CSSE 461 – Computer Vision
Rose-Hulman Institute of Technology
Computer Science and Software Engineering Department

Problem Set 3

This problem set is due 01 April 2016.

This document contains hyperlinks and is best viewed as html.

Mosaics

2. Build a mosaic using using images from the Root Quadrangle sequence, the Wilson north mural sequence, or the Wilson south mural sequence. The mosaic should contain at least 4 tiles. Overviews of the Root Quadrangle sequence, the Wilson north mural sequence, and the Wilson south mural sequence are available.

   A brief tutorial on a few matlab instruction which might be help in creating mosaics can be found here.

Stereo Pairs

3. Rectify the random dot stereogram (left and right). For the left image

$$
K = \begin{bmatrix} 1024 & 0 & 127.5 \\ 0 & 1024 & 127.5 \\ 0 & 0 & 1 \end{bmatrix} \qquad R = \begin{bmatrix} \frac{2}{\sqrt{5}} & 0 & \frac{1}{\sqrt{5}} \\ 0 & 1 & 0 \\ \frac{1}{\sqrt{5}} & 0 & -\frac{2}{\sqrt{5}} \end{bmatrix} \qquad \tilde{C} = \begin{bmatrix} -50 \\ 0 \\ 100 \end{bmatrix}
$$

   and for the right image

$$
K' = \begin{bmatrix} 1024 & 0 & 127.5 \\ 0 & 1024 & 127.5 \\ 0 & 0 & 1 \end{bmatrix} \qquad R' = \begin{bmatrix} \frac{2}{\sqrt{5}} & 0 & -\frac{1}{\sqrt{5}} \\ 0 & 1 & 0 \\ -\frac{1}{\sqrt{5}} & 0 & -\frac{2}{\sqrt{5}} \end{bmatrix} \qquad \tilde{C}' = \begin{bmatrix} 50 \\ 0 \\ 100 \end{bmatrix}.
$$

   Be sure to explain how you performed the rectification and include R_{rect} and H_{rect}.

Turning it in

Turnin your corresponding points (as a .mat file), transformations, transformed and mosaiced images, any code you wrote to recover the transformations and/or transformed and mosaiced

images, and a discussion of your solutions in electronic form using svn. Your materials should be placed in the `ProblemSet3` directory of your class repository (`http://svn.csse.rose-hulman.edu/repos/1516c-csse461-<your username>`).