You are invited to the 45th edition of the PRAGUE COMPUTER SCIENCE SEMINAR

TOMÁŠ BUREŠ

Smart Cyber-Physical Systems

The lecture will be followed by a discussion

ABSTRACT

Smart Cyber-Physical Systems and Internet of Things are some of the names attributed to the next generation of systems consisting of a large number of distributed and potentially mobile components that interact with their environment and with other components of the system. Thanks to this extensive collaboration and data sharing, the whole system becomes "smart" in its decisions. This means that the system can adapt to various situations and derive the best out of them. An important feature of these systems is that their "smartness" increasingly relies on software, up to the point when the software becomes by far their most complex and most critical part. Another important feature of these systems is that they are highly dynamic – as components of the system move and adapt to new situations in their environment, the whole system has to continuously reconfigure itself. The resulting software complexity is typically tackled by building hierarchical software architecture abstractions. However, traditional methods of modeling software architectures cannot easily cope with the level of dynamicity present in these systems.

In this lecture, we will look into novel software architecture concepts that specifically target the dynamicity and allow tackling the software complexity of the systems. In particular, we will introduce a concept of autonomous component ensembles, which provide a hierarchical abstraction for modeling dynamic coalitions of components.

ABOUT THE PRAGUE COMPUTER SCIENCE SEMINAR

The seminar takes place once a month on Thursdays at 4:15pm (except June to September, and December) alternately in the buildings of Faculty of Electrical Engineering, Czech Technical University in Prague, Karlovo nám. 13, Praha 2 and Faculty of Mathematics and Physics, Charles University, Malostranské nám. 25, Praha 1. Its program typically consists of a one-hour lecture followed by a discussion. The lecture is based on an (internationally) exceptional or remarkable achievement of the lecturer, presented in a way which is comprehensible and interesting to a broad computer science community. The lectures are in English.

Tomáš Bureš is an Associate Professor and former Chair of the Department of Distributed and Dependable Systems, Faculty of Mathematics and Physics, Charles University. He had a doctoral internship at NASA AMES, then, after his PhD, a one-year post-doc position at Mälardalen University, Sweden, and he also held a 3-semester-long visiting professor position at LMU Munich. His research focus is on dynamic software architectures and self-adaptive systems, for which he received several best-paper awards. He was involved (as Participant Coordinator) in a number of international research projects (ECSEL, ITEA3/EUREKA, FP7, ESA, and COST) and bilateral university-industry projects. He served as a Program Committee Chair and a PC member of numerous international conferences.

Contact: info@praguecomputerscience.cz
Information: www.praguecomputerscience.cz