

## CSE252B – Computer Vision II – Assignment #4

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<http://www-cse.ucsd.edu/classes/sp05/cse252b>

Due Date: Tue. May 24, 2005.

1. Use normalized cross correlation (`normxcorr2.m`) to find correspondences in `desk1.gif` for five selected points in `desk0.gif`. Do some experimenting to choose an appropriate window size. For each point in the first image, indicate the top three best matches in the second image using different pointmarkers and/or the digits {1, 2, 3}.
2. MaSKS Exercise 4.6 (Eigenvalues of the sum of outer products), p. 98.
3. Modify the derivation of the Förstner corner detector to solve for the least-squares subpixel centers of circular features.
4. Interest point detection.
  - (a) Implement MaSKS Algorithm 4.2 (Corner detector), p. 91.
  - (b) Demonstrate your code on `house.bmp`. Include in your writeup a zoomed-in figure detailing the results in a selected interesting neighborhood.
5. RANSAC for Homography Estimation.
  - (a) Devise and implement a RANSAC-based method for automatically estimating the homography  $H$  between two images.
  - (b) Apply your algorithm to the image pair `desk{0,1}.gif`, which was acquired by a camera rotating about its optical center.
  - (c) Display the initial set of putative correspondences, the inliers, and the outliers consistent with the estimated  $H$ .
  - (d) Use the estimated  $H$  to create a mosaic out of the two images.