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Assignment 3 - Fitts' Law

1 Fitts' Law Optimization

1.1 Fitts' Law Examples

Driving a car –> hitting brake and accelerator (large pedal, small pedal, great distance)
Blindly use keys on keyboard (large enter key, small enter key, large/small spaces)
Pop-up menus/advertisement on websites (exit button always small, usually at an edge/bottom –> thus far away, always somewhere else, barely visible), firefox back button, windows menu button

Pointing example where Fits' Law does NOT apply: ??? Wack-A-Mole (Game) - since the game's intention is to make it hard to hit the moles it will try to break with fitts' law, or where design does not permit it –> placing Reply and Delete button close to each other, because they are most often used, may lead to mistakes –> navigation panes with drop down menus cause more cursor movement, but significantly help keeping order and grouping elements to reduce cluttering - although it might impede a fluent workflow –> unlock cellphone by complicatedßwipe is a real stumble stone for fluid workflow, but it is meant to be, for only this way it can actually ensure unintensional unlocking.

1.2 Keyboard redesign

Calculating the average movement time MT of pointing to the keyboard and then pointing to the call button.

MT_1 ... average Movement Time (old design)
MT_2 ... average Movement Time (new design)
$W = 5$ ... target width (call button or center of keypad)
$D_1 = 35$ ... target distance (old design)
$D_2 = 15$ ... target distance (new design)

a ... start/stop time of device (intercept)
b ... inherent speed of device (slope)
ID ... index of difficulty

General formula:
$MT = a + b \cdot ID$
$MT = a + b \cdot log_2(1 + \frac{D}{W})$

Calculation:
$MT_1 = a + b \cdot log_2(1 + \frac{35}{5}) = a + b \cdot log_2(8) = a + 3b$
$MT_2 = a + b \cdot log_2(1 + \frac{15}{5}) = a + b \cdot log_2(4) = a + 2b$
Result: $MT_2 = MT_1 - b$
The movement time difference between the two designs is b, which clearly rates the new design better.

2 Fitts' Law Evaluation

results of all 3 experiments –> screenshots of the 9 targets
Experiment 1: Touchpad –> Screenshot of result
Experiment 2: Mouse –> Screenshot of result
Experiment 3: Tablet / different User? –> Screenshot of result

Table with results..