3rd International Workshop on Requirements Engineering for Self-Adaptive & Cyber Physical Systems

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1 Introduction

With increasing connectivity and communication between highly-automated systems, systems become more context-dependent and allow for online adaptation at runtime. There are two classes of such systems: Self-Adaptive Systems (SAS) and Cyber Physical Systems (CPS). While the term "self-adaptive" typically refers to any kind of system which alters its behavior (e.g., service-based systems or information systems), the term "cyber physical" is often used to describe special properties of embedded systems which communicate and dynamically interconnect with one another. Behavioral adaptation and runtime interconnection pose new challenges for the development process, and ad-hoc physical networking and emergent functionality must be systematically engineered and validated in early phases of development, i.e. during requirements engineering. The International Workshop on Requirements Engineering for Self-Adaptive and Cyber Physical Systems is a platform to investigate this impact.

2 A Look Back: RE for SAS and CPS through the Years

In the 2015 edition of RESACS, context-awareness, context engineering, and trustworthiness were recognized as the key challenges of adaptive systems. According to the lively discussion, humans must be able to rely on adaptation to occur when expected, but not to occur when unnecessary. This must be facilitated by eliciting, documenting, and reasoning about assumptions pertaining to the context in which adaptation occurs. In the opinion of the workshop participants, this would introduce a certain degree of predictability into adaptation. While in 2015 workshop topics were centered around challenges in SAS and CPS, the 2016 edition of RESACS was concerned with solution approaches. For example, the applicability of the MAPE loop was discussed. It was proposed to monitor not only the system's execution, but also the factors influencing the system in order to decide for adaptation. On the one hand, this further aids in introducing adaptation predictability. On the other hand, this allows systems to

identify threats to privacy. According to some discussants, systems may strategically ask for user involvement, e.g., when privacy settings etc. are violated.

3 Summary of RESACS 2017

In this year's workshop program, papers place focus on the model-based engineering of SAS and CPS. In the research paper by J. Muñoz-Fernández, A. Knauss, L. Castaneda, M. Derakhshanmanesh, and R. Heinrich [1], it is proposed to capture ambiguity within engineering artifacts to foster requirements engineering. In [2], A. Vasenev, D. Ionita, T. Zoppi, A. Ceccarelli, and R. Wieringa elaborate on the defining security requirements by taking iconicity of informal modeling languages in account. W. Shanaa, S. Spier, and B. Tenbergen present in [3] a case study on model-based requirements engineering of an avionics CPS and investigate the impact of challenges prescribed by literature. In addition to the peer-reviewed papers, F. Houdek and S. Schmerler, from Daimler AG, gave an interesting and enjoyable talk on autonomous driving, its implications and future challenges on requirements engineering [4].

4 Workshop Technicalities

Once again, each paper was reviewed by at least three members of the program committee. The reviews focused on the soundness of the presented ideas, the technical quality of the manuscripts, and their suitability with regard to the scope of the workshop. We, the organizers, would like to place particular emphasis on the extraordinarily high quality of the reviews, which were critical, yet constructive, and lead to accepting a total of three full papers. We are indebted to the program committee members:

- Raian Ali – *Bournemouth University, UK*
- Ottmar Bender – *Airbus Defence and Space, Germany*
- Jennifer Brings – *University of Duisburg-Essen, Germany*
- Maya Daneva – *University of Twente, Netherlands*
- Peter Heidl – *Robert Bosch GmbH, Germany*
- Kai Petersen – *Blekinge University, Sweden*
- Carme Quer – *Universitat Politècnica de Catalunya, Spain*
- Rick Rabiser – *Johannes Keppler University, Austira*
- Vítor E. Silva Souza – *Federal University of Espírito Santo, Brazil*

References

1. Muñoz-Fernández, J.; Knauss, Castaneda, L.; Derakhshanmanesh, M.; Heinrich, R.: Capturing Ambiguity in Artifacts to Support RE for SAS.
2. Vasenev, A.; Ionita, D; Zoppi, T.; Ceccarelli, A.; Wieringa, R.: Towards Security Requirements: Iconicity as a Feature of an Informal Modeling Language.
3. Shanaa, W.; Spier, S.; Tenbergen, B: A Case Study into the Development Process of CPS.
4. Houdek, F.; Schmerler, S.: Automotive Future and its Impact on RE.