Editorial

We are proud to present the 5th Formal Aspects of Computing Special Issue on Refinement, originating from the 14th BCS-FACS Refinement Workshop, held at Eindhoven in November 2009 as part of the Formal Methods Week around the FM2009 conference.

The workshop proceedings have appeared in Electronic Notes in Theoretical Computer Science vol. 259(1). After the workshop, presenters were invited to submit significantly extended papers for inclusion in this special issue. Six of the accepted papers are included here; the remaining are due to appear later.

Carrol Morgan's invited talk "How to brew up a refinement ordering" was very well received at the workshop. These ideas were developed further, concentrating on the noninterference aspects, in the paper included here: "Compositional noninterference from first principles".

"Formalizing a hierarchical file system" by Wim H. Hesselink and Muhammad Ikram Lali presents the derivation of a pointer implementation from an abstract specification in terms of partial functions, which is completely supported by mechanised proofs (in PVS).

"Emergence and refinement" by J. W. Sanders and Graeme Smith considers the manner in which formal methods may be used to capture and authenticate the trustworthiness of emergent behaviour. As a demonstration of the approach, an incremental refinement of the 'glider' in Conway's Game of Life is given from its specification.

"Invariant diagrams with data refinement" by Viorel Preoteasa and Ralph-Johan Back describes the use of data refinement in a diagrammatic approach to invariant based programming. It is exemplified by a derivation of the Deutsch-Schorr-Waite graph marking algorithm, which has been mechanically verified using Isabelle/HOL.

"Experiments in program verification using Event-B" by Stefan Hallerstede and Michael Leuschel explores the use of Event-B for sequential programs, analysing strengths and weaknesses and identifying possible evolutions of Event-B.

"Mechanised Support for Sound Refinement Tactics" by Frank Zeyda, Marcel Oliveira and Ana Cavalcanti provides an implementation of the refinement tactic language *ArcAngel* for the *ProofPower* theorem prover. The resulting mechanisation can be used with any programming model for refinement.

We are grateful to 'Formal Aspects of Computing' for allowing us to publish this collection of papers in the journal, and for an ongoing pleasant collaboration; to the participants of the workshop, and to the reviewers involved in selecting the papers.

Following the workshop in Eindhoven, the 15th edition was held in Limerick, again co-located with the FM conference, in June 2011. Papers for a special issue based on this event are under review for inclusion in a later edition of Formal Aspects of Computing. The home page of the workshop series, including its history, can be found at <http://www.refinenet.org.uk>.

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