siegfried Benkner contributed to several European research projects in the area of parallel and distributed computing, including PPPE, PREPARE, HPF+, GEMSS, @neurIST, VPH-SHARE, and AUTOTUNE, and was coordinator of the PEPPHER project. Siegfried Benkner has published more than 100 peer-reviewed publications and is a member of the ACM and the IEEE.