Problem set 2

Email your solutions to me (pjkohler@yorku.ca) in a single .zip or .tar file named with your last name in lowercase, e.g., kohler.zip. Be sure to include sufficient help text and comments in your code.

1. Use MATLAB and the Psychophysics Toolbox to program a visuomotor experiment that measures a person's ability to track a target on a computer screen using the mouse.

I have provided a function randpos.m that generates a random trajectory for the target. See the help text and the script randdemo.m for information on how to use this function.

The experiment has ten trials, each of which takes ten seconds. On each trial, a small circle moves around the screen on the random trajectory given by randpos.m. The subject moves a small plus symbol around the screen using the mouse. (Hide the default mouse cursor and draw this plus symbol yourself using the Psychophysics Toolbox.) The subject's goal is to keep the plus symbol centered on the moving circle.

Save the results in a .mat file. For each trial, record the complete trajectory of the target and the complete trajectory of the mouse cursor. Also record the distance (in pixels) between the target and the cursor as a function of time.

Write an analysis routine that plots the distance between the target and the cursor over the duration of the trial, averaged over all ten trials. The plot might look something like the one on the following page.