Computer Vision, fall 2019

Exercise 5, 9.10.2019

Ex 5.1 Panography

Create the kind of panograph discussed in Szeliski's book's Section 6.1.2 and commonly found on the Web. The equations given in the task are from Szeliski's book http://szeliski.org/Book/drafts/SzeliskiBook_20100903_draft.pdf.

1. Take a series of interesting overlapping photos.

2. Use feature detector, descriptor, and matcher to match features among the images.

3. Turn each connected component of matching features into a track, i.e., assign a unique index i to each track, discarding any tracks that are inconsistent (contain two different features in the same image).

4. Compute a global translation for each image using Equation (6.12).

5. Compute the size of the resulting composite canvas and resample each image into its final position on the canvas. (Keeping track of bounding boxes will make this more efficient.)

6. Average all of the images, or choose some kind of ordering and implement translucent over compositing (3.8).

Ex 5.2 Optical flow

Compute the pixel velocities (u,v) using the Lucas-Kanade algorithm discussed at the lectures and in Szeliski's book Chapter 8 for the two images frame10.png and frame11.png. The images are taken from the site http://vision.middlebury.edu/flow/ containing a great optical flow datasets for research purposes.