Reflections

on Type Theory, $\lambda$-Calculus, and the Mind

*Essays Dedicated to Henk Barendregt
on the Occasion of his 60th Birthday*
Hendrik Pieter Barendregt
December 18, 2007 was Henk Barendregt’s 60th birthday. To celebrate this event, we
organized a one-day symposium with the title

‘Reflections on Type Theory, λ-Calculus and the Mind’,

which was held on December 17, 2007 at the Radboud University Nijmegen, organised by
Erik Barendsen, Venanzio Capretta, Herman Geuvers, Nicole Messink and Milad Niqui.
The web site associated with the symposium, http://www.cs.ru.nl/barendregt60, gives
an impression of the meeting, an online edition of the present book, and additional material.
The symposium consisted of invited talks by:

- Corrado Böhm
- Mariangiola Dezani-Ciancaglini
- Jan Willem Klop
- Jean-Jacques Lévy
- Giuseppe Longo
- Bill Phillips
- Gordon Plotkin
- Anne Speckens
- Richard Statman

At the symposium, this book was given to Henk Barendregt as a present, to thank him
for all the beautiful results and all the inspiration he has given us.

We solicited papers from all former PhD students of Henk Barendregt. (See below
for a complete list.) These contributions were not required to be scientific papers; also
more ‘informal’ articles could be submitted. These papers have gone through a lightweight
refereeing process, leading to considerable changes and improvements in some of the papers.
Furthermore, the invited speakers for the symposium were asked to contribute a paper,
which some of them did.

This volume celebrates the extraordinary breadth and depth of Henk’s contributions,
and with it we pay tribute to Henk Barendregt as an inspiring scientist, teacher and com-
municator.

We want to thank all authors who have contributed a paper for making this book as
nice as it is. Furthermore, we thank the invited speakers and everybody who participated in
the symposium for making it a success. Finally, we want to acknowledge financial support
from NWO and the Faculty of Science of the Radboud University Nijmegen.

Van harte gefeliciteerd Henk!

The editors,
Erik Barendsen, Venanzio Capretta,
Herman Geuvers, Milad Niqui.
PHD STUDENTS OF HENK BARENDREGT

Throughout the years Henk Barendregt has supervised many PhD students in various universities. Below is a list — in chronological order— of people who obtained their PhD degree with Henk Barendregt as promotor. Included are the title of the theses and the year and place of PhD defence.

1987: R.C. de Vrijer
   *Surjective pairing and strong normalization: two themes in lambda calculus*
   VU University Amsterdam

1988: M.C.J.D. van Eekelen
   *Parallel graph rewriting, some contributions to its theory, its implementation and its application*
   Radboud University Nijmegen

1989: P.H. Hartel
   *Performance analysis of storage management in combinator graph reduction*
   University of Amsterdam

1990: P.W.M. Koopman
   *Functional Programs as Executable Specifications*
   Radboud University Nijmegen

1991: B.P.F. Jacobs
   *Categorical Type Theory*
   Radboud University Nijmegen

1993: L. Helmink
   *Tools for Proofs and Programs*
   University of Amsterdam

1993: S.J. van Bakel
   *Intersection Type Disciplines in Lambda Calculus and Applicative Term Rewriting Systems*
   Radboud University Nijmegen

1993: J.E.W. Smetsers
   *Graph Rewriting and Functional Languages*
   Radboud University Nijmegen

1993: A.J.C. Hurkens
   *Borel Determinacy without the Axiom of Choice*
   Radboud University Nijmegen

1993: J.H. Geuvers
   *Logics and Type Systems*
   Radboud University Nijmegen

1993: S. Ghilezan
   *Intersection types in lambda calculus and logic*
   University of Novi Sad
1994: E.G.J.M.H. Nöcker
     *Efficient Functional Programming - Compilation and Programming Techniques*
     Radboud University Nijmegen
1994: J. Kuper
     *Partiality in Logic and Computation - Aspects of Undefinedness*
     University of Twente
1994: E. Poll
     *A Programming Logic Based on Type Theory*
     Eindhoven University of Technology
1995: A.B. Compagnoni
     *Higher-Order Subtyping with Intersection Types*
     Radboud University Nijmegen
1995: E. Barendsen
     *Types and Computations in Lambda Calculi and Graph Rewrite Systems*
     Radboud University Nijmegen
1995: J.-P. van Draanen
     *Models for simply typed lambda-calculi with fixed point combinators and enumerators*
     Radboud University Nijmegen
1996: P. Severi
     *Normalisation in Lambda Calculus and its relation to Type Inference*
     Eindhoven University of Technology
1996: M. Dezani-Ciancaglini
     *Logical Semantics for Concurrent Lambda-Calculus*
     Radboud University Nijmegen
1997: M.H. Sørensen
     *Normalization in Lambda-Calculus and Type Theory*
     University of Copenhagen
1999: M. Stephanova
     *Properties of typing systems*
     Radboud University Nijmegen
1999: M.P.J. Ruys
     *Studies in mechanical verification of mathematical proofs*
     Radboud University Nijmegen
1999: J. Zwanenburg
     *Object-Oriented Concepts and Proof Rules: Formalization in Type Theory and Implementation in Yarrow*
     Eindhoven University of Technology
2000: S. Valentini
     *Meta-mathematical aspects of Martin-Löf’s type theory*
     Radboud University Nijmegen
2001: M. Huisman
     *Reasoning about Java programs in higher order logic using PVS and Isabelle*
     Radboud University Nijmegen
2001: M.D. Oostdijk
     *Generation and presentation of formal mathematical documents*
     Eindhoven University of Technology
2002: V. Capretta  
*Abstraction and Computation. Type Theory, Algebraic Structures, and Recursive Functions*  
Radboud University Nijmegen

2003: B.A.W. Spitters  
*Constructive and intuitionistic integration theory and functional analysis*  
Radboud University Nijmegen

2004: G.I. Jojgov  
*Incomplete Proofs and Terms and Their Use in Interactive Theorem Proving*  
Eindhoven University of Technology

2004: L. Cruz-Filipe  
*Constructive Real Analysis: A Type-Theoretical Formalization and Applications*  
Radboud University Nijmegen

2004: M. Niqui  
*Formalising Exact Arithmetic: Representations, Algorithms and Proofs*  
Radboud University Nijmegen

2006: A.K. Honingh  
*The Origin and Well-Formedness of Tonal Pitch Structures*  
University of Amsterdam

2006: M. Calle  
*Integrative Physiology and Communication in the Amphibian Brain*  
Radboud University Nijmegen
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