Title: Web services composition for concurrent plan using artificial intelligence planning

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Abstract: Automatic planning of web services composition is a challenging problem both in academia and real-world application. Artificial Intelligence (AI) planning can be applied to automate web services composition by depicting composition problem as AI planning problem. Web services composition would combine multiple services whenever some requirements cannot be fulfilled by a single service. Subsequently, many of the planning algorithms to detect and generate composition plan would focus only on sequence composition thus, neglecting concurrent composition. The aim of this paper is to develop an approach to generate a concurrent plan for web services composition based on semantic web services (OWL-S) and Hierarchical Task Network (HTN) Planning. A Bioinformatics case study for pathway data retrieval is used to validate the effectiveness of proposed approach. The planning algorithm extend Hierarchical Task Network (HTN) algorithm to solve the problem of automatic web service composition in the context of concurrent task planning. Experimental analysis showed that the proposed algorithms are capable of detecting and generating concurrent plan when compared with existing algorithms.