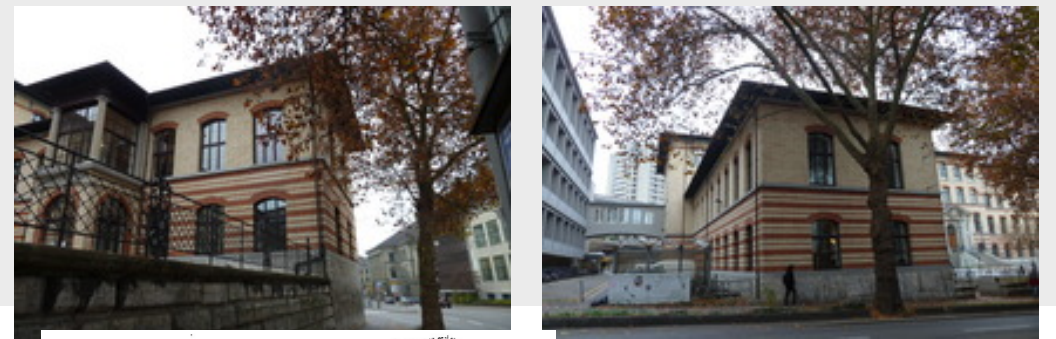


Detection of repeated structures in SfM



Goal: Detect large repeated structures in urban sparse point clouds obtained through SfM.

Description:

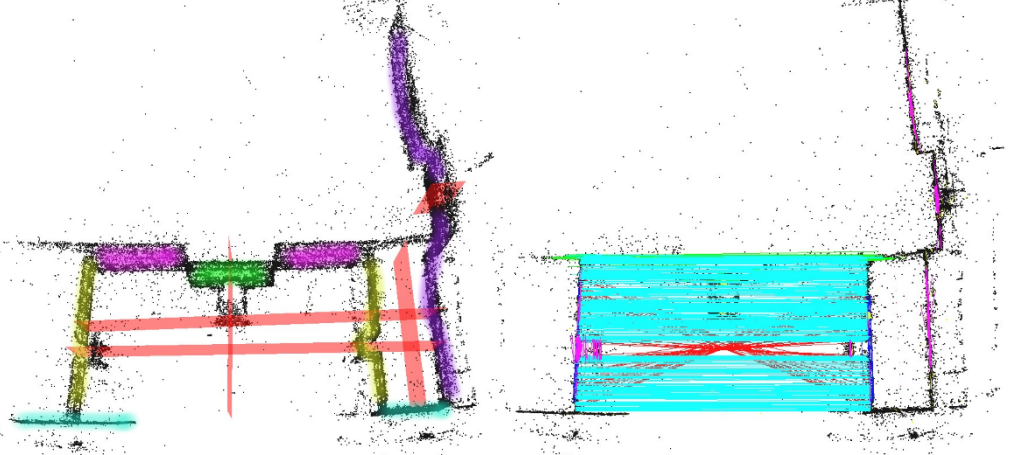
Sparse point clouds of urban scenes obtained through Structure-from-Motion are used in a large number of applications, such as virtual tourism, autonomous navigation, urban scene modelling, etc. However, many of these applications require the localization of a new image against this previously computed point cloud. This task becomes very hard in the presence of repetitive structures in the building.

In this project, we aim to use the original images and the sparse point cloud in order to detect all of these repetitive structures and identify them on the point cloud, such that subsequent applications can use this information to improve their performance. We will start by using the SIFT matching-based algorithm described in [1] to detect matching 3D points, and then use guided matching and plane extraction in order to find the whole areas of support of each found symmetry/repetition.

[1] A. Cohen, C. Zach, S. Sinha, M. Pollefeys, “Discovering and Exploiting 3D Symmetries in Structure from Motion”, CVPR 2012

Requirements / Tools:

Required: C++, OpenCV



Supervisor:

Andrea Cohen

<http://people.inf.ethz.ch/acohen/>