The Abstraction Gap Between BDI Agents and Hypermedia and What We Can Do About It

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Abstract

Traditional BDI agents, rooted in logic programming, remain poorly integrated with the hypermedia nature of open Web environments which typically rely on Semantic Web technologies such as RDF and OWL. This paper examines the abstraction gap between these paradigms and surveys existing integration efforts on a conceptual and technical level. Our proposal for a deeper integration relies on a generalized BDI engine to enable the development of BDI agents that can directly reason and operate on hypermedia resources. We reflect on the potential benefits and challenges of this approach and show preliminary results of a proof-of-concept implementation.

Keywords

BDI, Hypermedia, ...

1. Introduction

2. Background

2.1. BDI Agents

Samu: Add BDI agents background, e.g. BDI architecture, BDI logic, etc.

2.2. The Web and Hypermedia

Samu: Add Web and Hypermedia background, e.g. Web architecture, Hypermedia as the engine of application state (HATEOAS), Semantic Web and Ontological Reasoning etc.

2.3. Hypermedia Multi-Agent Systems

Samu: Very briefly introduce the research context of hMAS

3. Integrating BDI Agents and Hypermedia

3.1. Gap Analysis

Samu: What is needed and why there is a gap

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3.2. Integration Requirements

Samu: Ideally, a general list of requirements which guide the analysis of existing approaches and the design of the proposed approach.

Samu: Since this is a short, we can also keep it short and consider a more in-depth analysis for the future...

3.3. Existing Approaches

Samu: Related works, JASDL (Jason+Ontological reasoning), Yggdrasil framework, Hypermedea (Saint-Etienne Cartago Artifacts for Hypermedia), others....

4. Levelling the Abstraction Gap with a Generalized BDI Engine

Samu: Preliminary description of the approach + possible showcase of WIP prootype?

5. Discussion

Samu: Challenges and opportunities of the approach, e.g. ontological reasoning and inference, Belief consistency, "goal" definition and management,

6. Conclusion

Acknowledgments

Samu: Add Acks

Declaration on Generative AI

Samu: TODO

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