

Service-Oriented Things: A Service-Oriented Paradigm for Internet of Things

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Abstract: In the past decade, many Internet based applications have adopted the service-oriented architecture (SOA) to facilitate easy discovery, composition and adoption of services from service providers on Internet. In the mean time, as the wave of Internet of Things (IoT) becomes more widespread and promising, many IoT projects have been conceptualized, designed and tested. Given the vision of IoT is to deploy and connect smart things on Internet, it is natural for us to build smart things as service components and apply the SOA paradigm on these physical devices in our environment to compose cyber-physical services. In this talk, we propose the vision of “Service-Oriented Things” (SOT) which is used to discover, compose and deploy mixed cyber and physical services so that developers can easily integrate Internet of Things with traditional IT. We then present the WuKong project which is implementing the SoT programming support for future IoT enablement. WuKong has three features that make it attractive for IoT programming: sensor virtualization, service orientation, and user personalization. The WuKong middleware is designed to perform automatic sensor identification, device configuration, service composition, and system re-configuration. It allows the developer to design the application behavior at a higher level. An innovative sensor-based system management paradigm is also presented. The WuKong middleware and programming tool make it much easier to build smart services that are aware of and responsive to physical environment.

Speaker: Since 1997, Kwei-Jay Lin has been a Full Professor in the EECS Department at the University of California, Irvine. He was an Associate Professor at the University of Illinois at Urbana-Champaign before that. He is an Adjunct Professor at many universities and research institutes, including the National Taiwan University and National Tsinghua University, Taiwan; Zhejiang University and Tongji University, China, and Freiburg University, Germany. He is Chief Scientist at the Intel-NTU Connected Context Computing Center at the National Taiwan University, Taipei, Taiwan, and a Visiting Research Fellow at the Institute of Information Science, Academia Sinica, Taiwan. The Intel-NTU Connected Context Computing (CCC) Center which is jointly funded by Intel and National Science Council for developing scalable machine-to-machine (M2M) technologies. More than 20 projects are being conducted in the CCC Center.



He is an IEEE Fellow and Editor-In-Chief of the Springer Journal on Service-Oriented Computing and Applications (SOCA), Editor-In-Chief of the Software Track of the Journal of Information Science and Engineering. He was the Co-Chair of the IEEE Technical Committee on Business Informatics and Systems (TCBIS) until 2012. He was an Associate Editor of IEEE Transactions on Parallel and Distributed Systems, 2002-2006, and an Associate Editor of IEEE Transactions on Computers, 1996-2000. He served as the External Examiner for the University of Hong Kong Master Program on E-Commerce and Internet Computing during 2006-2009. In 2007-2008, he was a Visiting Chair Research Fellow at the Academia Sinica, Taiwan. In the summer of 2009, he was a Visiting Distinguished Professor at the Tsinghua University in China. He was the Steering Committee Chair of the Computer Science Engineering Program at UC Irvine in 2007-2008.

He has served on many international conferences, recently as conference chairs of SOCA 2013, CBI 2013, CEC 2012, SOCA 2011 and 2012, program vice-chair of ICPP 2010 and ICPADS 2011. His research interest includes service-oriented systems, IoT systems, middleware, real-time computing, and distributed computing.