# Bachelor's Thesis Topic

## Evaluating the Vertical and Horizontal Read and Write Scalability of MobilityDB

### Summary

Spatiotemporal databases, which are databases that focus on storing spatiotemporal data (data that has both a location and a timestamp), are becoming more popular in the recent years due to the increase of such data production by IoT devices. Such data may be produced by smartphones, cars, weather stations, and others. A subset of such data is moving object data, which focuses on the movement of singular data points both in location and in time.

MobilityDB is a database specifically developed to handle such data. Built on top of the already spatial extension PostGIS, It provides several additional features to increase the querying and storage capabilities with regards to spatiotemporal aspects. Previous research has shown the querying possibilities that are provided by these additional features.

While query run times of specific queries have been evaluated and distributed read/write ingestion for Citus alone, the vertical and horizontal scalability of the platform has only been touched upon, but not fully researched. MobilityDB is distributable to multiple nodes by using it in coordination with Citus, another extension for PostgreSQL. The task of this thesis would be to evaluate both the vertical and horizontal scalability of the platform with realistic spatiotemporal data, while also regarding the currently available querying options. The student needs to deploy both single-node and the distributed version of MobilityDB and then benchmark the system under test while collecting various metrics, such as request latency, write throughput, and others.

Relevant papers:

https://docs.mobilitydb.com/pub/MobilityDB_LATAM2020.pdf

https://dipot.ulb.ac.be/dspace/bitstream/2013/312938/3/MobilityDBDemo_MDM2020.pdf

https://dl.acm.org/doi/abs/10.1145/3406534

https://dl.acm.org/doi/abs/10.1145/3448016.3457551

https://link.springer.com/article/10.1007/s00778-009-0142-5