

HCI HW3 – Evaluating Fitts' Law

Submitted by Gautam Krishnan on 4/6/2017

Literature Review:

Fitts' law is a predictive model of human movement primarily used in human-computer interaction and ergonomics. This scientific law predicts that the time required to rapidly move to a target area is a function of the ratio between the distance to the target and the width of the target. Fitts' law is used to model the act of pointing, either by physically touching an object with a hand or finger, or virtually, by pointing to an object on a computer monitor using a pointing device. [[Wikipedia](#)]

The formulation of Fitts' index of difficulty most frequently used in the Human-Computer Interaction community is called the **Shannon formulation**:

$$ID = \log_2 (D/w + 1)$$

Where ID is the index of difficulty, D is the distance from the starting point to the center of the target, W is the width of the target measured along the axis of motion and MT is the average time to complete the movement.

Parameters and Calculation:

Experimental setup: A modified version of [Simon Wallner's experiment](#).

Input modality: Apple Magic Mouse

Experiments: 6

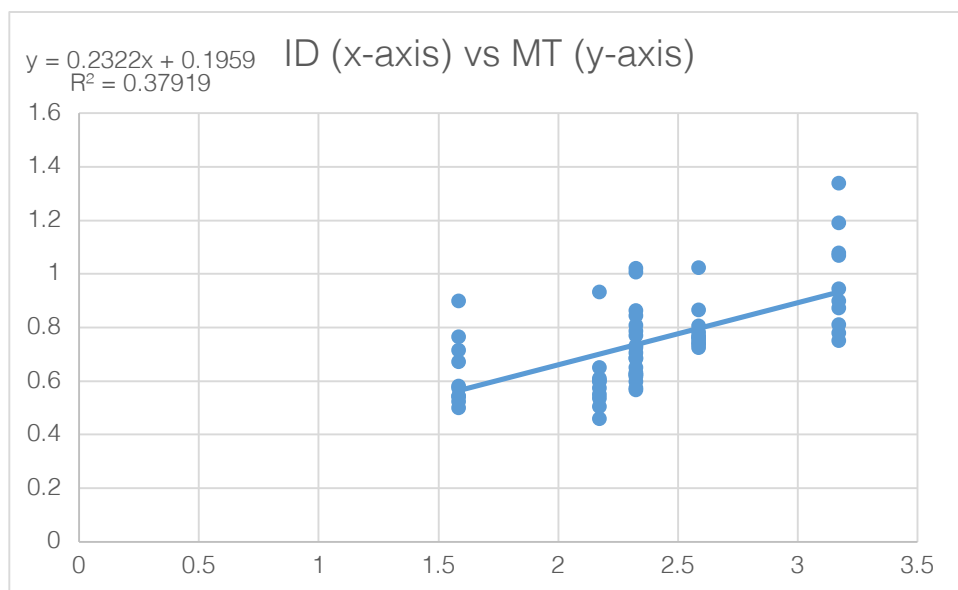
Clicks/Experiment: 9

Input values (D,W): (200,50), (400,50), (250,50), (200,100), (250, 100), (400, 100).

Calculated IDs: 2.323, 3.171, 2.585, 1.585, 2.171, 2.323

Calculation of Regression Coefficients:

The time taken for the movement was recorded for each ID. The scatter plot was drawn using raw data from 6 experiments.



The linear regression equation calculated from the scatter plot was:
 $y = 0.2322x + 0.1959$.

We know that Fitts' Law is:
 $MT = a + b * ID$

Here, **a** and **b** are the regression coefficients. Thus,
 $a = 0.1959$
 $b = 0.2322$

Calculation of Throughput:

Throughput was measured as the quotient of ID/MT. The following is a scatter plot of the same:

