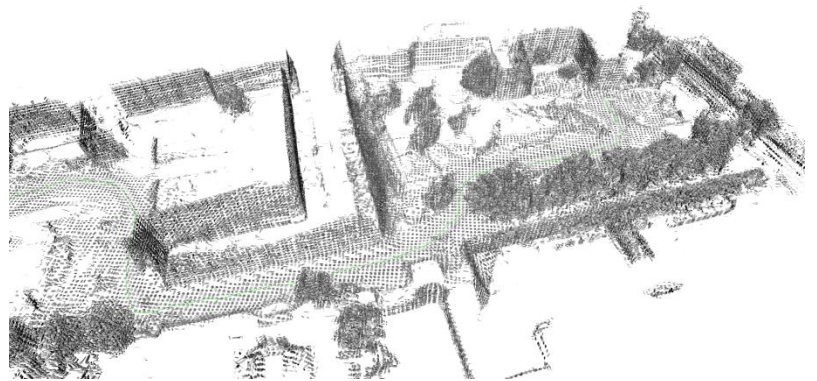




# Efficient Rendering of Large Scale 3D NDT Maps

Localization is still an interesting topic in Mobile Outdoor Robotics. However, this task requires an accurate and efficient representation of large scale and unstructured environments.



Currently, we are working on a new map implementation based on both Occupancy Gridmaps and Normal Distributions Transforms (NDT), which discretizes 3D sensor readings into grid cells and approximates them as multivariate Gaussians.

Visual examination tools are beneficial to improve map quality and subsequently also map accuracy. The problem is, that rendering e.g. large amounts of ellipsoids is computationally expensive and is not realized efficiently yet. The goal of this thesis is to develop an efficient and responsive, real-time-capable visualization tool to improve our research on this kind of maps. This tool should be able to provide attribute informations about the individual distributions, different views in every available coordinate system and free viewpoint navigation, similar to e.g. RVIZ.

The implementation of this software should focus on easy extensibility for further research purposes and should be suitable for online use on our mobile robots, which includes incremental map updates and an interface to ROS. For efficiency, OpenGL, C++ and optionally Qt are most likely to be used.

## Kontakt

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