

Imprecision in service composition and quality of service negotiation

(Assignment 2 for the CS700 seminar)

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1 Background

One of the most popular family of formalisms used to represent knowledge and enable reasoning in the Semantic Web are *Description Logics* (DLs). *Ontologies* capture the knowledge of a domain into a human understandable, machine-readable format and the most popular language used to represent them is *OWL*, of which DLs serve as the conceptual formalism [2].

Although current DLs excel in reasoning using precise logical statements, the crisp precision of their logic fails to handle *imprecise* or *uncertain* information. We argue that if the Semantic Web is to capture real world scenarios and reach its full potential, the ability to model vague knowledge and perform approximate reasoning is key.

2 Research

Fuzzy logic is a powerful and well-established theory to represent concepts with no precise definition and has been used to extend OWL to support reasoning with fuzzy concepts [3]. It is not yet clear, however, how these extensions can be used in common service automation tasks such as discovery, composition, orchestration and quality of service (QoS) guarantee.

Workflow reuse [1] and QoS negotiation are two areas that could benefit from such approach. We plan to investigate common service composition scenarios and study how matchmaking and QoS negotiation under fuzziness compare to the traditional and state of the art techniques in terms of composability, precision and performance.

References

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