

**MASTER'S PROJECT (FALL 2015)****TOPIC:** *Implementation of a Semantic Search Engine Using Graph Database***PRESENTOR:** Roni Hyam**ADVISOR:** Dr. Haiping Xu**DATE & TIME:** Friday, December 4, 2015, 4:00 PM**LOCATION:** LARTS 117**COMMITTEE MEMBERS:** Dr. Firas Khatib and Dr. Jan Bergandy**ABSTRACT**

As semantic search engines are supported by knowledge bases, they typically generate more accurate and more relevant search results. There are many different ways to implement the knowledge bases, such as ontology, knowledge graph and graph database. Among them, a graph database can not only easily capture semantic information of a given domain, but also directly supports semantic queries with nodes, edges and properties to represent and store data. In a knowledge graph, each node can hold a number of attributes as key-value pairs, and can be tagged with labels representing its different roles in the domain. A relationship between two nodes has a direction, a type, a start node, and an end node, and provides directed and semantically relevant connections between the nodes. In this project, we use a graph database to implement a semantic search engine. Comparing to traditional databases, a graph database is more suitable for handling complex, voluminous and unstructured data, and it does not require complex joins to retrieve connected or related data as it is very easy to retrieve its adjacent node or relationship details without joins or indexes. In addition, our approach allows users to easily add additional knowledge into an existing knowledge graph and enhance the graph database for better search results. To demonstrate the feasibility of the proposed approach, we implement a prototype search engine for identifying a tree based on its properties. The tree nodes are connected in two ways: as indirect connections, trees are connected through shared (common) attributes; while as direct connections, trees are connected based on their genus, family and order. The graphical user interface (GUI) of the prototype shows that the semantic search engine approach is feasible and can provide more relevant search results than traditional search engines.