HCI Lab Assignment - 3

Akashdeep S
181IT203

Fitt's law:

Demo Link: https://akashdeeps19.github.io/hci-lab/lab3/index.html

Fitts's law is a model of speed-accuracy tradeoffs used in human-computer interaction and ergonomics. It predicts the time required to acquire a target on screen as a function of the distance to the target and the size of the target. Fitts's law is used to model the act of pointing, either by physically touching an object with a hand, finger or virtually or by pointing to an object on a computer monitor using a pointing device. It was proposed by Paul Fitts in 1954.

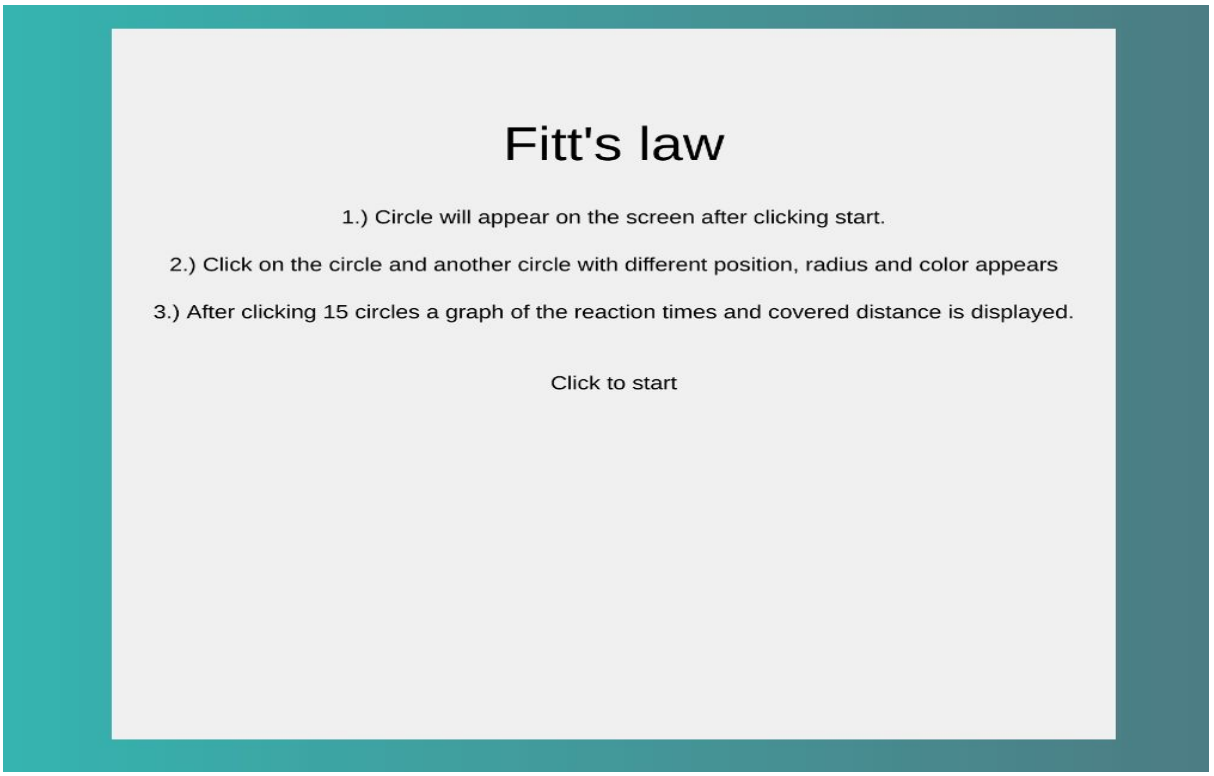
Physical interpretation and application of Fitts's Law

- Big targets at a close distance are acquired faster than small targets at long range.
- Target acquiring difficulty increases by one unit for each doubling of distance and halving of the width of the target.
- Fitts's Law can be used to evaluate alternative interaction methods in Graphical User Interface (GUI).

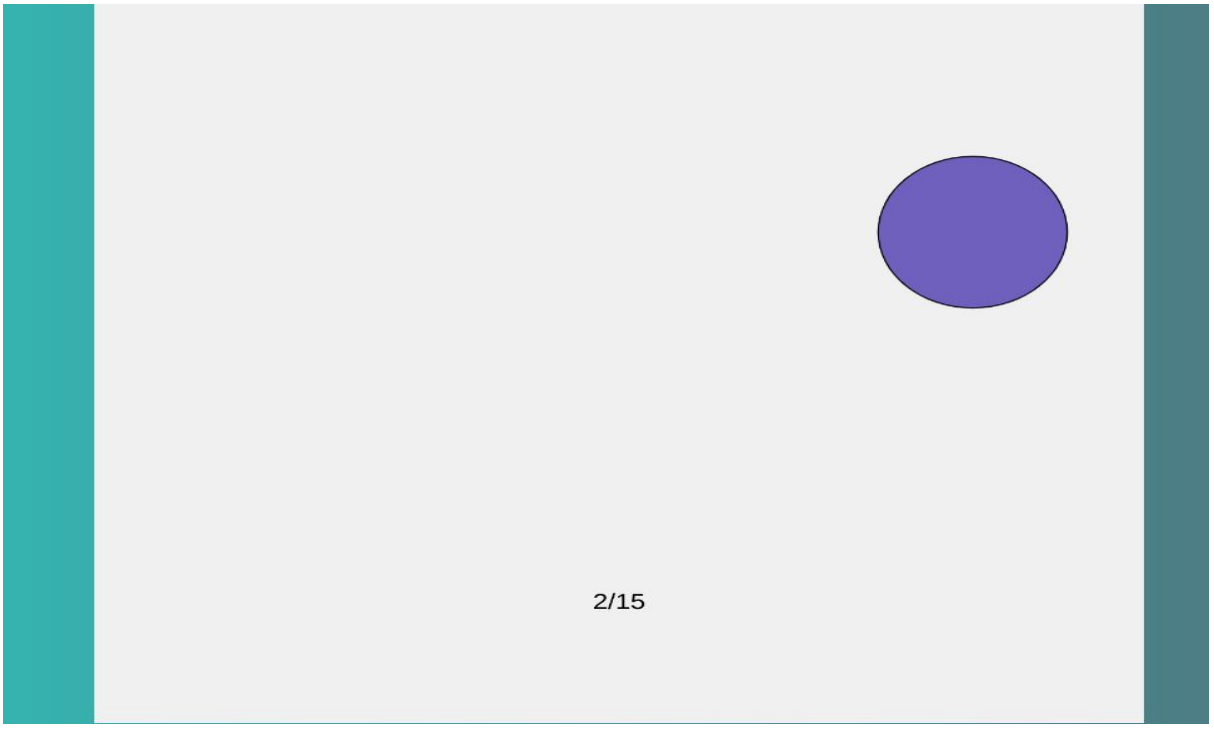
To understand Fitt's Law better, I have built a simulator. The simulator helps us observe the effect of target distance and target size on the GUI target selection time. You can apply Fitt's Law in designing and placing widgets on the computer interface.

In the simulator, we have circles of random sizes and at random distances being displayed on the screen.I then calculate the time of response for different radii and different distances and plot them against each other to understand how the size of the icons influences the speed of selection.
We perform this experiment with a mouse, with a laptop touchpad, and with a touchscreen, and then compare the performances.

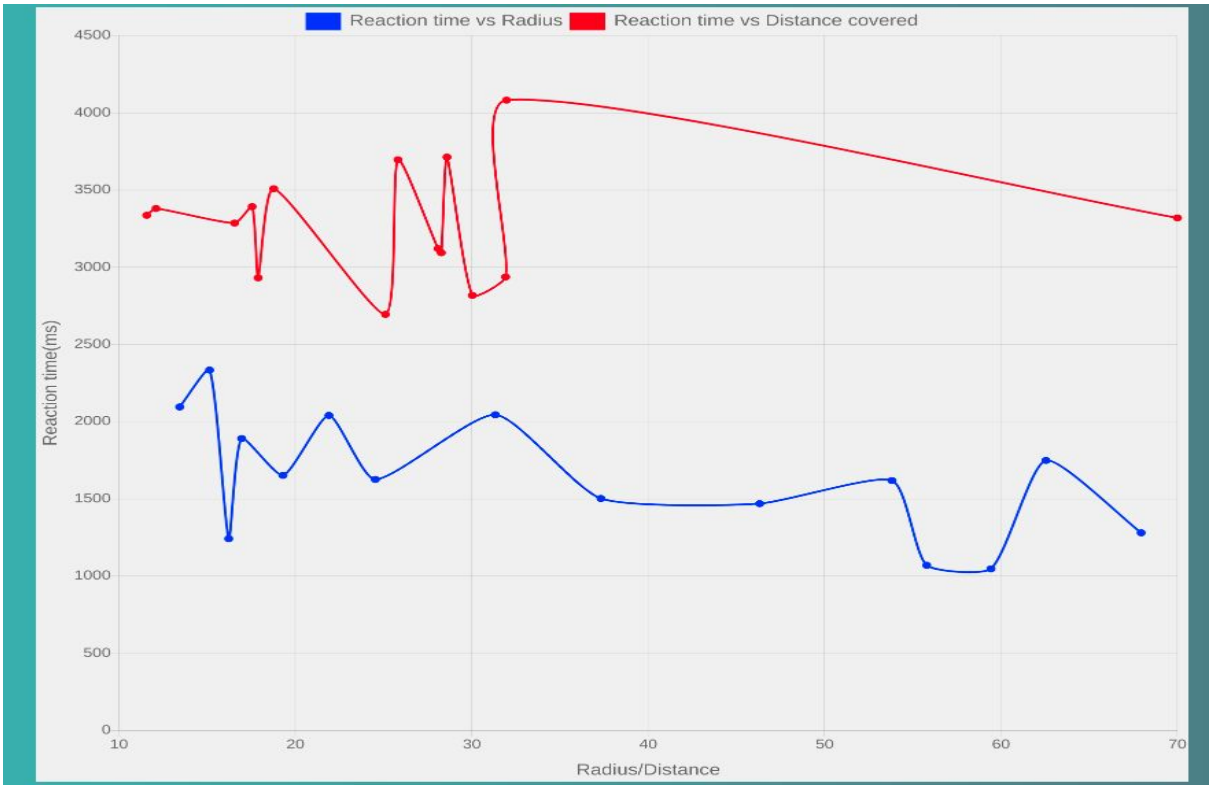
Screenshots:



Instructions page. The instruction for using the UI is displayed on this page

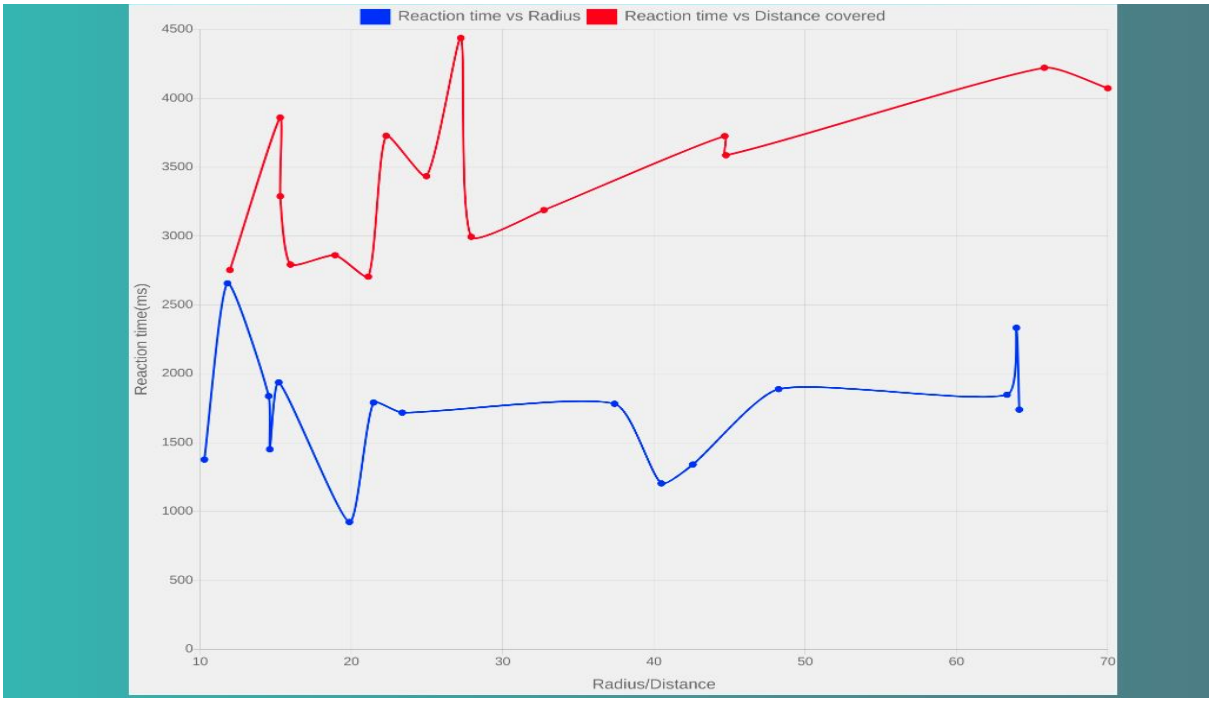


A Random circle is displayed at a random position on the screen. The user has to click this.

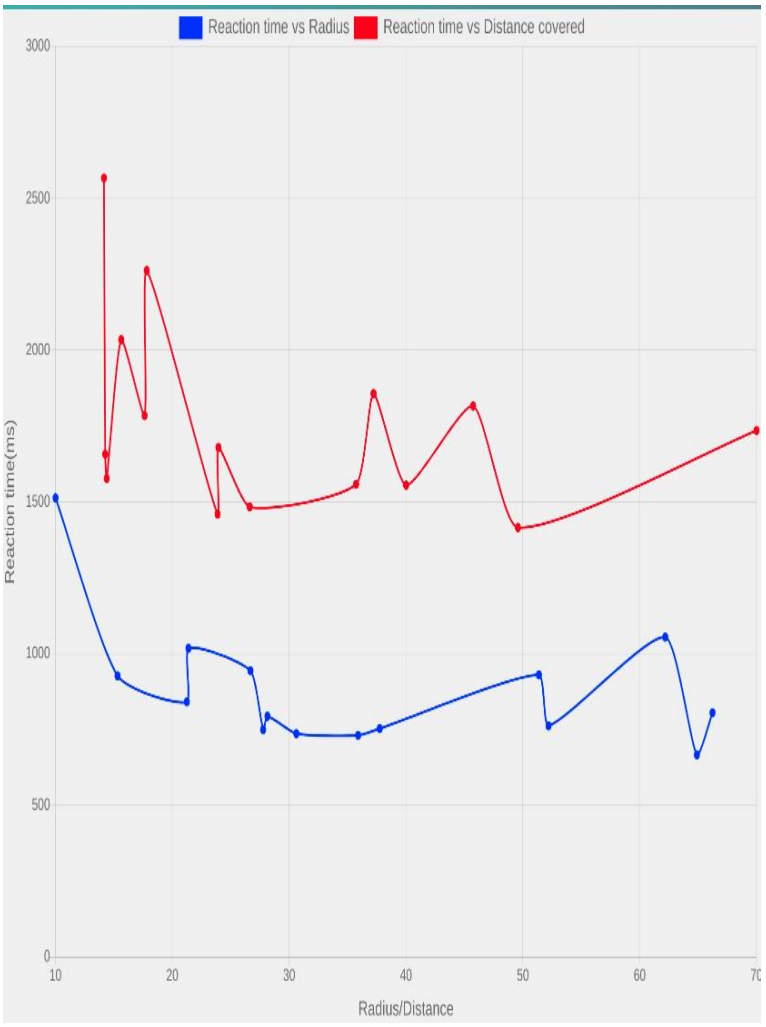


Reaction times in laptop touchpad

Graph of reaction time vs radius and reaction time vs distance is displayed. The graphs for a mouse, the touchpad of a laptop, and the touchscreen of a mobile are plotted and compared below.



Reaction times using mouse



Reaction times in touchscreen of mobile

Inferences:

1) An inverse relationship is seen in all three devices, that is the inverse relationship between the radius of the element and the response time. Larger elements can be identified with a lower reaction time. Smaller elements require more reaction time from humans,
2) A direct relationship between the distance between successive elements and response time is seen. If the distance between 2 successive elements is high, the response time is also high. If the distance is low, the reaction time is low
3) The touchscreen of mobile is simple to use hence the reaction times recorded for a touch screen are the lowest. The touchpad of a laptop is relatively simpler to use compared to a mouse. Hence the reaction times recorded are intermediate between the mouse and touchscreen. The mouse is the hardest device so the reaction time recorded is the highest.