Preface

This volume of ENTCS contains papers from the Resource Aware Computing Workshop (RAC2016, http://resourceanalysis.cs.ru.nl/rac2016/) that was held in Eindhoven on April 2, 2016. The workshop was part of the European Joint Conferences on Theory and Practice of Software (ETAPS) which is the primary European forum for academic and industrial researchers working on topics relating to Software Science. ETAPS, established in 1998, is a confederation of five main annual conferences (ESOP, FASE, FOSSACS, POST and TACAS) accompanied by satellite workshops and other events. The nineteenth edition, ETAPS 2016, took place in Eindhoven, The Netherlands. The RAC 2016 workshop was one of the satellite workshops.

Aim of the RAC workshop

The area of Resource Aware Computing grew out from several research results to use modelling techniques and static analysis techniques to derive upper bounds for consumption of resources such as time, space and energy. RAC's aim is to bring together researchers on timing awareness and other resource awareness such as memory and energy. The RAC workshop relates to earlier Foundational and Practical Aspects of Resource Analysis (FOPARA) workshop series (e.g. FOPARA2015 at ETAPS2015 held jointly with DICE). Where FOPARA focusses on analysis only, RAC considers the whole area of resource aware computing. Related is also the Energy Aware Computing (EACO) workshop series at the University of Bristol (http://www.cs.bris.ac.uk/Research/eaco/).

Programme Committee

Experts in the field of resource aware computing were invited by the Programme Committee Chairs to serve in the international Programme Committee of the 2016 Resource Aware Computing workshop. The full list of Programme Committee Members is given below. Each papers was assigned to at least three reviewers from the Programme Committee. Reviews were done in accordance with international standards for scientific publication quality. Out of five submissions two papers were selected for publication. These two papers form the core of this special issue.

Programme Committee RAC 2016

Marko van Eekelen	Radboud University and Open University, NL, Chair
Kerstin Eder	University of Bristol, UK, Co-chair
Elvira Albert	University Complutense Madrid, Spain
Clemens Grelck	University of Amsterdam, NL
Kevin Hammond	University of St. Andrews, UK
Martin Hofmann	LMU, Munich, Germany
Timo Hönig	University of Erlangen-Nürnberg, Germany
Thomas Jensen	INRIA, Rennes, France
Steve Kerrison	University of Bristol, UK
Ugo Dal Lago	University of Bologna, Italy
Kim Larsen	Aalborg University, Denmark
Björn Lisper	Mälardalen University, Sweden
Hans-Wolfgang Loidl	Heriot-Watt University, UK
Kenneth MacKenzie	University of Edinburgh, UK
Jean-Yves Marion	University of Lorraine, France
Greg Michaelson	Heriot-Watt University, Edinburgh, UK
Georg Moser	University of Innsbruck, Austria
Romain Péchoux	University of Lorraine, France
Ricardo Peña	University Complutense Madrid, Spain
Luca Roversi	University of Turin, Italy
Aleksy Schubert	Warsaw University, Poland
Simon Wegener	AbsInt Angewandte Informatik GmbH, Germany

Support

The RAC 2016 Workshop was supported by the European Union via ICT COST Action IC1202: Timing Analysis on Code LEvel (TACLE).

Topics

The RAC workshop aims to serve as a forum for presenting original research results that are relevant to resource aware computing and the analysis of resource (e.g. time, space, energy) consumption by computer programs. The workshop brings together those researchers that work on foundational issues with those researchers that focus more on practical results. Therefore, both theoretical and practical contributions are encouraged. Also encouraged were papers that combine theory and practice. The following list of topics is typical but non-exhaustive for the workshop area:

- techniques and experience with time aware computing
- memory aware computing and energy aware computing
- models for resource aware computing in general or for a specific resource in particular

- resource static analysis for embedded or/and critical systems

- type systems for controlling/inferring/checking resource consumption

- semantic methods to analyse resources, including quasi-interpretations

- practical applications of resource analysis

Workshop Programme

Apart from presentations of the published papers in this volume, the programme of the workshop elicited lively discussions on the topic of Resource Aware Computing. There were about twenty participants which all contributed significantly to these discussions.

The programme started with a presentation, followed by a discussion, of ongoing work by Simon Wegener, Thomas Ballenthin, Boris Dreyer and Alexander Weiss from TU Darmstadt and AbsInt Angewandte Informatik GmbH, Germany on *Hardware Support for Histogram-based Performance Analysis*.

This was followed by a very lively discussion led by Clemens Grelck and Sebastian Altmeyer from the University of Amsterdam, The Netherlands. The purpose of the discussion was to see whether a common ground could be found for researchers throughout Europe to create a specialised community in the area of Resource Aware Computing. After two rounds of discussions, one in the morning and one in the afternoon, consensus grew that *Parallel Resource Aware Computing* might be a good starting point for forming a community which is both large enough and specialised enough while having the potential to have a significant impact on industrial applications.

The core of the RAC workshop were the two presentations of the publications of this volume: Jeremie Salvucci and Emmanuel Chailloux from UPMC Université Pierre et Marie Curie, Paris 06, France on *Memory consumption analysis for a functional and imperative language* and John Magnus Morton, Patrick Maier and Phil Trinder from the University of Glasgow, United Kingdom on *JIT-Based Cost Analysis for Dynamic Program Transformations*.

Another highlight of the workshop was created by Christoph Bockisch from Philipps Universität Marburg, Germany. He presented an inspiring invited keynote by giving an overview on the topic of *Energy-Awareness in Software Engineering*.

The Future of RAC

As to the future of the RAC workshop: the liveliness of the discussions during the workshop seems to warrant the effort of organising another RAC event in the future. No decisions have yet been made on the location or timing of the next RAC workshop. Suggestions are invited. All volunteer organizers and hosts are strongly encouraged to come forward.

Marko van Eekelen
Kerstin Eder