Bachelor/Master Thesis

Computing Variable Length Paths on Graph Databases

Investigate the computation of variable length paths on Neo4j and implement algorithm(s) to compute variable length paths as resource-constrained shortest paths

Tasks
- Investigate the computation of variable length path queries on Neo4j
- Implement algorithms to compute variable length path as resource-constrained shortest paths in Neo4j
- Evaluate the implemented algorithms against the current ones used by Neo4j

Requirements
- Basic knowledge of graph theory and algorithms
- Experience in JAVA programming

Preferable
- Experience with Neo4j
- Course on Graph Data Management/Analysis (INF-21320 or equiv.)

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```sql
SELECT MIN(fwd.dist+bwd.dist)
FROM fwd,bwd
WHERE fwd.id = 'A' AND bwd.id = 'E' AND fwd.hub = bwd.hub
```
Bachelor/Master Thesis

Graph Query Processing on Relational Databases

Implement indexing methods to process distance and shortest path based queries on relational DBMS

Tasks
- Investigate existing approaches for the evaluation of distance and shortest path queries on relational DBMS
- Implement algorithms to evaluate distance-based queries on relational DBMS
- Evaluate the implemented solution against real-world relational and/or graph DBMS

Requirements
- Knowledge of Relational Databases and SQL
- Knowledge of JAVA programming (or similar)

Preferable
- Basic knowledge of graph theory and algorithms
- Course on Graph Data Management/Analysis (INF-21320 or equiv.)

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Master Thesis

Online Approximation of Graph Analytics

Identify graph analysis measures that can be approximated only using the results of previously executed queries

Tasks
- Analyze query logs on graph databases
- Identify graph analysis measures that can be approximated from the queries
- Investigate the influence that the obtained measures can have on query processing

Requirements
- Knowledge of data analysis methodologies
- Knowledge of JAVA or a similar programming language
- Basic knowledge of graph theory and algorithms

Preferable
- Course on Graph Data Management/Analysis (INF-21320 or equiv.)

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