Meshes are the foundation for interaction and texturing of 3D objects and 3D scenes. Reconstruction algorithms often generate point-clouds (sparse, semi-sparse, dense), which contain a lot of data and are not optimal for texturing or collision detection (e.g. physics engine). Having a robust method to generate semantically correct meshes from point-clouds enables a lot of applications e.g. object placing on planar surfaces, games within the reconstructed scene.

The aim of this project is to analyses the existing point-cloud and to generate a mesh for further usage. Approaches like plain-fitting into sub-areas of the point-cloud have to be considered. It is also important to detect and remove outliers for the mesh-generation. Methods described in existing literature can be used as foundation and further improved. The target inputs are the outcomes of SLAM algorithms which can provide additional information like camera poses and corresponding rgb-images. One idea is to perform image segmentation and to propagate the information to the point-cloud, which will then guide the meshing step.

The aim of this project, is to generate an algorithm which will take the point-cloud with the corresponding images and poses as input and generate a 3D mesh. This can happen either on a snapshot of the mesh (offline) while the slam system is operating or in a streaming fashion on the 3D point output of a operating SLAM system (online).

C++, Matlab, Octave