Preface

The 9th Symposium on Trends in Functional Programming (TFP 2008) is being held in Center Parcs “Het Heijderbos,” The Netherlands near the city of Nijmegen on May 26-28, 2008. It is co-located with the 6th International Summer School on Advanced Functional Programming (AFP 2008). The co-location of these two events is intended to attract new researchers to the exciting area of functional programming. TFP 2008 is organized by the Computer Science Department of the Radboud University Nijmegen. The growing success and internationalization of TFP represents the continuing importance of functional programming and of the TFP policy to encourage new and veteran speakers to present their research work at a friendly forum without first having to go through a strenuous review process. TFP’s post-symposium review policy has lead to a series of symposia with a rich diversity of talks from which a selection of publication-ripe articles are chosen for inclusion in a peer-reviewed volume published by Intellect in its Trends in Functional Programming series. In addition, TFP acknowledges the important role students play in new trends, and every year an article that has a student as the primary author is chosen as the recipient of TFP’s Best Student Paper Award.

This volume represents the articles associated with the work presented at TFP 2008. As in previous versions of TFP it is called the draft proceedings to distinguish it from the formal peer-reviewed post-symposium proceedings. The work presented at TFP 2008 was selected by its international program committee through the screening of extended abstracts and full papers. Allowing authors to submit a full article to the screening process was a minor shift made from previous versions of TFP in order to reduce the number of versions of their articles authors must create. The program committee of TFP 2008 received 33 submissions, divided as follows: 28 research papers (18 full papers, and 10 extended abstracts), 2 position papers (all extended abstracts), and 3 project papers (2 full papers, and 1 extended abstract). Of these submissions, 29 were accepted for presentation.

At the time of printing, approximately 50 researchers, students, and industry professionals have registered to participate in TFP 2008. A quarter of these participants also registered for AFP 2008. TFP 2008 brings together a truly international milieu representing a variety of countries that include Belgium, Brazil, Canada, Denmark, England, France, Germany, Hungary, Ireland, Italy, Norway, Russia, Scotland, Spain, Sweden, The Netherlands, and the USA. In order to foster friendship and collaborations between participants, TFP 2008 follows the TFP tradition of including social events that enable participants to interact in an informal setting. The social events include a visit to the city of Nijmegen, the oldest city of the Netherlands, and the symposium’s dinner at the Waal Riverside in Nijmegen. In addition, we are honored to have two invited speakers (one from academia and one from industry): Henk Barendregt from the Radboud University Nijmegen and Gert Veldhuijzen van Zanten from Getronics Pink Roccade. The venue Center Parcs “Het Heijderbos” is a holiday resort in the woodlands near Nijmegen. Participants share cottages and can use its facilities. We hope that this slightly out-of-the-way location and this arrangement will provide for a stimulating event and environment for all participants.

TFP 2008 gratefully acknowledges the generous support of the following institutions: Getronics Pink Roccade, The Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO), and the Netherlands Defence Academy. We also thank the members of the program and organizing committees for their hard work to make TFP 2008 a success.

Peter Achten, Pieter Koopman, and Marco T. Morazán
Nijmegen, The Netherlands
May 2008
Program Committee

Peter Achten (co-chair)          Radboud University Nijmegen, NL
Andrew Butterfield             Trinity College, IE
Manuel Chakravarty             University of New South Wales, AU
John Clements                  California Polytechnic State University, USA
Matthias Felleisen             Northeastern University, USA
Jurriaan Hage                  Utrecht University, NL
Michael Hanus                  Christian-Albrechts University zu Kiel, DE
Ralf Hinze                     University of Oxford, UK
Graham Hutton                  University of Nottingham, UK
Johan Jeuring                  Utrecht University, NL
Pieter Koopman (co-chair)      Radboud University Nijmegen, NL
Shriram Krishnamurthi          Brown University, USA
Hans-Wolfgang Loidl           Ludwig-Maximilians University München, DE
Rita Loogen                    Philipps-University Marburg, DE
Greg Michaelson                Heriot-Watt University, UK
Marco T. Morazán (symp. chair) Seton Hall University, USA
Sven-Bodo Scholz               University of Hertfordshire, UK
Ulrik Schultz                  University of Southern Denmark, DK
Clara Segura                   University Complutense de Madrid, ES
Olin Shivers                   Northeastern University, USA
Phil Trinder                   Heriot-Watt University, UK
Varmo Vene                     University of Tartu, EE
Viktória Zsók                  Eötvös Loránd University, HU

Symposium Organisation

Symposium chair: Marco T. Morazán (Seton Hall University, USA)
Program chair: Peter Achten, Pieter Koopman (Radboud University Nijmegen, NL)
Treasurer: Greg Michaelson (Heriot-Watt University, UK)
Local arrangements: Simone Meeuwen (Radboud University Nijmegen, NL)

Support

Table of contents

I. Wouter Swierstra, Thorsten Altenkirch.  
Dependent Types for Distributed Arrays

II. Tom Schrijvers, Martin Sulzmann.  
Restoring Confluence for Functional Dependencies

III. Arie Middelkoop, Atze Dijkstra, Doaitse Swierstra.  
A Learner Specification for Generalized Abstract Data Types

IV. Louis-Julien Guillemette, Stefan Monnier.  
One Vote for Type Families in Haskell!

V. Michael Nissen, Ken Friis Larsen.  
{
FunSETL - Functional Reporting for ERP Systems

VI. Ulrik Schultz, Mirko Bordignon, David Christensen, Kasper Stoy.  
A Functional Language for Programming Self-Reconfigurable Robots

VII. Abdallah Al Zain, Phil Trinder, Jost Berthold, Rita Loogen, Kevin Hammond, Hans-Wolfgang Loidl.  
Parallel Functional Middleware for Computational Algebra Systems

VIII. André Rauber Du Bois, Gerson Cavalheiro.  
Design and Implementation of a semi-explicit parallel purely functional language

IX. Oleg Lobachev, Jost Berthold, Mischa Dieterle, Rita Loogen.  
Parallel FFT Using Divide & Conquer Skeletons

X. Vladimir Janjic, Kevin Hammond.  
Prescient Scheduling of Parallel Functional Programs on the Grid

XI. Nik Sculthorpe, Simon Thompson.  
A Certified Refactoring Engine

XII. Huiqing Li, Simon Thompson.  
Clone Detection and Removal for Erlang/OTP within a Refactoring Environment

Optimisation of Dynamic, Hybrid Signal Function Networks

XIV. Wolfgang Jeltsch.  
Improving Push-based FRP

XV. Manuel Montenegro, Ricardo Peña, Clara Segura.  
A Simple Region Inference Algorithm for a First-Order Functional Language

XVI. Alejandro Tamalet, Olha Shakaravska, Marko van Eekelen.  
Size Analysis of Algebraic Data Types

XVII. Brian Campbell.  
Prediction of linear memory usage for first-order functional programs

XVIII. Ryan Ralston.  
ACL2-Certified AVL Trees

XIX. Alexander Green, Thorsten Altenkirch.  
Shor in Haskell - The Quantum IO Monad –

XX. Annette Bieniusa, Peter Thiemann.  
How to CPS Transform a Monad

XXI. Patricia Johann, Neil Ghani.  
Short Cut Fusion of Recursive Programs with Computational Effects

XXII. Neil Brown, Adam T. Sampson.  
Matching and Modifying with Generics

XXIII. Liyang HU, Graham Hutton.  
Implementing Software Transactional Memory, Correctly

XXIV. Emanuele Covino, Giovanni Pani.  
Complexity certification of C++ template metaprogramming
XXV. Graham Hutton, Diana Fulger.  
*Reasoning About Effects: Seeing the Wood Through the Trees*

XXVI. Jocelyn Serot.  
*The Semantics of a Purely Functional Graph Notation System*

XXVII. Mercedes Hidalgo-Herrero, Yolanda Ortega-Mallén.  
*Calculational Reasoning for Parallel Functional Programming*

XXVIII. Máté Tejfel, Tamás Kozsik.  
*An Operational Semantics of Temporal Properties in Functional Programs*

XXIX. Edwin Brady, Christoph Herrmann, Kevin Hammond.  
*Lightweight Invariants with Full Dependent Types*