Mathematisch-Naturwissenschaftliche Fakultät
Fachbereich Informatik
Kognitive Systeme (Prof. A. Zell)

Masterarbeit

Variational fusion of dense stereo depth maps for 3D reconstruction

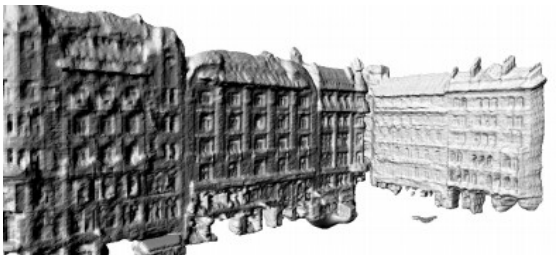
Depth maps computed with most local stereo matching algorithms contain substantial amounts of outliers and noise. But, local stereo algorithms are very fast and suitable for real-time tasks. This made them the most widely used stereo matching algorithms. In order to accurately reconstruct a 3D model by fusing the 3D maps there is a need for methods that are robust against outliers and noise. Variational methods such as the Total Variation (TV) have recently been successfully applied to resolve the above mentioned problem. A well explained TV method for reconstructing 3D models from depth maps has been recently proposed by Christopher Zach (TU Graz).

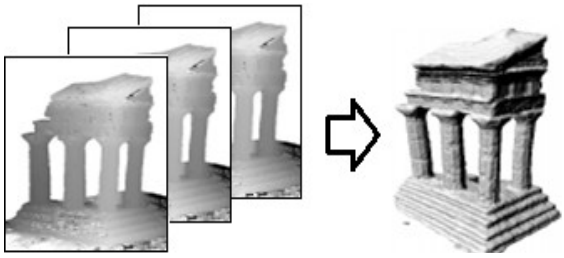
The goal of this master thesis is to develop and implement a variational method which can generate accurate 3D models by fusing stereo depth maps. The method should be robust against outliers. The method can be limited to static environments. Optionally, the proposed method can be evaluated using the Middlebury multi-view stereo benchmark:

http://vision.middlebury.edu/mview/

The task requires:

- Knowledge in 3D computer Vision
- C++/C programming under Linux
- Interest in applied mathematics





Depth maps 3D reconstruction

Photos credit:http://www.icg.tugraz.at/Members/zach/my_publications/iccv2007.pdf

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