2012 ICSE Workshop on Software Engineering for Adaptive and Self-Managing Systems

(SEAMS 2012)

Zurich, Switzerland
4 – 5 June 2012
Contents

Preface
Foreword
Committees

Service-Based Systems
Proactive Adaptation of Service Composition
Rafael R. Aschoff and Andrea Zisman — City University London, UK ........................................ 1
Dynamic Self-Adaptation for Distributed Service-Oriented Transactions
Hassan Gomaa and Koji Hashimoto — George Mason University, USA ........................................ 11
OSIRIS-SR: A Safety Ring for Self-Healing Distributed Composite Service Execution
Nenad Stojnic and Heiko Schuldt — University of Basel, Switzerland ........................................... 21

Exemplars
Traffic Routing for Evaluating Self-Adaptation
Jochen Wuttke, Yuriy Brun, Alessandra Gorla, and Jonathan Ramaswamy — University of Washington, USA; University of Lugano, Switzerland ........................................... 27

Control Theory and Resilience
A Systematic Survey on the Design of Self-Adaptive Software Systems Using Control Engineering Approaches
Tharindu Patikirikorala, Alan Colman, Jun Han, and Liuping Wang — Swinburne University of Technology, Australia; Royal Melbourne Institute of Technology, Australia ........................................... 33
Reliability-Driven Dynamic Binding via Feedback Control
Antonio Filieri, Carlo Ghezzi, Alberto Leva, and Martina Maggio — Politecnico di Milano, Italy; Lund University, Sweden ........................................... 43
Javier Cámara and Rogério de Lemos — University of Coimbra, Portugal; University of Kent, UK ........................................... 53

Distributed Systems
Coordination of Distributed Systems through Self-Organizing Group Topologies
Sam Guinea and Panteha Saeedi — Politecnico di Milano, Italy ........................................... 63
Timing Constraints for Runtime Adaptation in Real-Time, Networked Embedded Systems
Marc Zeller and Christian Prehofer — Fraunhofer ESK, Germany ........................................... 73
A Middleware and Algorithms for Trust Calculation from Multiple Evidence Sources
Chern Har Yew and Hanan Lutfiyya — University of Western Ontario, Canada ........................................... 83

Surveys and Taxonomies
Claims and Supporting Evidence for Self-Adaptive Systems: A Literature Study
Danny Weyns, M. Usman Iftikhar, Sam Malek, and Jesper Andersson — Linnaeus University, Sweden; George Mason University, USA ........................................... 89
A Taxonomy of Uncertainty for Dynamically Adaptive Systems
Andres J. Ramirez, Adam C. Jensen, and Betty H. C. Cheng — Michigan State University, USA ........................................... 99
A Taxonomy and Survey of Self-Protecting Software Systems
Eric Yuan and Sam Malek — George Mason University, USA ........................................... 109
Models and Mediators
Model-Based Adaptive DoS Attack Mitigation
   Cornel Barna, Mark Shtern, Michael Smit, Vassilios Tzerpos, and Marin Litoiu — York University, Canada 119

A Language for Feedback Loops in Self-Adaptive Systems: Executable Runtime Megamodes
   Thomas Vogel and Holger Giese — HPI, Germany 129

Towards Mediation-Based Self-Healing of Data-Driven Business Processes
   Tomasz Haupt — Mississippi State University, USA 139

Requirements and Specifications
Synthesizing Dynamically Updating Controllers from Changes in Scenario-Based Specifications
   Carlo Ghezzi, Joel Greenyer, and Valerio Panzica La Manna — Politecnico di Milano, Italy 145

(Requirement) Evolution Requirements for Adaptive Systems
   Vitor E. Silva Souza, Alexei Lapouchian, and John Mylopoulos — University of Trento, Italy 155

On the Role of Primary and Secondary Assets in Adaptive Security: An Application in Smart Grids
   Liliana Pasquale, Mazeiar Salehie, Raian Ali, Inah Omoronyia, and Bashar Nuseibeh — Lero, Ireland; Bournemouth University, UK; Open University, UK 165