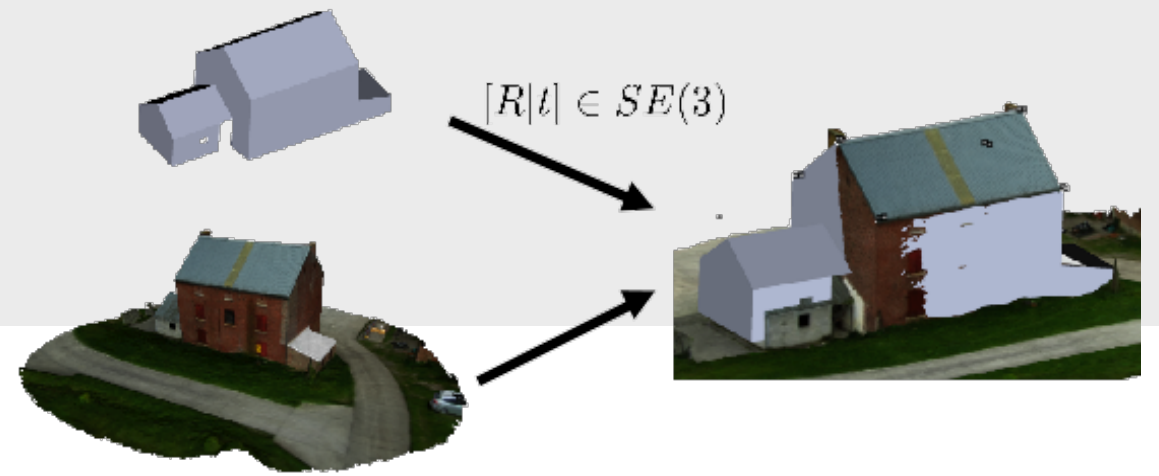


Global Model Alignment



Model vs. Scan alignment

Goal: Robust 3D Registration between scanned models and CAD models.

Description:

For the purpose of construction progress tracking we want to register 3D model scans with their corresponding CAD model for a comparison of the planned vs. the actual build progress.

To this end, we want to be able to align: 1) scanned model vs. scanned model, 2) scanned model vs. CAD model, 3) CAD model vs. CAD model. For robustness we want to apply global alignment methods [1] and study which features [2] give the best performance.

Goals:

1. Obtain a point cloud (PC) from a CAD model (by sampling) and apply PC vs. PC registration [1].
2. Transform to volumetric representation. Investigate which features can be applied.
3. Transform to mesh. Investigate which features can be applied.

[1] Zhou QY., Park J., Koltun V. (2016) Fast Global Registration. ECCV 2016.

[2] Radu B. Rusu et al. 3D is here: Point Cloud Library (PCL: pointclouds.org). ICRA 2011.

Requirements / Tools:

Required: Matlab / C++

Recommended: PCL library (pointclouds.org)

Supervisor:

Pablo Speciale <pablo@inf.ethz.ch>

Martin Oswald <martin.oswald@inf.ethz.ch>