Software Abstractions and Architectures for Smart Cyber-Physical Systems

Keynote Address

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Abstract

The significant increase in the ubiquity and connectivity of computing devices has opened new possibilities for addressing social and environmental challenges, e.g., ambient assisted living, smart city infrastructures, emergency coordination, environmental monitoring. Engineering such systems commonly called smart Cyber-Physical Systems (sCPS) is typically very challenging because of their inherent dynamicity, open-endedness, autonomicity, and close relation to the real world. The trend observed in modern sCPS is that they are becoming increasingly complex and heavily rely on software to increase their efficiency and resilience. It is natural to expect that in the future of sCPS, the software will be by far the most complex constituent of such systems. This talk aims to present the challenges of engineering software for sCPS and to explain and demonstrate a novel approach based on autonomic component ensembles that provides means (methods and tools) for seamless design and development of sCPS.

Bibliography

Petr Hnetynka is an associate professor at the Department of Distributed and Dependable Systems, Faculty of Mathematics and Physics, Charles University, Czech Republic. He received his Ph.D. degree in 2005 also from Charles University. In the meantime, he held a postdoctoral researcher position at University College Dublin, Ireland. He specializes in component-based development, model-driven development and smart cyber-physical systems. He co-authored over 50 referred articles and served as program committee chair and/or member of numerous international conferences.

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