

Computational Photography Lab Course 2009

Assignment 1 (April 21, 2009): Simple Scene Geometry Application

Create a Matlab GUI, in which two different camera setups can be compared.

A ZIP file including the code for a running demo is to be submitted by e-mail to **Darko** by **23:59, April 28, 2009**.

If you should have further questions or need help getting started with Matlab, please do contact one of the TAs!

Requirements (compare also the figure of the example GUI):

- Camera input parameters:
 - focal length
 - sensor size
 - distance of center of projection (CoP) to an imaginary object
- From these values, following is to be computed:
 - Field of view angle (FoV)
 - Crop factor (in relation to the 35mm “full format” size (36x24mm); Compare diagonals)
- Geometry should be compared in two views:
 1. Orthogonal view of the scene from above (left in example GUI)
 2. Comparison of captured image sizes. Make here the assumption that the distance is the same for both setups, that is, that the CoPs coincide, i.e. ignore the distance settings.

Resources:

- Homepages of the Computational Photography lectures at CMU and MIT:
 - CP @ CMU: http://graphics.cs.cmu.edu/courses/15-463/2008_fall/463.html
 - CP @ MIT: <http://stellar.mit.edu/S/course/6/sp07/6.088/index.html>
- Matlab introduction:
 - Matlab help
 - General Matlab intro tutorial (tons of info on the web):
 - http://campar.in.tum.de/twiki/pub/Chair/TeachingWs07CV/MATLAB_Workshop.pdf
 - Matlab GUI:
 - http://www.mathworks.com/support/2008b/matlab/7.7/demos/CreatingGUIwithGUIDE_viewlet_swf.html
 - Hint for using multiple figures in a GUI: use the command axes to select, into which figure to draw. For example, for figures fig1 and fig2 which, you can

make them active by calling `axes(handles.fig1)` or `axes(handles.fig2)` respectively

