Table of Contents

Message from General Chair ..................................................................................................................... ix
Message from Program Chairs ................................................................................................................ x
Message from Industry Chair ................................................................................................................... xii
Organizing Committee ............................................................................................................................. xiii
Program Committee ................................................................................................................................ xiv
Additional Reviewers ............................................................................................................................... xvi
Keynotes ................................................................................................................................................... xvii

Software Architecture Design
The Stream Software Connector Design Space: Frameworks and Languages for Distributed Stream Processing ......................................................................................................................... 1
  Masiar Babazadeh and Cesare Pautasso
The Role of Platform Boundary Resources in Software Ecosystems: A Case Study ................................................................................................................................................................................. 11
  Vittorio Dal Bianco, Varvana Myllärniemi, Marko Komssi, and Mikko Raatikainen
A Journey through the Land of Model-View-Design Patterns ................................................................ 21
  Artem Syromiatnikov and Danny Weyns
Deriving Component Interfaces after a Restructuring of a Legacy System ................................................ 31
  Abderrahmane Seriai, Salah Sadou, Houari Sahraoui, and Salma Hamza
Green Architectural Tactics for the Cloud ................................................................................................... 41
  Giuseppe Procaccianti, Patricia Lago, and Grace A. Lewis
Lessons Learned from Safety-Critical Software-Based Automation Architectures of Nuclear Power Plants ..................................................................................................................................................... 45
  Eero Uusitalo, Mikko Raatikainen, Mika Koskela, Varvana Myllärniemi, and Tomi Männistö
Scalability of Ecosystem Architectures ...................................................................................................... 49
  Simone da Silva Amorim, Eduardo Santana de Almeida, and John D. McGregor
Sustaining Agility through Architecture: Experiences from a Joint Research
and Development Laboratory .................................................................53
   Balthasar Weitzel, Dominik Rost, and Mathias Scheffe

Software Architecture for Runtime Adaptation
A Flexible Framework for Runtime Monitoring of System-of-Systems
Architectures ..........................................................................................57
   Michael Vierhauser, Rick Rabiser, Paul Grünbacher, Christian Danner,
   Stefan Wallner, and Helmut Zeisel

Scapegoat: An Adaptive Monitoring Framework for Component-Based
Systems ....................................................................................................67
   Inti Gonzalez-Herrera, Johann Bourcier, Erwan Daubert, Walter Rudametkin,
   Olivier Barais, François Fouquet, and Jean-Marc Jézéquel

Consistent Runtime Evolution of Service-Based Business Processes ................77
   Luciano Baresi, Sam Guinea, and Valerio Panzica La Manna

Architecture Adaptation Based on Belief Inaccuracy Estimation ........................87
   Rima Al Ali, Tomas Bures, Ilias Gerostathopoulos, Jaroslav Keznikl,
   and Frantisek Plasil

Architecting Self-Aware Software Systems ............................................91
   Funmilade Faniyi, Peter R. Lewis, Rami Bahsoon, and Xin Yao

Software Architecture Analysis and Evaluation
Automatic Reference Architecture Conformance Checking for SOA-Based
Software Systems ..................................................................................95
   Rainer Weinreich and Georg Buchgeher

Evaluating a Representational State Transfer (REST) Architecture: What is
the Impact of REST in My Architecture? ..............................................105
   Bruno Costa, Paulo F. Pires, Flávia C. Delicato, and Paulo Merson

Software Architecture Evaluation in Practice: Retrospective on More Than 50
Architecture Evaluations in Industry ....................................................115
   Jens Knodel and Matthias Naab

A Recoverability-Oriented Analysis for Operations on Cloud Applications ........125
   Min Fu, Liming Zhu, Len Bass, and Xiwei Xu

Software Architecture Modeling
Component-Aware Triggered Scenarios ................................................129
   Ivo Krka and Nenad Medvidovic
Processing the Evolution of Quality Requirements of Web Service Orchestrations: A Pattern-Based Approach .................................................................139
    Tarek Zernadji, Chouki Tibermacine, and Foudil Cherif

Consolidating a Process for the Design, Representation, and Evaluation of Reference Architectures .................................................................143
    Elisa Y. Nakagawa, Milena Guessi, José C. Maldonado, Daniel Feitosa, and Flavio Oquendo

Inconsistency Resolution in Merging Versions of Architectural Models ..................................................153
    Hoa Khanh Dam, Alexander Reder, and Alexander Egyed

Cumulative Software Architecture Development .......................................................................................163
    Eric J. Braude

Towards a Reference Architecture to Provision Tools as a Service for Global Software Development .................................................................167
    Muhammad Aufeef Chauhan and Muhammad Ali Babar

The Functional Architecture Modeling Method Applied on Web Browsers ...............................................171
    Wilbert Seele, Shaheen Syed, and Sjaak Brinkkemper

Software Architecture Decisions and Knowledge Management

Architectural Decisions for HW/SW Partitioning Based on Multiple Extra-Functional Properties .................................................................175
    Gaetana Sapienza, Ivica Crnkovic, and Pasqualina Potena

A Study on Group Decision-Making in Software Architecture ..................................................................185
    V. Smrithi Rekhav and Henry Muccini

Towards an Evidence-Based Understanding of Emergence of Architecture through Continuous Refactoring in Agile Software Development .................................................................195
    Lianping Chen and Muhammad Ali Babar

A Dynamic Software Product Line Architecture for Prepackaged Expert Analytics: Enabling Efficient Capture, Reuse and Adaptation of Operational Knowledge .................................................................................205
    Karen Smiley, Shakeel Mahate, and Paul Wood

The Supportive Effect of Traceability Links in Architecture-Level Software Understanding: Two Controlled Experiments .................................................................................................................................215
    Muhammad Atif Javed and Uwe Zdun

Industrial Implementation of a Documentation Framework for Architectural Decisions .................................................................225
    Christian Manteuffel, Dan Tofan, Heiko Koziolek, Thomas Goldschmidt, and Paris Avgeriou

Model-Based Formalization of Software Architecture Knowledge .................................................................................235
    Daniel Perovich and María Cecilia Bastarrica
Empirical Study of Architectural Knowledge Management Practices ....................................................... 239
  Matthias Galster and Muhammad Ali Babar
Agile Software Architecture in Advanced Data Analytics ................................................................. 243
  K. Eric Harper and Aldo Dagnino
Architecting in Networked Organizations ......................................................................................... 247
  Damian A. Tamburri, Patricia Lago, Christoph Dorn, and Rich Hilliard
Architecture Description Leveraging Model Driven Engineering and Semantic Wikis ......................... 251
  Alessandro Baroni, Henry Muccini, Ivano Malavolta, and Eoin Woods
Systematic Architectural Decision Management, A Process-Based Approach ................................. 255
  Ana Dragomir, Horst Lichter, and Tiberiu Budau

Author Index ............................................................................................................................................ 259