

SEEFM05

**2nd SOUTH-EAST EUROPEAN WORKSHOP
IN FORMAL METHODS**

Edited by
George Eleftherakis

SEEFM05

**2nd SOUTH-EAST EUROPEAN WORKSHOP
IN FORMAL METHODS**

Workshop organised by the
SOUTH-EAST EUROPEAN RESEARCH CENTRE
(SEERC)

ISBN 960-87869-8-3
Copyright: June 2006

© SOUTH-EAST EUROPEAN RESEARCH CENTRE
17 Mitropoleos Str., 54624 Thessaloniki
Tel:++302310.253477-8, Fax:++302310.253478
<http://www.seerc.info/>

Table of Contents

"Ten Commandments Ten Years On: An Assessment of Formal Methods Usage", J.P. Bowen and M.G. Hinchey	1
"Applying model-checking techniques to verify fault-tolerant Erlang code", J. Derrick, C.B. Earle, and S. Thompson	17
"Implementing a New International Paper Mill Efficiency Standard - Using Computational Correctness Criteria to Model and Verify Timed Events", J. Veijalainen, E. Berki, J. Lehmonen, P. Moisanen	27
"An Operating Guideline Approach to the SOA", P. Massuthe, W. Reisig, and K. Schmidt	44
"Formalization of Modeling, Analysis and Testing of Interactive Systems using Statecharts", F. Belli, Ch.J. Budnik, A. Hollmann	59
"Using a formal method to model software design in XP projects", C. Thomson and M. Holcombe	74
"Object-based language for generalized state machines", D. Dranidis, G. Eleftherakis, and P. Kefalas	89
"Dynamic aspects of retrenchments through temporal logic", R. Banach, J.-P. Bodeveix, M. Filali, M. Poppleton	104
"Binding Network Topologies to Specifications via Pronouns", C. Bazilio, E.H. Haeusler, and M. Endler	119
"Active Learning Facilitates Success of Formal Methods in Practice", V.V. Kuliamin, V.A. Omelchenko, O.L. Petrenko	132
"Application of the timed automata abstraction to the performance evaluation of the architecture of a bank on-line transaction processing system", M. Kourkouli, G. Hassapis	142
"A Verification Environment for Imperative and Functional Programs in the Theorema system", L.I. Kovacs, N. Popov, T. Jebelean	154
"Improving Formal Methods' Tools Usability", V. Vujosevic and G. Eleftherakis	169
"A Timed B Method for Modelling Real Time Reactive Systems", M. Rached, J.-P. Bodeveix, M. Filali, O. Nasr	181
"A Formal Model for Performance Assessment in a Simulative Environment", M. Barth	196
"Algebraic model for the JK flip-flop behaviour", A. Vasilescu	209
"Object-oriented workflow formalization", T. Bouabana-Tebibel and M. Belmesk	224
"Context-free grammar for a two-dimensional language", C. Luca	239
"Problem Solving with Different Models", O. Georgescu	247

FOREWORD

The 2nd South-East European Workshop in Formal Methods took place in Ohrid on the 18th – 19th of November 2005. SEEFM05 was organised by SEERC and CITY College and locally organised by Sts. Cyril and Methodius University and hosted at Metropol hotel in Ohrid. The event was sponsored by BCS-FACS group.

The workshop has attracted participation from scientists, academics and researchers from Institutes and Universities all over the world, but especially from Europe. More specifically, out of the 17 papers accepted for presentation (10 full papers and 7 discussion papers), 3 of them were from Greece, 3 from Romania, 3 from Germany, 2 from France, and 1 from UK, Finland, Austria, Russia, Brazil, Algeria. We also had two invited papers from UK. In 8 papers, at least one author is related to SE Europe.

Registration was free. There were 48 people registered for the workshop. The nationalities of the participants are as follows: FYRoM 15, Greece 8, UK 6, Romania 5, Germany 3, France 3, Algeria 1, Turkey 1, Hungary 1, Bulgaria 1, Serbia & Montenegro 1, Slovenia 1, Russia 1, Brazil 1 and others.

The event commenced by welcome speeches from Dr.G.Eleftherakis co-chair of SEEFM05 and Dr.P.Ketikidis, Vice-Principal of CITY College and Director of SEERC. Both expressed their satisfaction about the number of participants and their willingness to find ways of promoting and organizing similar workshops in the future as well as establishing links between academics in this research area in South-East European states.

Prof.J.Bowen from the University of London South Bank and Prof.J.Derrick from the University of Sheffield were the *invited speakers*. Prof.J.Bowen (chair of BCS-FACS) re-examined the original ten important requirements (or “commandments”) for formal developers to consider and follow, based on knowledge of several industrial application success stories, considering their validity in the light of a further decade of industrial best practice and experiences. Prof.J.Derrick described recent work which seeks to apply model-checking techniques to the verification of Erlang code.

There were three sessions that followed. Session A and C were presentations of full papers and session B was presentation of discussion papers. Session A was more on applied formal methods. Session B and Session C were on theoretical foundations, verification and tools. All papers were very interesting and raised stimulating discussions among the participants. Each presentation of full paper lasted for 20 minutes allowing 5 minutes for questions and each presentation of discussion paper lasted for 10 minutes allowing 10 minutes of questions and discussion.

At the end, there was a *panel discussion*, which also involved questioning from the participants, chaired by Dr.G.Eleftherakis, on the general topic: “Formal Methods, Practical dimensions: Challenges in the business world”. The panel consisted of Prof.J.Bowen (UK), Prof.J.Derrick (UK), Prof.W.Reisig (Germany) and Dr.E.Berki (Finland). The outcomes of this discussion are summarized as follows:

- Formal methods is a hot research area but there is still no evidence of wide acceptance
- Industry needs to be convinced about the importance of using Formal Methods

- Participants from the industry should be invited to express their opinion
- Researchers from South-East Europe should join the existing formal methods organizations in Europe.
- Education on Formal Methods should be provided to students who will identify the future needs of the industry
- The particular characteristics of people in SEE could be identified and due to their strong mathematical background, there might be a chance there to use these people in disseminating the practice on Formal Methods
- The workshop provided a good chance to establish strong links between academics in SEE countries and those links should be exploited.

SEEFM05 was once more a satellite workshop of the Balkan Conference in Informatics (2nd). A number of selected papers were peer reviewed once more and included in a post-proceedings volume in the 2005, Vol 1, No 3 issue of the International Journal Annals of Mathematics, Computing and Teleinformatics (AMCT).

Best Paper / Student presentation prizes, sponsored by BCS-FACS, of one year's FACS membership and one year's subscription to the FAC journal were awarded based on a voting procedure between all the participants. Best Paper presentation was awarded to Prof. W.Reisig and Best Student presentation prize to Ms. Laura I.Kovacs.

The workshop included a gala-dinner in a traditional restaurant in Ohrid offered to all the participants of SEEFM05.

Conclusions

- The workshop was the second attempt to bring people from SEE together, based on their common interest in Formal Methods.
- All participants expressed the opinion that the workshop is to be continued on a biannual basis.
- It is thought that the workshop could be hosted in Thessaloniki every second time and the other in other interested parties (e.g. Timisoara, Romania).
- The Steering Committee could be extended keeping it still small and flexible.
- A web page under SEEFM page (www.seeefm.info) containing all links and email addresses of people in SEE should be constructed as a means to disseminate information and practices. The page should initially contain info collected in the two workshops, e.g. people, institutions, research groups, interests, projects, tools, courses etc.
- Common projects should be sought between various institutions in SEE with common research interests in Formal Methods
- Every effort should be made to involve people from industry.

Closing I would like to personally thank you all, the organizing and programme committee, the invited speakers, the authors of the papers, the presenters, the reviewers, the participants, all my colleagues and the students in the CS department at CITY that actively participated, the local organizing committee. Your effort made the 2nd SEEFM a very successful event.

George Eleftherakis
 Editor
 Co-Chair of SEEFM05

COMMITTEES

PROGRAMME CO-CHAIRS

- G. Eleftherakis (City College)
- K. Zdravkova (Sts. Cyril and Methodius University)

PROGRAMME COMMITTEE

- T. Balanescu (University of Pitesti)
- F. Belli (University of Paderborn)
- E. Berki (University of Jyvaskyla)
- N. Bogunovic (University of Zagreb)
- C. Calude (University of Auckland)
- G. Ciobanu (Romanian Academy of Sciences)
- A. Cowling (University of Sheffield)
- J. Derrick (University of Sheffield)
- D. Dranidis (City College)
- A. Eskenazi (Bulgarian Academy of Sciences)
- H. Georgescu (University of Bucharest)
- M. Gheorghe (University of Sheffield)
- D. Guelev (Bulgarian Academy of Sciences)
- J. Hall (Open University, UK)
- C. Hartonas (TEI Larissa)
- M. Holcombe (University of Sheffield)
- F. Ipate (University of Pitesti)
- M. Ivanovic (University of Novi Sad)
- T. Jebelean (Johannes Kepler University, Institute e-Austria)
- T. Kapus (University of Maribor)
- P. Kefalas (CITY college)
- E. Kehris (TEI Serres)
- D. Kleftouris (TEI Thessaloniki)
- H. Oguztuzun (Middle East Technical University)
- A. Sotiriadou (City College)
- I. Stamelos (Aristotle University Thessaloniki)
- M. Ufuk Caglayan (Bogazici University)
- M. Velev (Reservoir Labs)
- M. Wirsing (Ludwig-Maximilians University of Munich)
- H. Yenigun (Sabanci University)

LOCAL ORGANISING COMMITTEE

- Margita Kon-Popovska (Sts. Cyril and Methodius University)

SECRETARIAT

- I. Stamatopoulou (SEERC, Greece)

Acknowledgements

This book is the final product of the 2nd South East European Workshop on Formal Methods (SEEFM05) with theme: "Practical dimensions: Challenges in the business world" which took place in Ohrid on November 2005. It is the result of a collective effort and I would like to take this opportunity to express my appreciation to the people involved. First of all, I would like to thank the Organising and Programme Committees as well all the authors, speakers, reviewers and participants whose contributions to the workshop made it a success.

The event contributes directly to the mission of the South East European Research Centre (SEERC), which is to support the development of South East Europe by conducting pure and applied research in and for the region. To accomplish this, SEERC employs the research capacities of the University of Sheffield and CITY Liberal Studies, facilitating collaborations between their research staff and developing networks of researchers from across South-East Europe.

I am most grateful to the Vice Chancellor of the University of Sheffield, Professor Robert Boucher and the Pro-Vice Chancellor Professor Tony Crook as well as to Mr. Yiannis Ververidis, Principal of CITY Liberal Studies, for supporting the development of academic research expertise and for investing in research efforts that have a direct impact on policy recommendations for the countries of the South East European region.

I would also like to express my appreciation to the Programme Chairs, Dr. George Eleftherakis from CITY Liberal Studies and Dr. Katerina Zdravkova from Sts. Cyril and Methodius University as well as to the two invited keynote speakers, Professor Jonathan Bowen (London South Bank University) and Professor John Derrick (University of Sheffield).

I would like to thank all colleagues from the Computer Science Department of CITY Liberal Studies and SEERC for devoting a lot of valuable personal time to the organization of this event making this workshop the second successful event in the series.

Finally, I would like to warmly thank our sponsors, CITY Liberal Studies, SEERC and BCS-FACS. Without their support this event would not be possible.

Panayiotis H. Ketikidis, Ph.D.
Chairman – SEERC Management Committee
Vice Principal – CITY Liberal Studies

