

Synthesis of Underspecified Composite e-Services based on Automated Reasoning

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ABSTRACT

In this paper we study automatic composition synthesis of *e*-Services, based on automated reasoning. We represent the behavior of an *e*-Service in terms of a deterministic transition system (or a finite state machine), in which for each action the role of the *e*-Service, either as initiator or as servant, is highlighted. In this setting we present an algorithm based on satisfiability in a variant of Propositional Dynamic Logic that solves the automatic composition problem. Specifically, given (i) a possibly incomplete specification of the sequences of actions that a client would like to realize, and (ii) a set of available *e*-Services, our technique synthesizes a composite *e*-Service that (i) uses only the available *e*-Services and (ii) interacts with the client “in accordance” to the given specification. We also study the computational complexity of the proposed algorithm.