Typed Lambda Calculi and Applications 2003, Selected Papers

Preface

The present issue of *Fundamenta Informaticae* contains final, revised and expanded, versions of selected papers presented at the 6th International Conference on Typed Lambda Calculi and Applications (TLCA 2003), held in Valencia, Spain, from 10th to 12th June 2003 as part of the Federated Conference on Rewriting, Deduction and Programming (RDP 2003). The conference versions of these articles appeared in Volume 2701 of Springer's LNCS series. The contents of this issue represents the variety of research in the area of typed lambda-calculi and their applications e.g. for programming and automated theorem proving. Although certainly incomplete, this collection documents an important fraction of the progress made in this area in recent years.

The paper of Michael Abbott *et al* belongs to the theory of data types. It explores the analogies between context formation and formal differentiation. Roberto Amadio investigates bounds on program complexity that can be obtained with help of measures (quasi-interpretations) over an extended set of rational numbers. The computational complexity of the synthesis problem for such interpretations is analyzed. Frederic Blanqui's work belongs to the theoretical foundations of proof assistants like Coq. It shows how inductive types can be represented in a calculus of strongly normalizing higher-order rewriting. Elementary Affine Logic as a type assignment system is the subject of the paper by Paolo Coppola and Simona Ronchi Della Rocca. The authors prove a form of principality property and decidability of type inference. The paper by Thierry Coquand *et al* develops a PER model for a system obtained by adding dependently typed records to a logical framework based on Martin-Löf's type theory. Thierry Joly proves the undecidability of the lambda-definability problem over two ground elements, closing the gap between the decidable and undecidable cases. As a by-product, he gives a simple proof of the undecidability of the higher-order matching problem for beta-reductions. Yoshihiko Kakutani and Masahito Hasegawa investigate the categorical semantics of the classical lambda-calculus $\lambda\mu$. The duality between variables and names in $\lambda\mu$ is modeled by biparametrization in polynomial control categories. Jim Laird's paper aims at semantical characterizations of sequentiality, Fully abstract models, based on the notion of a bounded stable biorder, are defined for unary PCF and various other calculi.

The editors would like to express their thanks to all the authors for submitting to *Fundamenta Informaticae*, and to the authors and referees for their prompt cooperation in the preparation of this issue.

Martin Hofmann, University of Munich
Paweł Urzyczyn, Warsaw University
Special Issue Editors