From Design-Time to Runtime and Back Again with Liquid Models

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Keynote Abstract

Today, we recognize a discrepancy between design models concentrating on the desired behaviour of a system and its real world correspondents reflecting deviations taking place at runtime. In order to close this gap, design models must not be static, but evolutionary artefacts so to speak liquid models. Such liquid models are the cornerstone of our research project CDL-MINT (https://cdl-mint.se.jku.at/) which is about the model-based continuous evolution of cyber-physical systems based on operational data gathered and analysed at runtime. In my talk, I will present some initial results of this project, in particular the liquid models architecture for linking design models with runtime concerns. I will also elaborate on the proposed technologies for the respective architectural layers and identify the research challenges ahead.

Keywords liquid models, cyber-physical systems, desing time, runtime

Short Biography

Manuel Wimmer is Full Professor and Head of the Department of Business Informatics Software Engineering at the Johannes Kepler University Linz, Austria. He received his Ph.D. and his Habilitation from TU Wien, Austria. He has been a research associate at the University of Malaga, Spain, a visiting professor at the University of Marburg, Germany as well as at TU Munich, Germany, and an assistant professor at the Business Informatics Group (BIG), TU Wien, Austria. Currently, he is also leading the Christian Doppler Laboratoy on Model-Integrated Smart Production (CDL-MINT) which is running from 2017 to 2023. In this context, he is developing modeling approaches for smart production facilities, as well as techniques for the continuous evolution of such systems based on production information gathered and analyzed at runtime.

Moreover, he is/was involved in several national and international projects dealing with the foundations and application of model engineering techniques, especially metamodeling and model transformations, for domains such as tool interoperability, legacy tool modernization, model versioning and evolution, software reverse engineering and migration, Web engineering including social Web and semantic Web, Cloud computing, and flexible production systems. He is co-author of the book Model-driven Software Engineering in Practice (Morgan & Claypool, second edition, 2017).