Review No. 96-05-68-677

R.J.H. VAN GLABBEEK, *Comparative concurrency semantics and refinement actions*. Amsterdam; CWI, 1996. 285 p., prijs *f* 50,– (CWI Tract No. 109). ISBN 90-6196-454-7

In the design and verification of concurrent or parallel systems the semantics of the system description language plays a crucial role. The meaning of such a language is given by an equivalence class of systems which are to be considered to be equivalent on a certain level of abstraction. Action refinement consists of replacing the atomic building blocks in the language by separate subsystems, lowering the level of abstraction, and allowing design steps in which actions are replaced by more complex system descriptions. Comparative concurrency semantics studies and classifies the many semantics that have been proposed in this field.

This CWI Tract is a slightly revised version of the author's doctoral dissertation; it consists of seven papers, of which five have been written together with a coauthor: F. Vaandrager (Ch. 2), P. Weijland (Ch. 3), and U. Goltz (Ch. 4, 5, 6). These papers are preceded by a short introduction (pp. 5–15) of which the second half is a list of 60 results claimed to be novel. The (revised) papers or chapters are:

1. "The linear time – branching time spectrum", pp. 278–297 in: J.C.M. Baeten & J.W. Klop (eds.): *Proc. CONCUR 90*, Berlin, etc.; Springer, 1990.
2. "Modular specification of process algebras", *Theor. Comp. Sci.* **113** (1993) 293–348.
3. "Branching time and abstraction in bisimulation semantics", *J. Assoc. Comp. Mach.* **43** (1996) 555–600.
4. "Refinement of actions in causality based models" pp. 267-–300 in: J.W. de Bakker, W.P. de Roever & G. Rozenberg (eds.): *Proc. REX Workshop on Stepwise Refinement of Distributed Systems: Models, Formalisms, Correctness*, Berlin, etc.; Springer, 1990.
5. "Partial order semantics for refinement of actions – neither necessary nor always sufficient but appropriate when used with care", *Bull. Europ. Assoc. for Theor. Comp. Sci.* (1989) No. 38, 154–163.
6. "Equivalence notions for concurrent systems and refinement of actions", pp. 237–248 in: A. Kreczmar & G. Mirkowska (eds.): *Proc. 14th Symp. Math. Found. of Comp. Sci. (MFCS)*, Lect. Notes in Comp. Sci. 379, Berlin, etc.; Springer, 1989.
7. "The refinement theorem for ST-bisimulation semantics", pp. 27-52 in: M. Broy & C.B. Jones (eds.): *Programming Concepts and Methods*, Amsterdam; North Holland, 1990.

Since this CWI Tract is anything but a monograph (viz. 7 papers with a too concise introduction), the question arises "What is the use of this issue?". Researchers in this field have probably studied the original publications, and other people will prefer a more introductory text.

P.R.J. Asveld