Welcome to Orlando for the 2016 IEEE International Systems Conference

I would like to extend a warm and cordial welcome to our attendees at the 10th Annual IEEE International Systems Conference here in the beautiful, sunny Florida city of Orlando. Among our attendee ranks are engineers and practitioners, academics and researchers, government folks and students from multiple countries around the globe, all with the common interest of systems engineering for complex systems.

We have a very full and varied program on tap for you, covering all aspects of complex systems and systems of systems and the highly specialized systems engineering skills that accompany such systems, and I must give special thanks to our Technical Program Chair, Dr. Sidney Givigi, of the Royal Military College of Canada, who has put in countless hours of his valuable time to select the most appropriate content from the truly outstanding candidate material submitted for presentation this week.

Our world is growing more complex by the day, and the systems we must design, build, put in service and maintain are ever increasing in complexity, not only because of the huge scope of our complex systems but also the ever-advancing technology that beckons to us with its promise of increased functionality and cleverness. From our communication systems to our entertainment systems, from energy generation and delivery systems to transportation systems, from exploration systems to manufacturing and production systems, from health care systems to safety and security systems, and from weapon systems to defense systems, all of these demand competent and effective engineering solutions, using the best minds in systems engineering that the world can produce.

And this is what this conference is all about, the exploration and exchange of information relative to such complex and all-encompassing systems and the transfer of knowledge that we hope will enhance your job, your function, your contributions to these complex systems that are for the general benefit of humanity, which a key focus of the Institute of Electrical Engineers or IEEE today. And speaking of IEEE, we are pleased to have in attendance this week the immediate past Vice President of IEEE Technical Activities, Dr. Vincenzo Piuri, who is also the Editor-in-Chief of the Systems Journal, and I am sure he would enjoy engaging in conversation with attendees.

So please enjoy your visit and partake of the technical content that we offer you. We hope you enjoy not only this conference but your stay in Florida, and if there is anything we can do to make your visit more comfortable, please do not hesitate to contact one of our helpful staff.

Bob Rassa
Conference Chair
Past President, IEEE Systems Council

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Keynote Speaker

Model- and Component-Based Design of Cyber-Physical Systems

Janos Sztipanovits
Institute for Software Integrated Systems,
Vanderbilt University

Abstract:
Model- and component-based design have yielded dramatic increase in design productivity in several narrowly focused homogeneous domains, such as signal processing, control and aspects of electronic design. However, significant impact on the design and manufacturing of complex cyber-physical systems (CPS) such as vehicles has not yet been achieved. This talk describes challenges of and solution approaches to building a comprehensive design automation tool suite for complex CPS. The primary driver for the OpenMETA tool suite was to push the boundaries of "correct-by-construction" methods to decrease significantly the costly design-build-test-redesign cycles in design flows. The discussion will focus on the impact of heterogeneity in modeling, analyzing and optimizing CPS designs. This challenge is compounded by the need for rapidly evolving design flows by changing/updating the selection of modeling languages, analysis and verification tools and synthesis methods. Based on experience with the development of OpenMETA and with the evaluation of its performance in a complex CPS design challenge, the talk will argue that the current vertically integrated, discipline-specific tool chains for CPS design need to be complemented with horizontal integration layers that support model integration, tool integration and design process integration. The presented arguments will be based on the OpenMETA technical approach including the new integration layers, an overview of the technical framework used for their implementation and on practical experience with their application.

Bio:
Dr. Janos Sztipanovits is currently the E. Bronson Ingram Distinguished Professor of Engineering at Vanderbilt University and founding director of the Institute for Software Integrated Systems. Between 1999 and 2002, he worked as program manager and deputy director of DARPA Information Technology Office. He was member of the US Air Force Science Advisory Board between 2006 and 2010. His current research interest includes the foundation and applications of model and component-based design of Cyber Physical Systems, design space exploration and systems-security co-design technology. He leads the CPS Virtual Organization and he is co-chair the CPS Reference Architecture and Definition public working group established by NIST in 2014. In 2014/2015 he was elected to be member of the Steering Committee of the Industrial Internet Consortium. He was founding chair of the ACM Special Interest Group on Embedded Software (SIGBED). Dr. Sztipanovits was elected Fellow of the IEEE in 2000 and external member of the Hungarian Academy of Sciences in 2010.