

Bisimulation Invariance: An Approach via Tree Automata

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Abstract: In process theory, at the interface of logic and theoretical computer science, one represents a computational process as a transition system, that is: a collection of states that satisfy certain properties, and are linked by transition relations. For the specification and verification of desired behavior one uses formal logical languages to describe these systems. Since a process can have many distinct representations, one is interested in languages that are expressive enough to express the relevant properties of the process, but not the irrelevant details of its representation. An important notion of equivalence of transition systems is that of a bisimulation: states that are bisimilar (linked by a bisimulation) can be considered to be indistinguishable. As a consequence, properties of states that are not invariant under bisimulations are irrelevant. In this context, it is of interest to identify a bisimulation-invariant fragment of some yardstick logic: If a logic M corresponds to a bisimulation-invariant fragment of a yardstick logic L , then M is strong enough to express all relevant properties of L .

Biography: With a first degree in mathematics (Rijksuniversiteit Groningen, 1987) and a PhD in Logic (Universiteit van Amsterdam, 1992), he thinks of himself as a mathematical logician, with an interest in applications of logic in theoretical computer science. He is now a full professor at the Institute for Logic, Language and Computation at the Universiteit van Amsterdam.

As a logician he is most interested in modal logic and its (mathematical) foundations. In the last ten years most of his attention has been directed towards algebraic and coalgebraic aspects of modal logic. But he also holds an active interest in related areas such as logics of time and space, logic and game theory, automata and process theory.