Tools and Concepts for Communication and Networked Systems – Or: How to build resilient IoT Systems?

Mesut Güneş[1], Sebastian Zug[2], Matthias König[3]

The first workshop on Tools and Concepts for Communication and Networked Systems (TCoNS) will be on Friday 2. October 2020 at Kongresszentrum Karlsruhe, co-located with the 50. GI-Jahrestagung INFORMATIK2020.

The goal of the workshop is to provide a platform for discussions about the evolution of the Internet of Things (IoT) from a practical point of view that is best described in the subtitle of the workshop, namely "How to build resilient IoT Systems?"

The Internet of Things (IoT) and related future networking concepts promise the ubiquitous availability of data. Applications can aggregate and evaluate relevant sets of data, and they can provide highly flexible, context-aware services, which can interact with each other and form a new type of emergent behavior.

The first part of the story has already become reality. Sensors aggregating current values as well as data storages providing historical information emerge wildly around us in terms of computational capacity and data quantity. But did we already achieve the goals from an application and coordination point of view? Embedded, low performance IoT devices transmit their data periodically or event-driven to a database that serves the applications' requests. By separating data producers from recipients, the traditional approach limits the flexibility and efficiency of the system. In contrast, accessibility and controllability of the IoT nodes immediately by (multiple) applications ensure a finely tuned configuration of individual embedded systems as well as the whole network. It will no longer be valuable to restrict IoT systems to static behavior, thus new methods, models, and algorithms are required to ensure functionality, resiliency, and security.

This workshop addresses current research related to the implementation and realization of future IoT applications and systems. One focus is put on the practical side of challenges, i.e., how to build an IoT system at least in a prototypical way. The focus is mainly on concepts, tools, and the toolchain, required for this endeavor. Furthermore, flexible right management, capability and performance profiles, and request evaluation for dynamically composed IoT

[1] Otto-von-Guericke Universität Magdeburg, Fakultät für Informatik, Universitätsplatz 2, 39106 Magdeburg, Germany, mesut.guenes@ovgu.de
[2] Technische Universität Bergakademie Freiberg, Informatik, Germany, sebastian.zug@informatik.tu-freiberg.de
[3] Bielefeld University of Applied Sciences, Campus Minden, Artilleriestraße 9, 32427 Minden, Germany, matthias.koenig@fh-bielefeld.de

doi:10.18420/inf2020_109

settings will be targeted. We want to discuss how to realize abstract representations of these aspects in order to automatically react to adapted requests, changed network configurations, or system states.

All submissions to the workshop have gone a rigid review by at least three reviewers, who pointed out ways to improve the papers. We thank all anonymous reviewers for their contribution to the workshop. Luckily enough, we could accept all submitted eight papers to the workshop, which represent diverse perspectives of the ongoing endeavor of how to build resilient IoT systems.

Organizers:

- Mesut Güneş, Otto-von-Guericke Universität Magdeburg
- Sebastian Zug, Technische Universität Bergakademie Freiberg
- Matthias König, Fachhochschule Bielefeld

Workshop TPC Chairs: Frank Engelhardt, Marian Buschsieweke, Ali Nikoukar

Publicity Chair: Katja Nothnagel

Technical Program Committee:

- Andreas Reinhardt, Technische Universität Clausthal
- Anna Förster, Universität Bremen
- Bettina Schnor, Universität Potsdam
- Björn Scheuermann, Humboldt Universität zu Berlin
- Christian Bettstetter, Universität Klagenfurt
- Christian Renner, Universität zu Lübeck
- Claudia Linnhoff-Popien, Ludwig-Maximilians-Universität München
- Jochen Schiller, Freie Universität Berlin
- Joerg Nolte, Brandenburgische Technische Universität Cottbus-Senftenberg
- Karin Anna Hummel, Johannes Kepler Universität Linz
- Kay Roemer, Technische Universität Graz
- Kurt Tutschku, Blekinge Institute of Technology
- Lars Wolf, Technische Universität Braunschweig
- Oliver Hahm, RIOT OS / Zühlke
- Reinhard German, Freie Universität Berlin
- Stefan Fischer, Universität zu Lübeck
- Thomas Schmidt, HAW Hamburg