HPI Kolloquium
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Hasso-Plattner-Institut, Vorlesungsgebäude, Auditorium 1
Campus Griebnitzsee, 14482 Potsdam

"Flexible, Adaptable & Compliant Process-Aware Information Systems with DCR Graphs"

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Abstract
Software systems today support complex processes and interactions between humans and machines in many different variants, from the embedded controller in a pace maker to the hospital workflow system. On the one hand, these process-aware information systems often operate in unpredictable and changing contexts which calls for both flexibility and adaptability. On the other hand, it is getting more and more critical that the software system behaves correctly and is compliant with safety, security and legal regulations. In this talk we will present theory and applications of Dynamic Condition Response (DCR) graphs, a declarative event-based process language and the commercial DCRGraphs.net tool supporting collaborative process design and simulation. The language and tool is the result of the TrustCare.eu research project and a subsequent industrial PhD project supported by the Danish national research foundations, ITU and Exformatics A/S and the ongoing Computational Artefacts (CompArt) project supported by the Velux foundation. From a theoretical point of view, the DCR process language generalizes the seminal model of event-structures to allow for finite representations of infinite behavior and a distinction between events that may and must occur. This makes the model able to characterize with finite state models the union of regular and omega-regular properties and thus the specification and verification of both safety and liveness properties. The extension to timed DCR graphs maintains the finite state, regular behavior, while extensions with dynamic generation of sub processes makes the language Turing complete. From a practical point of view, DCR graphs have been applied by Exformatics as the foundation for their general adaptive case management solution and has been applied on real cases in different domains, spanning from healthcare to financial processes and emergency management

Short CV
Thomas Hildebrandt is associate professor at IT University of Copenhagen and head of the Process and System Models research group (www.itu.dk/research/models). Hildebrandt obtained his PhD in 1999 from Aarhus University and has published more than 50 peer-reviewed papers in the areas of formal models for concurrency, distributed and mobile systems and applications to the implementation of process-aware information systems. He has been the principal investigator of several nationally funded interdisciplinary research projects with industry partners. Currently he is member of the management committee for an EU COST action on behavioral types for complex distributed systems and co-investigator on the Computational Artefacts (www.compart.ku.dk) project supported by the Velux foundation. He is facilitator for interest groups in the area of processes and IT in two innovation networks (Infinit.dk and the new innovation network for finance and IT, www.cfir.dk) and employed as expert in the private knowledge network VidenDanmark.dk facilitating a knowledge group on digitalization and process-orientation.

Host
Prof. Dr. Mathias Weske