The School of Informatics, Computing, and Engineering (SICE)

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When Real-Time Scheduling Theory Meets Cyber-Physical Systems

Zhishan Guo

Zhishan Guo is a tenure-track assistant professor in Department of Computer Science at Missouri University of Science and Technology (formerly University of Missouri at Rolla). He received the Bachelors degree (with honor) in Computer Science and Technology from Tsinghua University, China, in 2009, the M. Phil. degree in Mechanical Automation and Engineering from the Chinese University of Hong Kong, Hong Kong, in 2011 (advisor Prof. Jun Wang), and the Ph.D. degree in Computer Science from the University of North Carolina at Chapel Hill (advisor Prof. Sanjoy K. Baruah). His current research interests include real-time scheduling, neural networks, and their applications in cyber-physical systems.

Abstract

Many Cyber-Physical Systems (CPS) are required to be of high confidence, sometimes with provable correctness. However, models and analytical results in traditional real-time scheduling theory are unable to cope with the full complexity of today's CPS. As embedded systems become more and more advanced and rich in functionalities, uncertainties in their run-time behavior, e.g., the gaps between average-case and worst-case execution times of pieces of code are becoming more significant, leading to intolerable waste of computing capacity. In this talk, I will examine the relationship between real-time scheduling theory and the discipline of Cyber-Physical Systems, and briefly report some of our recent progress in better modeling such uncertainties and analyzing schedulability in real-time CPS.

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