**Abstract**

Nowadays the data is stored in multiple formats. One of this is the graph database, where the entities are represented by the nodes and the relations between the nodes by the edges. Adapting to the data structure, a variety of graph querying languages have been created that are able to describe complex structures.

The testing of graph query engines is a serious challenge, especially in automated solutions. The biggest challenge in this case is the automatic and systematic production of varied models and queries that serve as test inputs. In addition, performance metrics for graph databases would be greatly aided by the automatically generated set of models.

The purpose of my dissertation is to find solutions to these problems. During my research, I will show that an auto-generated divert set of models, whose models can be interpreted as a query in a graph query engine (e.g. VIATRA or Neo4j) how it is possible to test that graph query engine.

In the course of my work, I produce models with the help of advanced logical solvers, the diversity of which is ensured by neighborhood shapes. The results of the logical solvers can be interpreted as queries and the content of the databases, the results of which can be compared to different implementations. I present my solution in a case study.

This method makes it possible to develop more reliable graph query engines at a lower cost. And such a set of models translated to multiple graph querying languages can be used in those graph query engines for performance measurements by measuring response times.