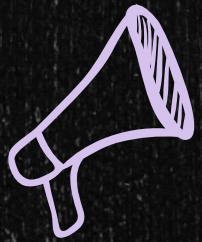
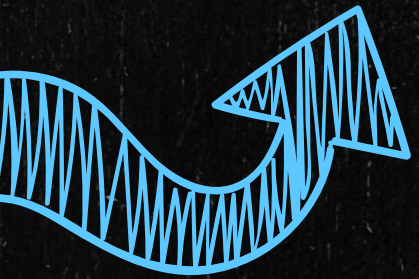
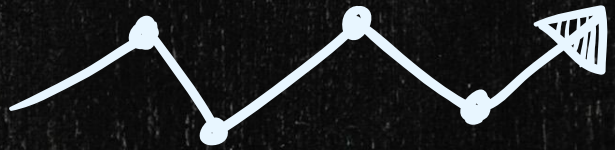


A Study of Efficiency Between Conventional Keyboard and Stylus Input Apple Pencil as an Example

ECS 189H 2021 FQ

Group 8

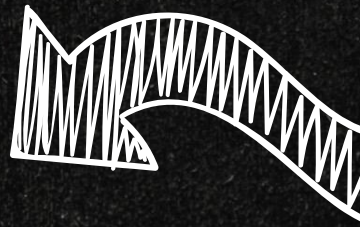
team member names: Amaan Khan, Xiangyu Li, Zheming Pu, Dingxian Wang

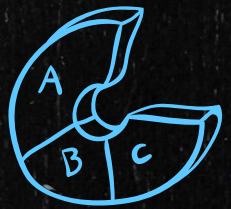

Overview

1. Background
2. Methods
3. Pilot Study
4. Lessons learned

1



Background and Motivation



Background

Background

1. Improvements in hardware manufacturing technology leads the cost of production lower than before.
    a. The price of current tablets is affordable because more and more companies start to provide their own tablets to customers.
        i. Apple iPad
        ii. Amazon Fire
        iii. Samsung Galaxy Tab
        iv. etc
    b. The outcome is that more and more people are able to experience tablet usage. They could use it to do whatever they want.
2. The emergence of corresponding applications has led to a sharp increase in the number of users using tablets, forming a complete ecosystem with hardware together.

Motivation and Related Work

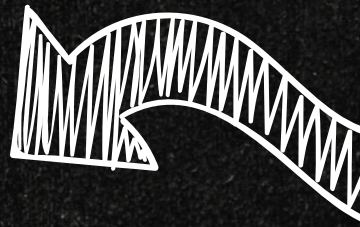
Motivation: There are more and more users using tablet computers. On the contrary, there is not much research on tablet use, or even scarce.

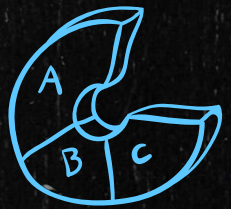
Related Work:

1. The user experience of tablets whiling using iTV applications by Jan et al
    a. Both young people and the eldery prefer using tablets than free hand gesture and remote control to operate iTV applications by using the mirror feature
2. Ken et al investigated the sensing technology which are integrated with tablets and styluses
    a. Combined with the sensor embedded in the stylus, tablets' sensors could be able to identify super subtle gestures. By doing this, this combination will provide users extremely powerful user experience and filter unintentional motion at the same time.
3. Hendrik's research related on tablet usage
    a. Hendrik and colleagues focused on why, where, when people use tablets and investigated what users do with tablets. They found that almost every person have a specific purpose to use tablet. Usually, they expect only tablet could help then complete the task.

2

Method





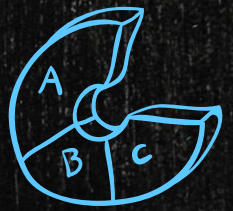
Methods

Research Method: Experiment

The experiment is A/B test, within subjects

Recruitment by survey

The participants are given two videos, A and B, about knowledge they didn’t know before. Half of the participants will watch A and take notes with keyboard, watch B and take notes with stylus, and the other half will do A with stylus and B with keyboard.



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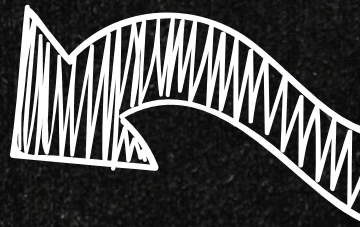
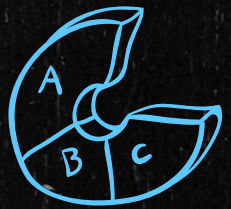


Pilot Study & Data Analysis

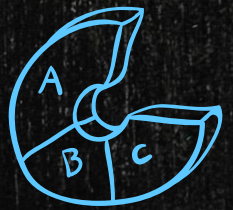


Pilot study and Data Analysis

- Only two participants were included because of time arrangement.
- Here is the example data that we collected from our pilot experiment.

Participant A	Video 1 with Apple Pencil	Video 2 with Keyboard
total Key-points Recorded	11	24
key-points possible	13	30
Percentage	0.846153846	0.8

Participant B	Video 1 with Keyboard	Video 2 with Apple Pencil
total Key-points Recorded	7	17
key-points possible	13	30
Percentage	0.538461538	0.566666667

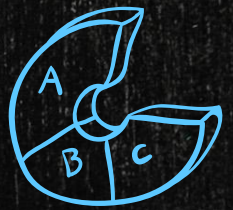


Pilot study and Data Analysis

- Our experiment data indicates that there is a relationship between different input method and efficacy. In our case, the apple pencil have advantage compared to the keyboard.

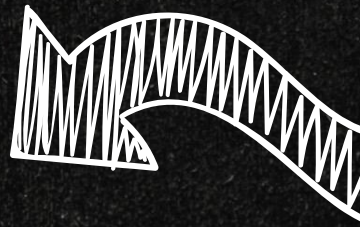
- This pilot study also noted some drawbacks of our experiment.
- The difficulty of two videos we are using for the experiment is not consistent.
- We didn't collect enough data to generalize our result. Further experiment should be involved to give an accurate result.

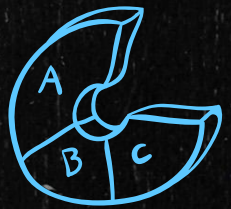
- More details about the data and analysis will be included in the report



4

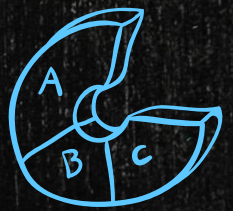
Lessons learned





Lesson Learned

- We got first hand experience with experiments while conducting our pilot study
  - collect data
  - observations
  - experiment design
- using the data we collected we learned how to analyze it through graphs/tables
- we learned how to create survey questions which are designed to give us specific form of data
- teamwork and collaboration



Thank you!

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Reference

Jan Bobeth, Johann Schrammel, Stephanie Deutsch, Michael Klein, Mario Drobics, Christina Hochleitner, and Manfred Tscheligi. 2014. Tablet, gestures, remote control? influence of age on performance and user experience with iTV applications. In Proceedings of the ACM International Conference on Interactive Experiences for TV and Online Video (TVX '14). Association for Computing Machinery, New York, NY, USA, 139–146. DOI:https://doi.org/10.1145/2602299.2602315

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