

Concept Visualization for Semantic Networks and Ontologies of Learning Agents

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1 Introduction - Problem Statement and Purpose

The purpose of this project is to research, create, and program a concept visualization tool to easily browse small to large scale semantic networks and ontologies of an artificial intelligence. This is a topic that relates closely to graph theory and graph layout algorithms but adds in another factor by taking into account the relationships between different nodes and elements of a learning agent.

2 Background

The Disciple Learning Agent is an artificial intelligence that can be adapted for many purposes such as military operations, teaching, and traveling. It is currently being developed at the George Mason University Learning Agents Center. I worked with the department over the summer and will continue to work with them remotely at school.

3 Procedure and Methodology

The Disciple Learning Agent is currently written in JAVA and called JDisciple. The entire project is done in separate parts according to different functions and methods. Eclipse is used to provide a basic organized structure

for the entire project. I plan to write my code in many different iterations starting with the simplest of cases and gradually moving to more advanced cases. The first version of my program will involve manipulation of small explanation element lists in a Disciple agent and represent the elements in an understandable, graphical way. This will involve an implementation of a basic element picking algorithm such as a Greedy, and a basic graph layout algorithm to place and make space for elements on the screen. Then, I will improve upon the tool every iteration by modifying the heuristics to make it more efficient, faster, and usable for larger ontologies.

4 Testing and Analysis

Testing will be done by both me and the other developers of this project at GMU. There are multiple sets of existing data that I can use to provide a general feedback on if and how well my project works.

5 Expected Results and Value to Others

My project is a subproject of the JDisciple Learning Agent. It will serve as the basis of all graphical representation in the agent's ontology. I expect that future programmers may improve or modify my tool after I leave the development team at the GMU Learning Agents Center. It eventually will be integrated and distributed with all versions of JDisciple.