

# Automatic Composition of *e*-Services that Export their Behavior<sup>★</sup>

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**Abstract.** The main focus of this paper is on automatic *e*-Service composition. We start by developing a framework in which the exported behavior of an *e*-Service is described in terms of its possible executions (execution trees). Then we specialize the framework to the case in which such exported behavior (i.e., the execution tree of the *e*-Service) is represented by a finite state machine. In this specific setting, we analyze the complexity of synthesizing a composition, and develop sound and complete algorithms to check the existence of a composition and to return one such a composition if one exists. To the best of our knowledge, our work is the first attempt to provide an algorithm for the automatic synthesis of *e*-Service composition, that is both proved to be correct, and has an associated computational complexity characterization.