

Overshoot distance and target size

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Introduction

When designing a digital environment, one must consider the size of the buttons that will be placed. It is generally believed that the bigger the button is, the easier and faster is to click on it.

The purpose of this research is to find whether this statement holds by examining the relation between the size of the button (radius of target) and the distance the cursor travels passed the target (overshoot size).

Methods

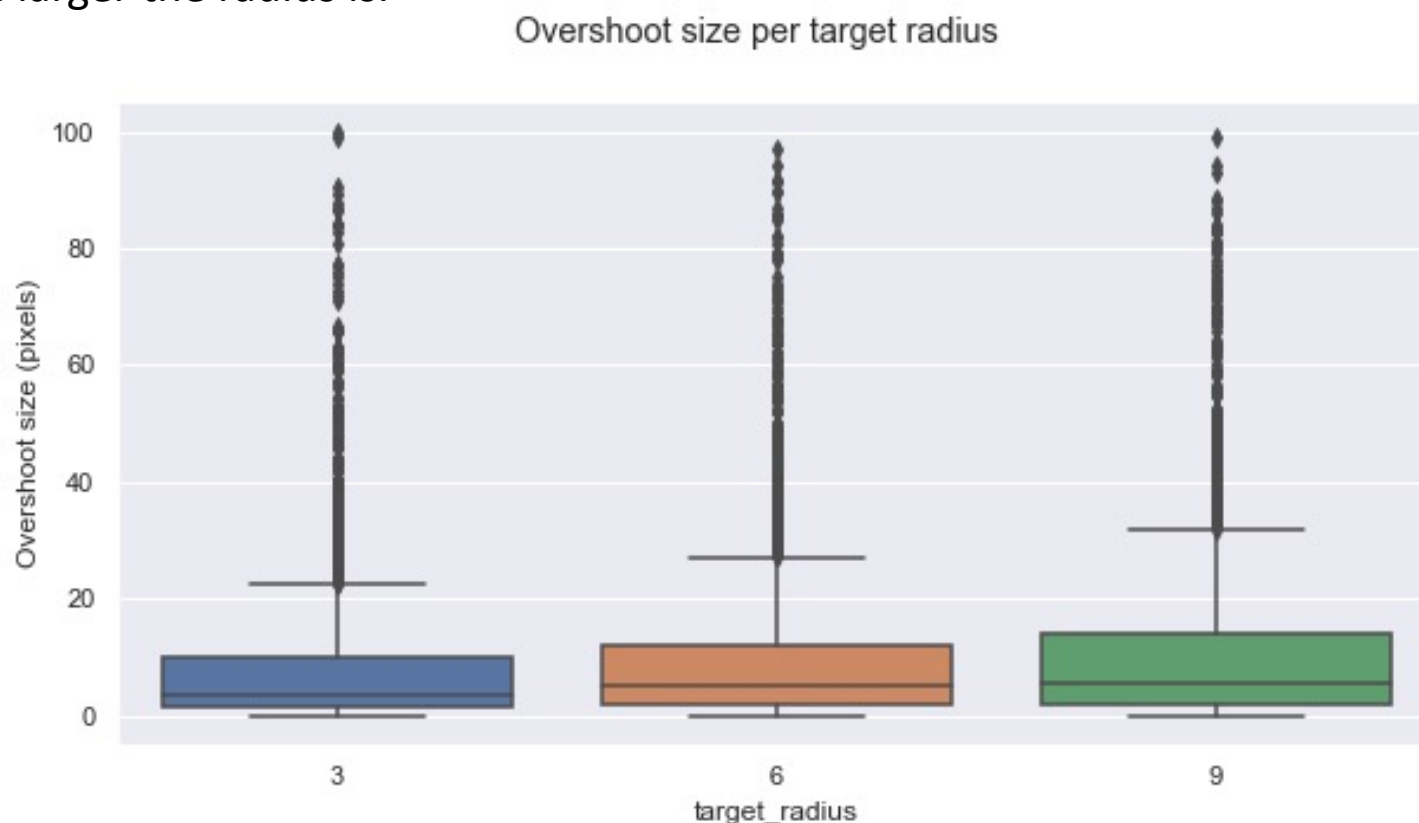
The experiment conducted to collect data is as follows. Students must place their cursor in the center of a grid and after some seconds press a circular target of varying size (3, 6, 9 pixels).

Before the data were analyzed outliers were dropped. This was done by setting a limit of mean plus standard deviation for total time and width. Afterwards, boxplots were made to examine the overshoot time in relation to the radius target.

An Anderson-Darling test was then used to find if there are more overshoots when the target is smaller. The p-value found is: 0.18620356973940477 which indicates that difference between the number of overshoots with small targets is close to that with large targets.

Results

In the figure below the overshoot size per radius is shown. As it can be seen the horizontal line in the center of the boxes – the mean value – increases slightly as the target radius increases, something that was expected since p-value is larger than 5%. The fact that larger overshoot sizes are more as the target radius increases is also visible by the upper quartiles and whiskers that are higher the larger the radius is.



Discussion

An aspect that was not taken in mind when examining the data was the velocity and the time that took to reach the target. The experiment sometimes might not resemble real world situations as people might be more focused in successfully completing the tasks. This might make them careful to hit a target, as small as it might be, without many correction movements producing data that might be deceiving.

Conclusion

Contrary to what the hypothesis was, it seems like smaller targets are hit with more precision than bigger ones. This might be a result of overconfidence (when it comes to bigger targets) or more precise movements (when it comes to smaller targets).

So, the conclusion is that indeed there is a relation between target size and overshoot size, but it is inverse proportional.