Transactions on Aspect-Oriented Software Development IV
Volume IV of Transactions on Aspect-Oriented Software Development continues the special issue on Early Aspects from volume III. The special issue was guest edited by João Araújo and Elisa Baniassad and handled by one of the co-editors-in-chief, Mehmet Aksit. The papers in volume III discussed topics pertaining to analysis, visualisation, conflict identification and composition of Early Aspects. The papers in this volume focus on mapping of Early Aspects across the software lifecycle. Complementing this focus on aspect mapping is a special section on Aspects and Software Evolution guest edited by Walter Cazzola, Shigeru Chiba and Gunter Saake—the co-editor-in-chief handling this issue was Awais Rashid.

We wish to thank the guest editors for their commitment and effort in producing such a high quality volume. We also thank the editorial board for their continued guidance, commitment and input on the policies of the journal, the choice of special issues as well as associate-editorship of submitted articles. Thanks are also due to the reviewers who volunteered time amidst their busy schedules to help realize this volume. Most importantly, we wish to thank the authors who have submitted papers to the journal so far, for their contributions maintain the high quality of Transactions on AOSD.

There are two other special issues on the horizon. One focuses on aspects, dependencies and interactions (guest editors: Ruzanna Chitchyan, Johan Fabry, Shmuel Katz and Arend Rensink) for which the call for papers has closed and the papers are currently in the review phase. There is an open call for papers for a special issue on aspects and model-driven engineering (guest editors: Jean-Marc Jezequel and Robert France). The call will close on 15 November 2007. These special issues coupled with the regular submissions to the journal mean that we have a number of exciting papers to look forward to in future volumes of Transactions on AOSD.

There are also important changes afoot at the journal. At the last editorial board meeting Don Batory and Dave Thomas volunteered to step down from the editorial board. Their input and guidance were invaluable in the start-up period of the journal. Don was also a very active and conscientious associate editor. We thank them both for their contributions. At the same time, we welcome Bill Harrison, Oege de Moor and Shriram Krishnamurthi to the editorial board and look forward to working with them.

Another major change involves the co-editors-in-chief. As per the journal policy, one of the founding co-editors-in-chief, Mehmet Aksit, is stepping down after the first two years of the journal. So this is the last volume Mehmet will be co-editing in this role. Needless to say, Mehmet has been instrumental in the successful launch of the journal and its operations to date and the editorial board is most grateful for his efforts and contributions. We do not lose Mehmet although as he will remain on the editorial board and continue to guide us.

At the same time, it is with great pleasure we welcome Harold Ossher who will be taking over from Mehmet as co-editor-in-chief. Harold’s name needs no introduction in the AOSD and software engineering communities. His work on subject-oriented
programming laid the early foundations of AOSD and, subsequently, his work on multi-dimensional separation of concerns has been fundamental in influencing how we perceive the notion of aspects. The journal will continue to flourish under his guidance and leadership and we feel that the future for both the journal and the AOSD community at large is very bright.

Awais Rashid and Mehmet Aksit
Co-editors-in-chief
Organization

Editorial Board

Mehmet Aksit, University of Twente
Shigeru Chiba, Tokyo Institute of Technology
Siobhán Clarke, Trinity College Dublin
Theo D’Hondt, Vrije Universiteit Brussel
Robert Filman, Google
Bill Harrison, Trinity College Dublin
Shmuel Katz, Technion-Israel Institute of Technology
Shriram Krishnamurthi, Brown University
Gregor Kiczales, University of British Columbia
Karl Lieberherr, Northeastern University
Mira Mezini, University of Darmstadt
Oege de Moor, University of Oxford
Ana Moreira, New University of Lisbon
Linda Northrop, Software Engineering Institute
Harold Ossher, IBM Research
Awais Rashid, Lancaster University
Douglas Schmidt, Vanderbilt University

List of Reviewers

Jonathan Aldrich
João Araújo
Don Batory
Klaas van den Berg
Lodewijk Bergmans
Jean Bézivin
Gordon Blair
Johan Brichau
Shigeru Chiba
Ruzanna Chitchyan
Paul Clements
Yvonne Coady
Arie van Deursen
Erik Ernst
Robert Filman
Lidia Fuentes
Alessandro Garcia
Sudipto Ghosh
Jeff Gray
Michael Haupt
Bill Harrison
Robert Hirschfeld
Jean-Marc Jézéquel
Gregor Kiczales
Günter Kniesel
Thomas Ledoux
Cristina Lopes
Roberto Lopez-Herrejon
David Lorenz
Hidehiko Masuhara
Ana Moreira
Klaus Ostermann
Martin Robillard
Americo Sampaio
Christa Schwannninger
Dominik Stein
Mario Südholz
Eric Tanter
Gabriele Tänzer
Peri Tarr
Bedir Tekinerdogan
Emiliano Tramontana
Ian Welch
Jon Whittle
Table of Contents

Focus: Early Aspects – Mapping Across the Lifecycle

Guest Editors’ Introduction: Early Aspects—Mapping Across the Lifecycle ........................................................... 1
   João Araújo and Elisa Baniassad

COMPASS: Composition-Centric Mapping of Aspectual Requirements to Architecture ......................................................... 3
   Ruzanna Chitchyan, Mónica Pinto, Awais Rashid, and Lidia Fuentes

Aspects at the Right Time ........................................................................ 54
   Pablo Sánchez, Lidia Fuentes, Andrew Jackson, and Siobhán Clarke

Focus: Aspects and Software Evolution

Guest Editors’ Introduction: Aspects and Software Evolution ............. 114
   Walter Cazzola, Shigeru Chiba, and Gunter Saake

Extracting and Evolving Code in Product Lines with Aspect-Oriented Programming ................................................................. 117
   Vander Alves, Pedro Matos Jr., Leonardo Cole,
   Alexandre Vasconcelos, Paulo Borba, and Geber Ramalho

A Survey of Automated Code-Level Aspect Mining Techniques ........ 143
   Andy Kellens, Kim Mens, and Paolo Tonella

Safe and Sound Evolution with SONAR: Sustainable Optimization and Navigation with Aspects for System-Wide Reconciliation ............... 163
   Chunjian Robin Liu, Celina Gibbs, and Yvonne Coady

Author Index ...................................................................................... 191