



Tree Detection with different Sparse and Dense 3D Sensors

For localization in outdoor environments, it would be interesting to detect trees and use them as landmarks.



In this work, a robust and fast tree detection system shall be implemented, based on the 3D sensors mounted on our Summit XL outdoor robots. Therefore, an existing recently published approach based on dense 3D sensors needs to be implemented as a baseline and may be extended, if needed. The tree detection algorithm is based on extracting a ground plane and detecting tree “shadows” in it, and may be accelerated using methods developed in this department. The applicability of this approach to the different 3D sensors is to be evaluated.

This work includes recording a multi-sensor dataset in the surrounding area of the Sand building, containing data of the available 3D sensors: a Velodyne VLP-16 laser scanner, a stereo system based on the Nerian SceneScan Pro, and an Intel RealSense D435 RGB-D camera, if possible. For evaluation, trees need to be labelled, e.g. in a ground truth map.

The approach shall be implemented in C++ under Linux and using ROS. Prior knowledge, e.g. by visiting the Mobile Robots practical course, is beneficial. The thesis may be written either in English or in German.

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