

CSCI 5561: Computer Vision

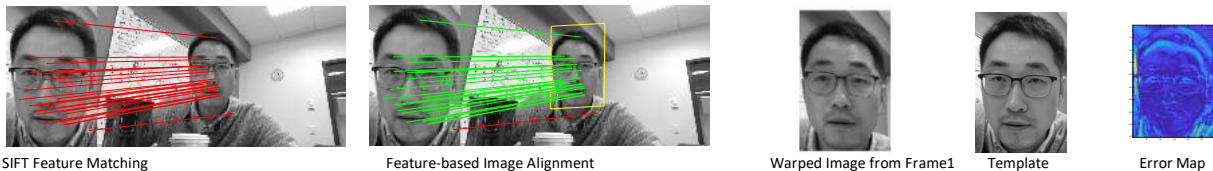
Prof. Hyun Soo Park

HW2 Report | Name: Abinash Sinha | x500: sinha160

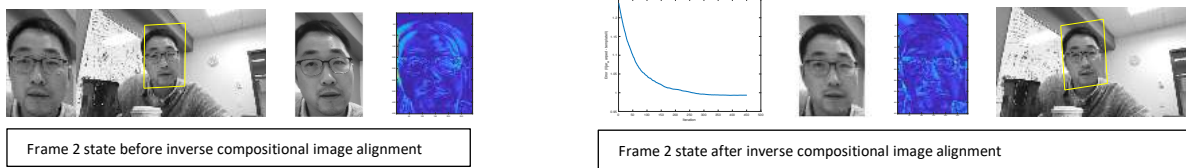
1. SIFT feature matching is done by searching for corresponding key points in target image using 2-nn search and the ratio test is conducted by having a ratio of 0.7
2. RANSAC algorithm is used to find the boundary with most inliers. The threshold value MUST be an integer because we are dealing with pixels so it has meaning in terms of integer. In each iteration, it is checked whether new number of inliers is more than maximum number of inliers until now. If yes, then update this max_num_inliers value and also re-calculate number of iterations (this is done keeping in mind to achieve 95% probability finally).
3. The corresponding boundary in the target image is drawn by transforming the corners of template image using affine transformation matrix that is learnt.
4. image is warped by transforming template image. After that, those transformed coordinates are used to search corresponding patch in target image which is basically our warped image.
5. Error map between template image and warped image is basically absolute difference between their intensities.
6. We can see that we inverse compositional image alignment algorithm converges as iterations proceed. I have kept a threshold of 0.005. For multi-frame image tracking:
 - a. Assuming constant brightness in all frames (eg. RGB values must be similar across all frames of the image) - $I(x, y, t) = I(x', y', t')$ where $t' > t$ (time)
 - b. Assuming motion between frames is small so that first order approximation holds for next frame given current frame

Note: Please zoom in to observe the images clearly. The raw images are taken from HW2 pdf document by using an online image extractor. Also, the frames should have same sizes.

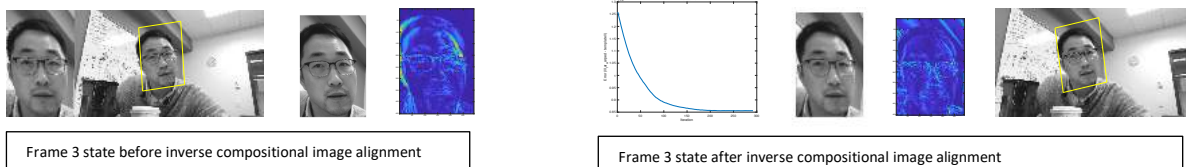
VISUALIZATIONS



Frame 2



Frame 3



Frame 4

