Fixing Structure-from-Motion (SfM) Reconstructions


Broken SfM Model

Goal: Automatically detect errors in SfM reconstructions by detecting free-space violations

Description:

Structure-from-Motion (SfM) algorithms such as [1] reconstruct the 3D structure of a scene from images. Due to ambiguities, caused e.g. by repetitive structures, SfM algorithms might connect unrelated parts, resulting in duplicated or collapsed structures (see images).

The goal of this project is to use free-space constraints [2] and semantic cues [3] to detect these errors and, if possible, correct them.

[1] Schönberger & Frahm, “Structure-from-Motion Revisited”, CVPR 2016

[2] Cohen et al., “Indoor-Outdoor 3D Reconstruction Alignment“, ECCV 2016

[3] Cohen et al., “Merging the Unmatchable: Stitching Visually Disconnected SfM Models”, ICCV 2015

Requirements / Tools:

Required: C++

Supervisor:

Torsten Sattler

torsten.sattler@inf.ethz.ch

CNB G104