

Visual Hull Computation

Hand out date: 31st Oct. 2007

Due date: 9 am, 7th Oct. 2007

Discussion permitted, but individual assignment.pdf report is required.

Submission via email with subject "Assignment 5" to li.guan@inf.ethz.ch

Objective

This assignment is about visual hull computation. You shall implement naive silhouette extraction and complete the provided MATLAB code "VHalgorithm.m". The description, images and the in-class slides for assignment 5 can be found in the assignment folder:

<http://people.inf.ethz.ch/~guan/3DPhotography/assignment5/> .

Assignment Requirements

1. Download the images and the corresponding projection matrices from the "smallDavid" subfolder. You can view the projection matrix files - ".PA" files with any text editor.
2. Extract silhouettes from the images with a simple thresholding method on image intensities.
3. Complete the provided MATLAB code "VHalgorithm.m". The visual hull computation part is to be filled in by you. The projection matrices loading and visualization are already provided.
4. Download the images from "pillar.zip". This is more challenging than "smallDavid". This file is about 300MB.
5. You need to build up RGB background models for each camera view using 50 frames of background images that are provided, and then using the completed "VHalgorithm.m" to visualize the visual hull result. Notice here that the projection matrices are a little bit different from the previous files. Check it before you run for this reconstruction.
6. Write up about the implementation and result. Analyze qualitatively and quantitatively the reconstruction quality with respect to difference camera numbers in use. Hand in a *pdf* file about the implementation and the discussion. Include your source code for the color model construction and the complete VHalgorithm implementation. Make it a *zip* file and send me the **link** to get it in email.
7. Extra points will be given for surface refinement, other background subtraction methods, etc.