

Name: _____

CSE 634

Computer Vision for HCI

AU'11

Homework Assignment #4

Due: Tuesday 10/25

- 1) Using the images (aerobic2.[001-022].bmp) provided on the class WWW site, compute simple motion detection between consecutive frames using (abs) image differencing. Remove any tiny regions (use bwareaopen, median filtering, etc.). Experiment with different thresholds. Pick a pair of images and test Weber's Law with different thresholds (for k) – use the algorithm listed in the notes that employs Gaussian smoothing. [3 pts]
- 2) Compute an MEI and MHI on the image sequence (using the best motion differencing approach from step 1 above), simulating the timestamp with the frame number of each image. Choose a duration that includes all images of the sequence into the final template. Use imagesc to show your results. Compute the 7 similitude moments for the MEI and the MHI and compare (please normalize the MEI and MHI to be between 0-1 before computing the moments). [4 pts]
- 3) Create a 100x100 binary image with a black (0) background and a white (255) 21x21 box centered in the image. Create a new "box" image, but shift the box 1-pixel to the right and 1-pixel down. Compute the normal flow between the images. Use Matlab's quiver function to draw the vector motions. (Make sure your axes are consistent for the plots – examine 'axis(ij)'.) Make sure all masks are "correct" with proper scaling/normalization. Is the result what you expected? [5 pts]
- 4) Turn in all code, printouts of images, and discussion of results. Make a HW4.m script to do the above tasks and call needed functions. Email your code to the class grader. [2 pts]