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Preface

This issue is dedicated to Jan Bergstra on the occasion of his sixtieth birthday

It is difficult to imagine what people in the remote future will think of us. Will they appreciate the scientific literature of the last half century in some way resembling our appreciation of Apollonius of Perga? Or will they see a diffuse decline, a way of life past its term, the end of the age of man, or at least of *intelligent* man, perhaps the beginning of an era of computer-aided trial and error? If the latter, they may discern in Jan Bergstra one representative of the fading age, who perhaps accepted his increasing irrelevance, but went on thinking nonetheless, since that was what he had trained in, and what he was good at. If, however, Jan will be remembered as a mathematician or computer scientist – and one with a story – it will not be as an ordinary one.

Jan Bergstra studied mathematics in Utrecht and wrote a Ph.D. thesis on computability theory for higher type functionals (1976). His work is still referred to in a recent overview [2]. This is the field where he drew his longest solitary furrow. Indeed, one could say that Jan drove a plough into a succession of fields, but he was to make a habit of not steering it alone, nor for long.

It may have been the challenge of doing something practically meaningful that, in 1976, brought him to Leiden University to join the Institute of Applied Mathematics and Computer Science, and get involved in the start-up of a new computer science curriculum. He spent a year adapting degree theory to processes and computational complexity — process algebra might be viewed as a grand flanking movement aimed at understanding this problem.

In 1982, Jan moved to CWI in Amsterdam (then called the Mathematical Centre), after, with John Tucker, having begun his long involvement in the theory of abstract data types (their first publication in this field appeared in 1978). The theory of abstract data types is fundamental to most of the work presented here. Its most direct descendent in this issue is, arguably, the contribution of Tucker and Zucker.

That same year, a question of De Bakker about solutions of process specifications initiated the development of process algebra. At first, Jan cooperated with Jan Willem Klop, and from 1985, increasingly with Jos Baeten and many others. This subject still flourishes, witness the contributions of Aceto et al. on priorities, of Baeten and Luttik on unguardedness, Palamidessi *et al.* on hiding, and of Klop et al. on δ, ϵ and τ. "Fixpoints occur nearly everywhere in computer science", write Höfner and Möller, they certainly occur among the earliest concerns of process algebra. They are also the theme of Esparza et al. Finally, process algebra triggered the development of Structural Operational Semantics, represented in this issue by contributions of Van Glabbeek, of Aceto et al., and of Fahrenberg, Larsen and Thrane.

Jan pioneered the application of term rewriting to abstract data types. This resulted in two elegant booklets, one co-authored by Klop, the other by Klop and Middeldorp. The subject of term rewriting is represented in this issue by contributions of Klop et al., Krebbers and Geuvers, and Hendriks and Endrullis.

With Jan Heering and Paul Klint, Jan constructed an algebraic specification of composite algebraic specifications. Their approach, in the words of a referee of the next century, did not find much of a following. The results were influential nonetheless, and the subject is still quite alive, as may be seen from the contributions to this issue by Diaconescu and Ţuţu, Luettgen and Vogler, Wirsing et al., and Fokkink et al.

Since the late seventies, Jan has written a great number of papers on a large variety of logical subjects (a recent example is [1]). These papers range from program verification to logics for processes and data, and, currently, proposition algebra and short-circuit logic. In this issue, this side of Jan is represented by an update of a 1996 report of Bergstra (himself) and Van de Pol on four-valued logic, and by contributions of Van Dalen, Visser, Jacobs, and Groote et al.

We believe that this collection reflects a considerable part of Jan's research and we hope that it will further the interaction between researchers. Jan Bergstra is – and always has been – an important source of inspiration and stimulation, and we sincerely thank him for that.

Amsterdam, April 2011

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