

# The unknown component problem: theory and applications

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## Abstrak

The problem of the unknown component : theory and applications addresses the issue of designing a component that, combined with a known part of a system, conforms to an overall specification. The authors tackle this problem by solving abstract equations over a language. The most general solutions are studied when both synchronous and parallel composition operators are used. The abstract equations are specialized to languages associated with important classes of automata used for modeling systems. The book is a blend of theory and practice, which includes a description of a software package with applications to sequential synthesis of finite state machines. Specific topologies interconnecting the components, exact and heuristic techniques, and optimization scenarios are studied. Finally the scope is enlarged to domains like testing, supervisory control, game theory and synthesis for special omega languages. The authors present original results of the authors along with an overview of existing ones.