Preface

ECOOP is the premier forum in Europe for bringing together practitioners, researchers, and students to share their ideas and experiences in a broad range of disciplines woven with the common thread of object technology. It is a collage of events, including outstanding invited speakers, carefully refereed technical papers, practitioner reports reflecting real-world experience, panels, topic-focused workshops, demonstrations, and an interactive posters session.

The 18th ECOOP 2004 conference held during June 14–18, 2004 in Oslo, Norway represented another year of continued success in object-oriented programming, both as a topic of academic study and as a vehicle for industrial software development. Object-oriented technology has come of age; it is now the commonly established method for most software projects. However, an expanding field of applications and new technological challenges provide a strong demand for research in foundations, design and programming methods, as well as implementation techniques. There is also an increasing interest in the integration of object-orientation with other software development techniques. We anticipate therefore that object-oriented programming will be a fruitful subject of research for many years to come.

This year, the program committee received 132 submissions, of which 25 were accepted for publication after a thorough reviewing process. Every paper received at least 4 reviews. Papers were evaluated based on relevance, significance, clarity, originality, and correctness. The topics covered include: programming concepts, program analysis, software engineering, aspects and components, middleware, verification, systems and implementation techniques. These were complemented by two invited talks, from Matthias Felleisen and Tom Henzinger. Their titles and abstracts are also included in these proceedings.

The success of a major conference such as ECOOP is due to the dedication of many people. I would like to thank the authors for submitting a high number of quality papers; selecting a subset of papers to be published from these was not easy. I would also like to thank the 22 members of the program committee for producing careful reviews, and for sometimes lengthy discussions during the program committee meeting, which was held February 5th and 6th in Lausanne. I thank the general chair of the conference, Birger Møller-Pedersen, and the local organizer, Arne Maus, for productive collaborations in planning the conference and for helping on a number of logistical issues. The AITO Executive Board gave useful guidance. Richard van de Stadt provided invaluable computerassisted support for the electronic reviewing process, the PC meeting, as well as the production of these proceedings. Finally, Yvette Dubuis at EPFL provided administrative and logistic assistance for running the PC meeting.

April 2004

Martin Odersky

Organization

ECOOP 2004 was organized by the University of Oslo, the Norwegian Computing Center and Sintef, under the auspices of AITO (Association Internationale pour les Technologies Objets), and in cooperation with ACM SIGPLAN.



Executive Committee

Conference Chair Birger Møller-Pedersen (University of Oslo) Program Chair Martin Odersky (École Polytechnique Fédérale de Lausanne) Organizing Chair Arne Maus (University of Oslo)

Organizing Committee

Workshop Chairs Jacques Malenfant (Université Pierre et Marie Curie) Biarte M. Østvold (Norwegian Computing Center) **Tutorial Chairs** Arne-Jørgen Berre (Sintef) Hanspeter Mössenböck (Johannes Kepler Universität) PhD Workshop/Doctoral Symposium Chairs Susanne Jucknath (Technische Universität Berlin) Eric Jul (University of Copenhagen) Poster/Exhibition/Demonstration Chair Ole Smørdal (University of Oslo) Practitioners' Reports Chair Egil P. Andersen (DNV Software) Memorial Exhibition Håvard Hegna (Norwegian Computing Center) Room Allocation Stein Krogdahl (University of Oslo) Treasurer Øystein Haugen (University of Oslo) Webmaster, Student Volunteers Dag Langmyhr (University of Oslo)

Program Committee

Uwe Assmann Linköpings Universitet, Sweden Don Batory University of Texas at Austin, USA Gilad Bracha Sun Microsystems, USA Luca Cardelli Microsoft Research Cambridge, UK Charles Consel LaBRI/INRIA, France École Normale Supérieure, France Giuseppe Castagna Peter Dickman University of Glasgow, UK Sophia Drossopoulou Imperial College, UK Erik Ernst University of Aarhus, Denmark Manuel Fähndrich Microsoft Research, USA Giovanna Guerrini University of Pisa, Italy Urs Hölzle Google, USA Mehdi Jazaveri Technical University of Vienna, Austria Shriram Krishnamurthi Brown University, USA Doug Lea SUNY Oswego, USA Mira Mezini Darmstadt University of Technology, Germany Oscar Nierstrasz University of Bern, Switzerland Atushi Ohori JAIST, Japan Douglas Schmidt Vanderbilt University, USA Luís Rodrigues Universidade de Lisboa, Portugal Clemens Szyperski Microsoft Research, USA Philip Wadler University of Edinburgh, UK

Referees

Peter von der Ahé Jonathan Aldrich Eric Allen Davide Ancona Christopher Anderson Pedro Antunes Filipe Araujo Gabriela Arévalo Kenichi Asai David F. Bacon Thomas Ball Véronique Benzaken Alexandre Bergel Lorenzo Bettini Andrew P. Black Viviana Bono Ruth Breu Kim Bruce Michele Bugliesi João Cachopo Denis Caromel Luis Carriço Robert Chatley Yoonsik Cheon Jong-Deok Choi Dave Clarke Gregory Cobena Alessandro Coglio Dario Colazzo Alexandre di Costanzo William Cook Greg Cooper Erik Corry Manuvir Das Rob DeLine Giorgio Delzanno Amer Diwan Damien Doligez Alan Donovan Karel Driesen Stéphane Ducasse Dominic Duggan Michael Eichberg Susan Eisenbach

Sonia Fagorzi Pascal Fenkam Robby Findler Bernd Fischer Kathleen Fisher Markus G"alli Jacques Garrigue Tudor Girba Patrice Godefroid Georges Gonthier Mark Grechanik Orla Greevy Thomas Gschwind Masahito Hasegawa Johannes Henkel Michael Hind Tom Hirschowitz Pete Hopkins Haruo Hosova Jim Hugunin Atsushi Igarashi Paul Kelly Graham Kirby Günter Kniesel Juliana Küster-Filipe Giovanni Lagorio Patrick Lam Michele Lanza James Larus Rustan Leino Dan Licata Adrian Lienhard Jørgen Lindskov Knudsen Roberto Lopez-Herrejon Darko Marinov Francisco Martins Brian McNamara Erik Meijer Marco Mesiti Todd Millstein Hugo Miranda Kjeld H. Mortensen Gilles Muller Curran Nachbar

Markus Noga Isabel Nunes Robert O'Callahan Klaus Ostermann Ulrik Pagh Schultz Jens Palsberg David Pearce João Pedro Neto Randy Pollack Laura Ponisio Seth Proctor Shaz Qadeer Sean Quinlan Gianna Reggio Jakob Rehof Geral Reif Lukas Renggli Martin Rinard António Rito-Silva Kenneth Russell Alexandru Salcianu Don Sannella Nathanael Schärli

Michael I. Schwartzbach Nahid Shahmehri Yannis Smaragdakis V.C. Sreedhar John Tang Boyland Tachio Terauchi Peter Thiemann Michel Tilman Mads Torgersen Vasco T. Vasconcelos Jan Vitek Aino Vonge Corry Jérôme Vouillon David Walker Dan Wallach Stephanie Weirich Lisa Wells Toshiaki Yasue Masahiro Yasugi Steve Zdancewic Ying Zhang Elena Zucca