1. Pointing and Fitts’s Law [20 Points]

(a) [12 Points]

The window shown to the left is the movable tool palette for selecting drawing tools in Adobe Photoshop. The user selects a tool by clicking on one of the icons in the palette. Assume the user is running Photoshop on a standard desktop machine using a mouse.

The Fitts’s formula for Movement Time (MT), given in Hinckley’s paper, is

\[ MT = a + b \log_2 (A/W + 1) \]

For each of the variables (a, b, A, and W), describe what it measures, and suggest how to redesign tool selection in Photoshop to decrease MT based on a change to that variable.
(b) [8 Points]

The MacOS has a single menu bar at the top of the screen, which changes contents to suit whatever application is currently active. Windows puts a menu bar near the top of each active window, below the windows’ title bars.

i. From a cognitive perspective, what principles argue for doing it the Windows way?

ii. From the perspective of Fitts’s Law, what is the advantage of the Macintosh way?
2. User Testing [16 Points]

To make use of your newly acquired expertise in HCI, you volunteered as a peer reviewer for an academic conference, and you were invited to review a paper submission entitled “Improving Data Entry with the GOOBER System.” Read the following excerpt from the paper’s “Evaluation” section.

To evaluate my system, I invited undergraduate CS students enrolled in my course to participate in an experiment for extra credit. I explained to them that they would be comparing an old system for data entry (Microsoft Excel) to a new data entry system that I had been building for three years. Five participants were asked to enter one page of data, first using Microsoft Excel, and then using my GOOBER system. I then asked participants to rate both systems on an integer scale from 1 (bad) to 4 (phenomenally awesome). Excel received an average rating of 3, while GOOBER received an average rating of 3.5. Several subjects commented that GOOBER was “easy to use” and “intuitive.”

Point out four problems with the experimental methodology, and suggest a way to fix each problem. [4 points each]