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Processes, Terms and Cycles: Steps on the Road to Infinity

Essays Dedicated to Jan Willem Klop
on the Occasion of His 60th Birthday

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Jan Willem Klop

Preface

This Festschrift is dedicated to Jan Willem Klop on the occasion of his 60th birthday on December 19, 2005. Its focus is on the lambda calculus, term rewriting and process algebra, the fields where Jan Willem has made fundamental contributions. Without attempting to give a balanced account of Jan Willem's scientific achievements, we recall three accomplishments from the early years of his career that especially stand out.

The first is his counterexample showing that the extension of the lambda calculus with surjective pairing lacks the Church–Rosser property, or, in modern terminology, is not confluent [7, 9]. This settled a famous open problem, which had challenged several researchers in the lambda calculus community for years.

The second is his pioneering work in term rewriting. In his PhD thesis [9], Jan Willem gave a systematic study of orthogonal rewriting in the general setting of combinatory reduction systems (CRSs), thereby putting the areas of higher-order rewriting and orthogonality firmly on the map. Some of the ideas in the thesis trace back to the famous Blue Preprint [2], from the period that Jan Willem and some other students were graduating in mathematics and logic, under the supervision of Dirk van Dalen and Henk Barendregt.

The third feat is the creation, together with Jan Bergstra [23], of the algebra of communicating processes (ACP).

With his early work, Jan Willem provided inspiration for many years of fruitful research, continuing to this day. For decades he has been a creative and stimulating force in the areas of term rewriting and process algebra. Some of his recent interests are infinitary rewriting, graph rewriting and the geometry of processes.

Jan Willem's scientific world is inhabited by objects like processes, streams, terms, cycles and many other puzzling and intriguing phenomena, and in this world he paves the way, guided by his extraordinary intuition and his great care in visualizing that intuition. To his colleagues, Jan Willem's adventures and the way he talks about them are a never-ending source of inspiration.

This Festschrift contains scientific papers by close friends and colleagues of Jan Willem, written specifically for this book. The papers are different in nature: some report on new research, others have the character of a survey, and again others are mainly expository. Every contribution has been thoroughly refereed at least twice. In many cases the first round of referee reports led to significant revision of the original paper, which was again reviewed. This introduction includes a list of Jan Willem Klop's publications, for reference, and as an overview of the development of his scientific interests and achievements over the years. Although this bibliography is quite extensive, we do not claim it to be complete.

We thank all authors for their contribution to the Festschrift for Jan Willem Klop and we are grateful to the referees for their constructive cooperation. We

also wish to thank Springer for publishing this book in their LNCS Festschrift series, and for the smooth publishing process.

The Festschrift was presented to Jan Willem on his 60th birthday, during a one-day symposium with the same title as this book: *Processes, terms and cycles: steps on the road to infinity*. The symposium not only celebrated Jan Willem's 60th birthday, but also the 25th anniversary of his connection with the CWI in Amsterdam. His first working day as a post-doc at the Mathematical Centre (MC), the predecessor of the CWI, was December 15, 1980.

We invited Zena Ariola (University of Oregon, USA), Arvind (MIT, USA), Henk Barendregt (Radboud University, The Netherlands), Jan Bergstra (University of Amsterdam and Utrecht University, The Netherlands), Nachum Dershowitz (Tel Aviv University, Israel), Mariangiola Dezani (University of Torino, Italy), Roger Hindley (Swansea University, UK), Jean-Jacques Lévy (INRIA, France), and Ronan Sleep (University of East Anglia, UK) to give a talk at the symposium. We are very pleased that they kindly accepted. All speakers are leading researchers in the fields of term rewriting, lambda calculus and process algebra, and their friendship with Jan Willem dates back many years.

The symposium was organized at and together with the CWI. The collaboration with Susanne van Dam and Jaco van de Pol from the CWI has been a pleasure. We wish to thank them, and more generally the CWI, for all their assistance. We also gratefully acknowledge the generous financial support for the symposium from the Vrije Universiteit, CWI, NWO, and the Radboud University.

Also on behalf of Susanne and Jaco, we would like to conclude by stating that it has been an honour and a pleasure to work on the preparation of this book and the symposium. It gave us the opportunity to experience how much Jan Willem is valued by colleagues all over the world. The willingness to contribute and participate and make the best of the book and symposium has been enormous. For this we are thankful of course, but more importantly, the manifestation of this enthusiasm reflects the esteem that Jan Willem has in the scientific community. Congratulations, Jan Willem! We wish you and all of us a fruitful continuation of our cooperation and sharing of interests for many years to come.

October 2005

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Table of Contents

The Spectra of Words <i>Robin Milner</i>	1
On the Undecidability of Coherent Logic <i>Marc Bezem</i>	6
Löb's Logic Meets the μ -Calculus <i>Albert Visser</i>	14
A Characterisation of Weak Bisimulation Congruence <i>Rob J. van Glabbeek</i>	26
Böhm's Theorem, Church's Delta, Numeral Systems, and Ershov Morphisms <i>Richard Statman, Henk Barendregt</i>	40
Explaining Constraint Programming <i>Krzysztof R. Apt</i>	55
Sharing in the Weak Lambda-Calculus <i>Tomasz Blanc, Jean-Jacques Lévy, Luc Maranget</i>	70
Term Rewriting Meets Aspect-Oriented Programming <i>Paul Klint, Tijs van der Storm, Jurgen Vinju</i>	88
Observing Reductions in Nominal Calculi <i>Via</i> a Graphical Encoding of Processes <i>Fabio Gadducci, Ugo Montanari</i>	106
Primitive Rewriting <i>Nachum Dershowitz</i>	127
Infinitary Rewriting: From Syntax to Semantics <i>Richard Kennaway, Paula Severi, Ronan Sleep, Fer-Jan de Vries</i>	148
Reducing Right-Hand Sides for Termination <i>Hans Zantema</i>	173
Reduction Strategies for Left-Linear Term Rewriting Systems <i>Yoshihito Toyama</i>	198

Higher-Order Rewriting: Framework, Confluence and Termination <i>Jean-Pierre Jouannaud</i>	224
Timing the Untimed: Terminating Successfully While Being Conservative <i>J.C.M. Baeten, M.R. Mousavi, M.A. Reniers</i>	251
Confluence of Graph Transformation Revisited <i>Detlef Plump</i>	280
Compositional Reasoning for Probabilistic Finite-State Behaviors <i>Yuxin Deng, Catuscia Palamidessi, Jun Pang</i>	309
Finite Equational Bases in Process Algebra: Results and Open Questions <i>Luca Aceto, Wan Fokkink, Anna Ingólfsdóttir, Bas Luttik</i>	338
Skew and ω -Skew Confluence and Abstract Böhm Semantics <i>Zena M. Ariola, Stefan Blom</i>	368
A Mobility Calculus with Local and Dependent Types <i>Mario Coppo, Federico Cozzi, Mariangiola Dezani-Ciancaglini, Elio Giovannetti, Rosario Pugliese</i>	404
Model Theory for Process Algebra <i>Jan A. Bergstra, C.A. (Kees) Middelburg</i>	445
Expression Reduction Systems and Extensions: An Overview <i>John Glauert, Delia Kesner, Zurab Khasidashvili</i>	496
Axiomatic Rewriting Theory I: A Diagrammatic Standardization Theorem <i>Paul-André Mellès</i>	554
Author Index	639