

## Automated biological pathway knowledge retrieval based on semantic web services composition and AI planning

### Abstract

This paper presents the experience gained on semantic web service composition technique applied to the bioinformatics domain. Specifically, the approach presented here consists of knowledge retrieval perspective in biological pathway. Semantic web services, annotated with domain ontology are used to describe services for pathway knowledge retrieval for Kyoto Encyclopedia of Gene and Genomes (KEGG) database. Retrieving knowledge can be seen as high level goals and the tasks involved can be decomposed into subtask to achieve the specified goals. We execute the composition of service by treating composition as planning problem using Hierarchical Task Network (HTN) planning system based on Simple Hierarchical Order Planner 2 (SHOP2). The approach for plan (task) decomposition using SHOP2 is implemented in automated way. We investigate the effectiveness of this approach by applying real world scenario in pathway information retrieval for *Lactococcus Lactis* (*L. lactis*) organism where biologists need to find out the pathway description from the given specific gene of interest.