

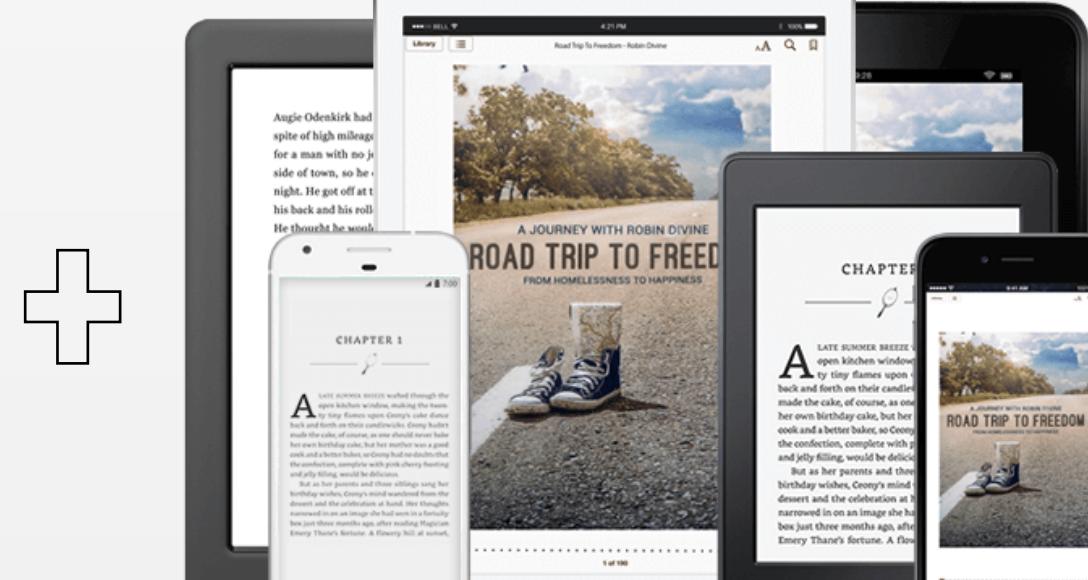
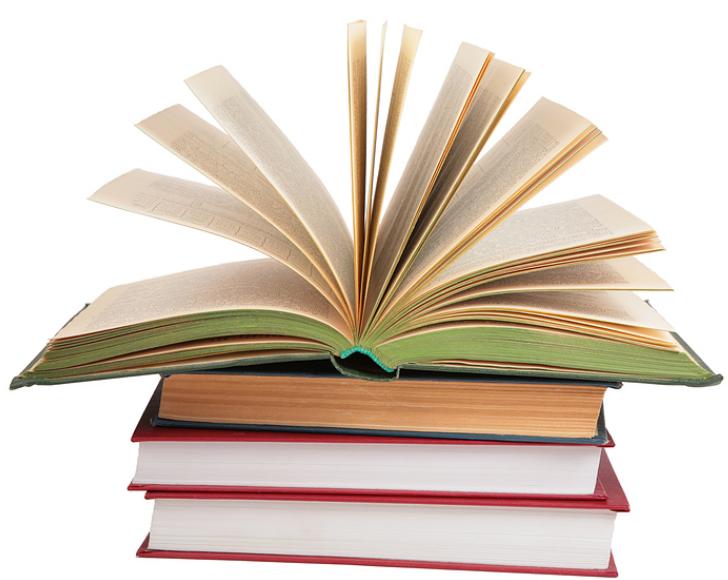
DreamBook: Physical E-Book

Pankhuri Choudhary, You-Yi Jau, Gaurav Parmar, Harish Duwadi, Kevin Barron

UC San Diego, CSE 118/218, Fall 2018

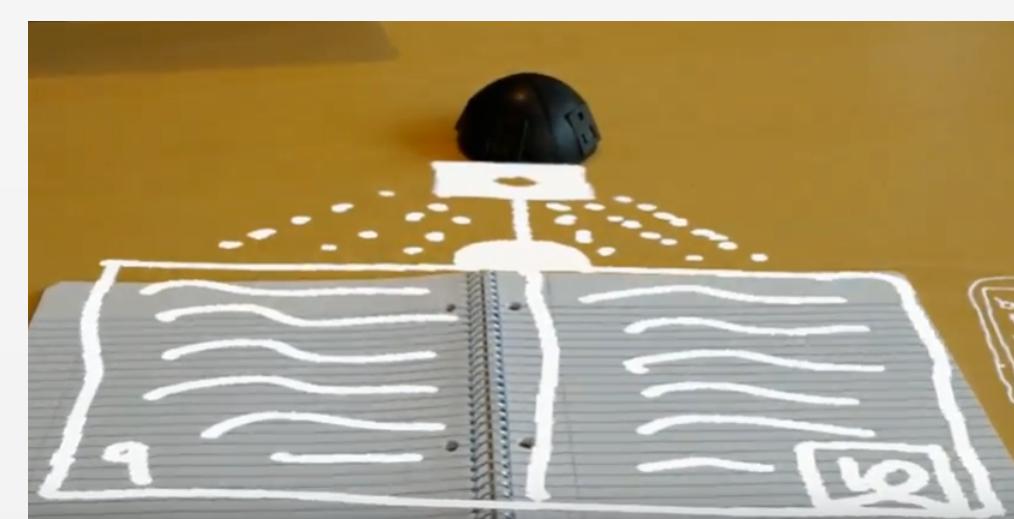
Advisor: Prof. Nadir Weibel, Danilo Gasques, Janet Johnson

Motivation

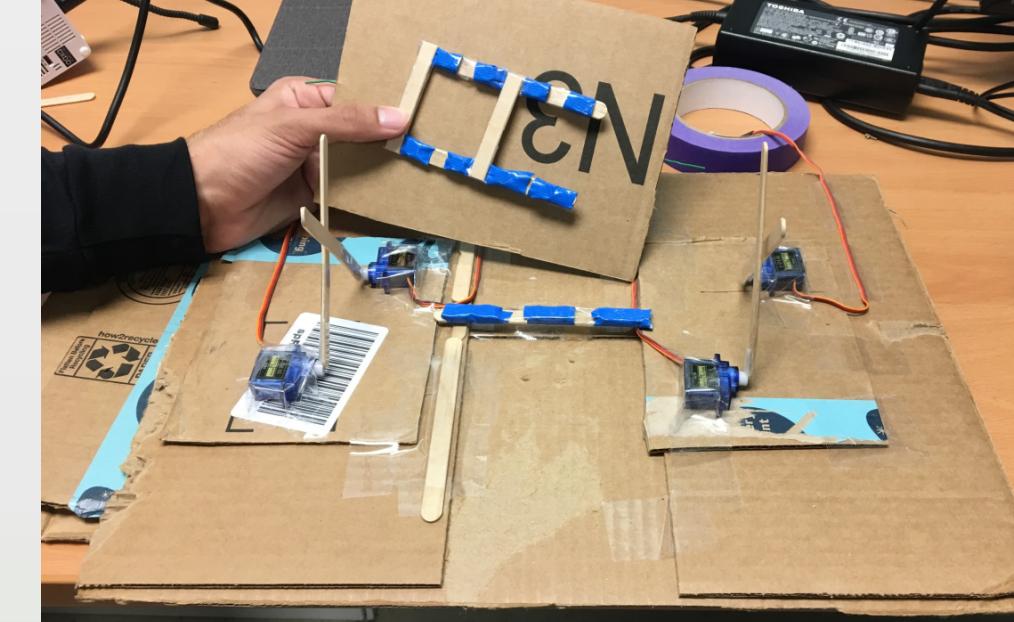
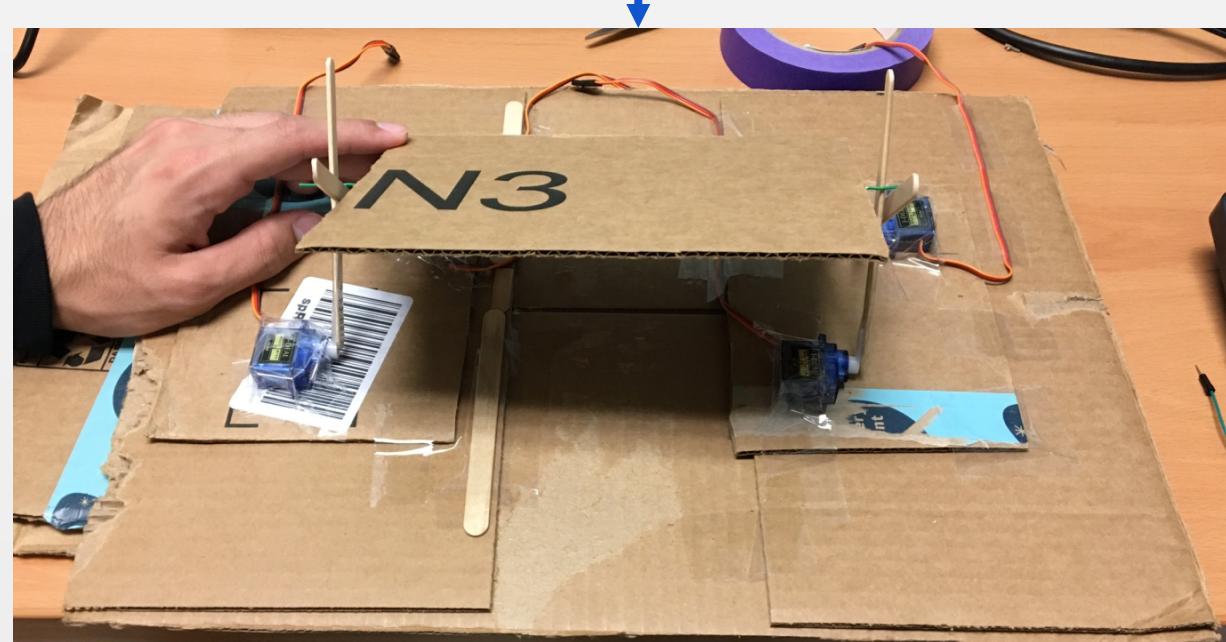


- E-Books compromise the experience of a real book
- Buying physical books is not cost effective over time
- Renting physical books is inconvenient and time consuming
- DreamBook provides the real book experience with the benefits of an E-book: ease of access and cost effectiveness

Design

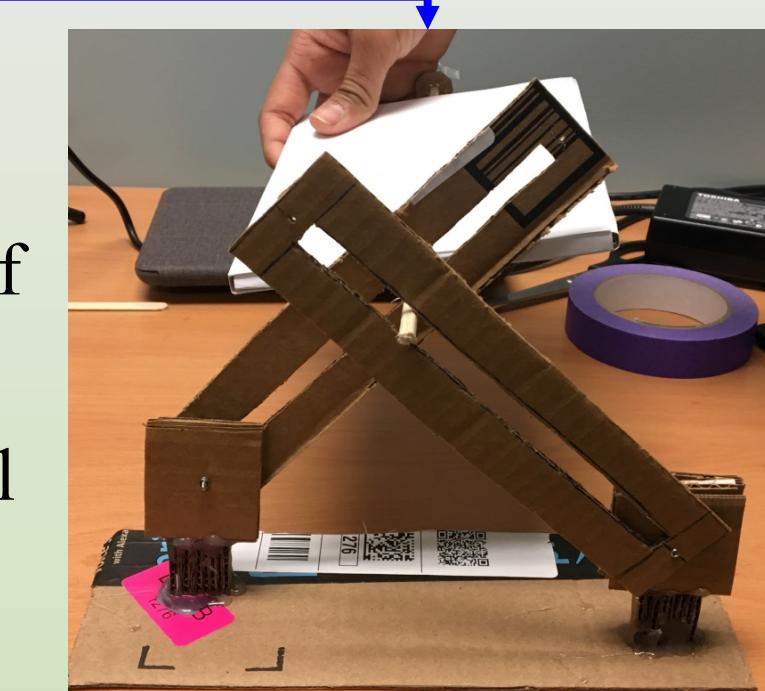


- Raise the page with motors
- Very unstable to use



- Add magnets for increasing stability
- Not help with stability at height

- Removed the automation of raising the page
- Using rails to allow manual control



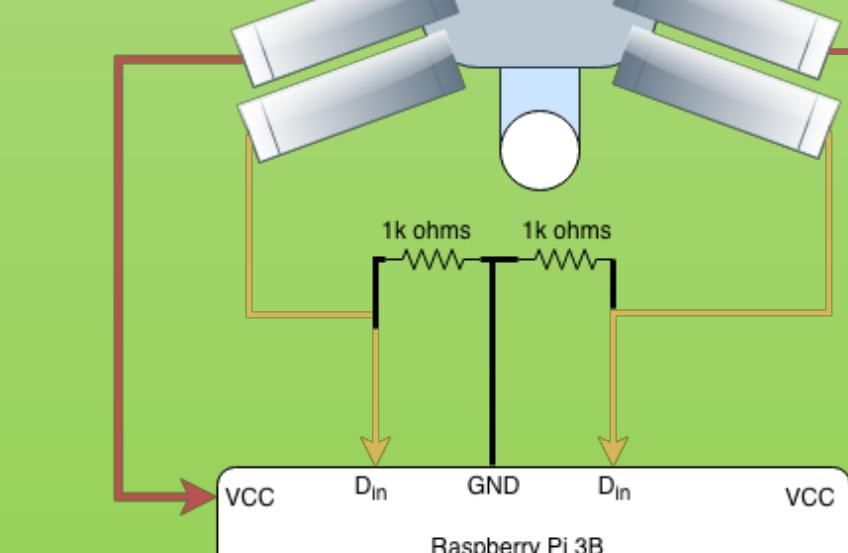
Final Design

- Increase page thickness for stability
- Position page at an incline
- Tactile feedback associated with forward and backward flips

Page Flip Detection

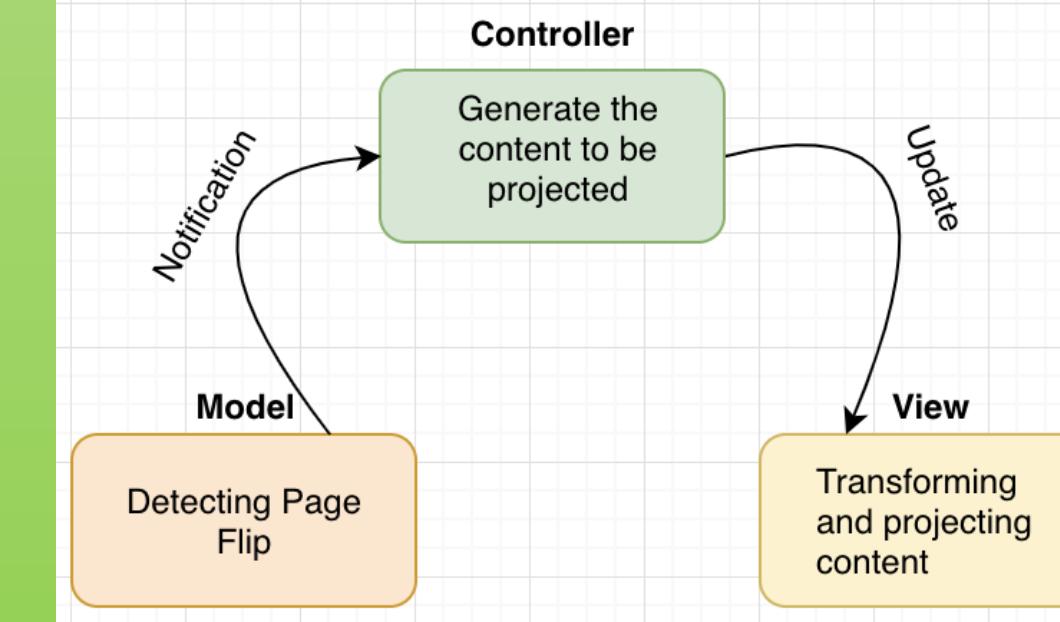
• Hardware Design

PAGE



• Software Design

- Used the MVC design pattern
- Divided tasks into modular subcomponents
- Unit testing for each module



System Development

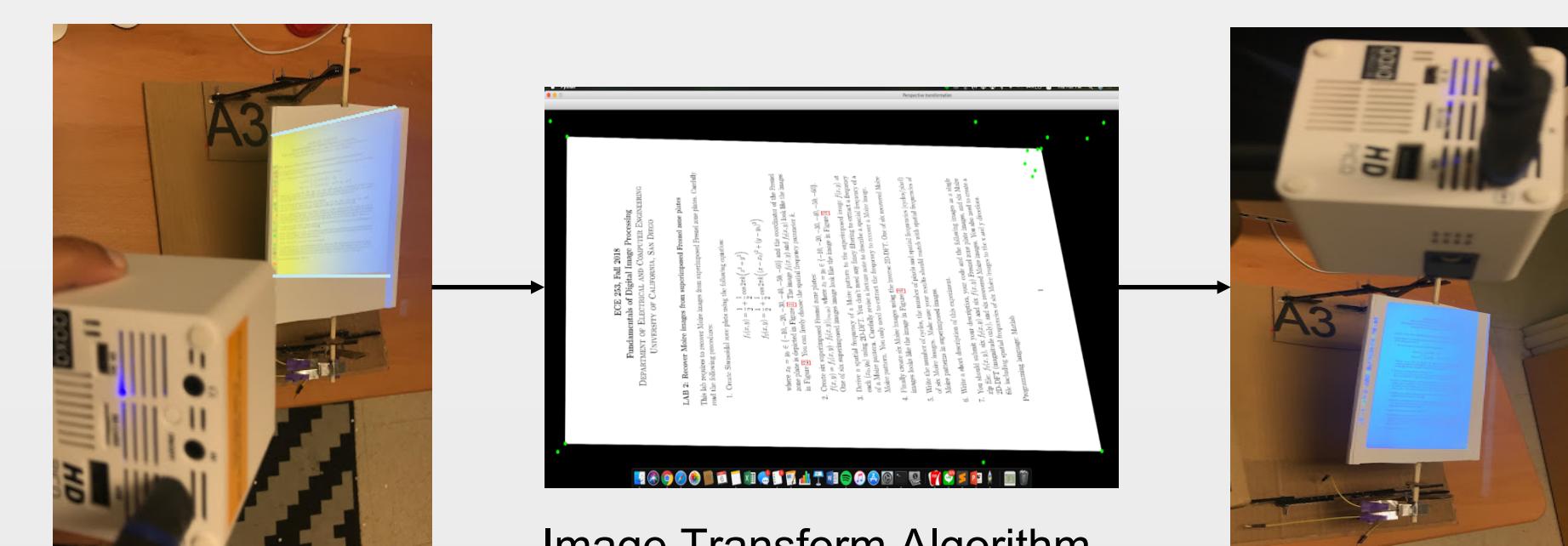
System Overview

Hardware :

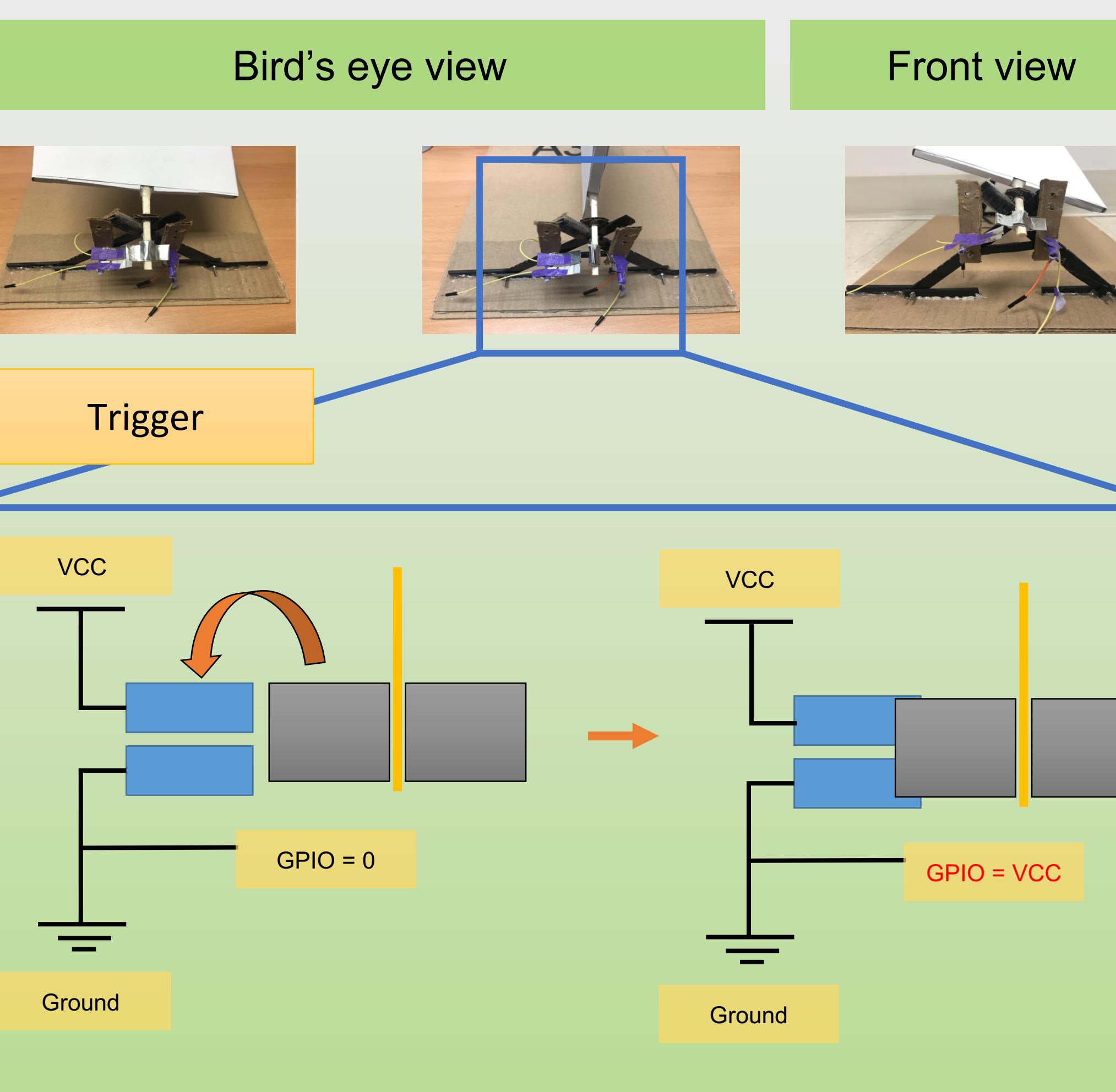
- R Pi
- Pico Projector



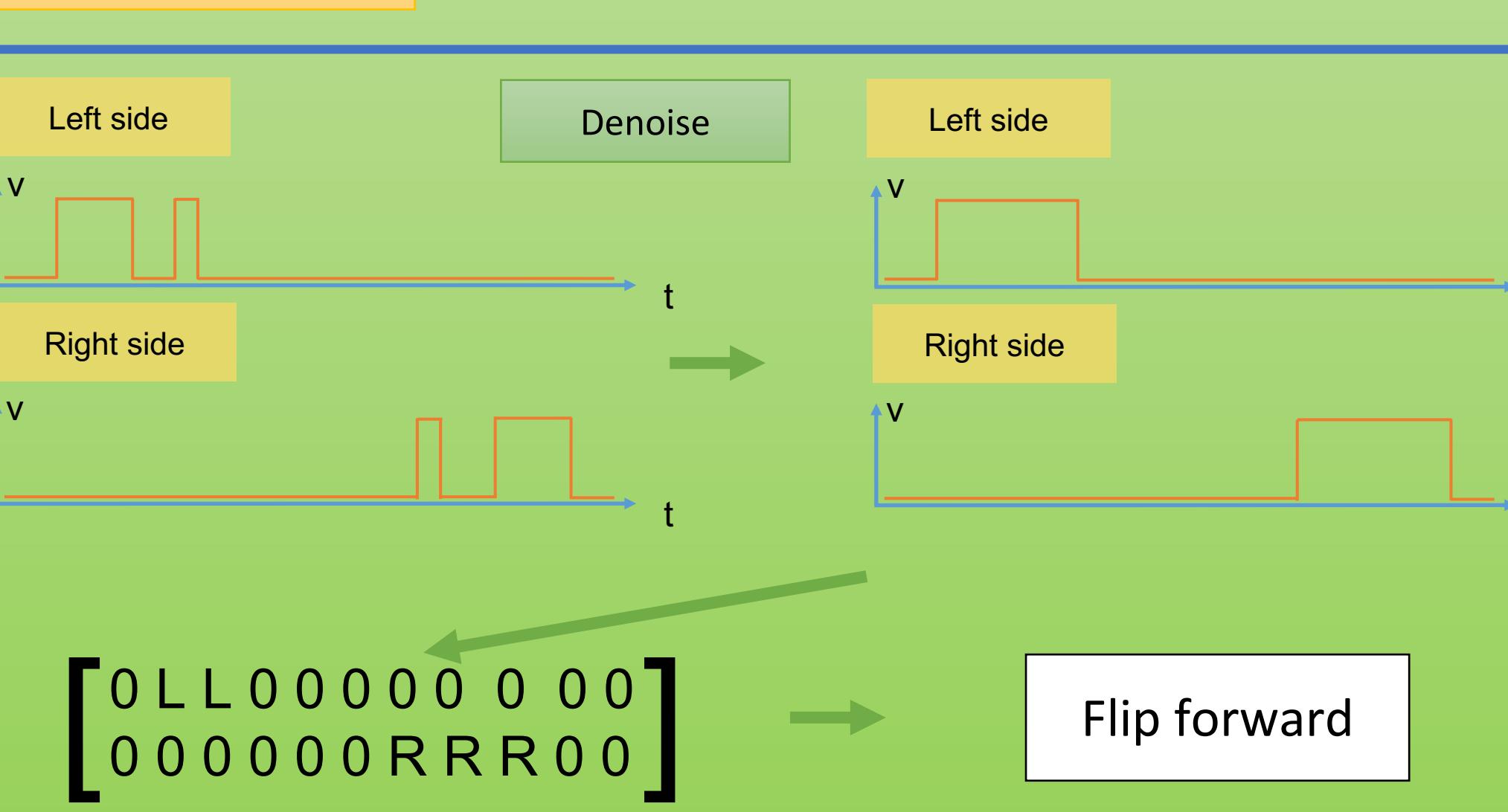
Calibration



Page Flipping

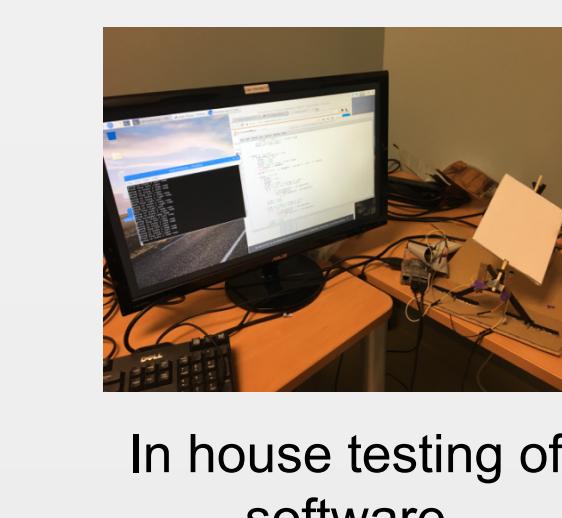
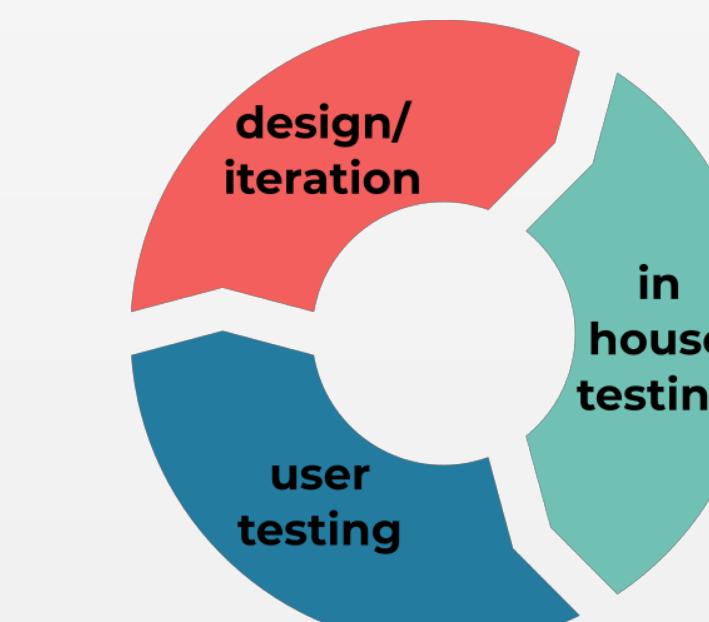


Signals

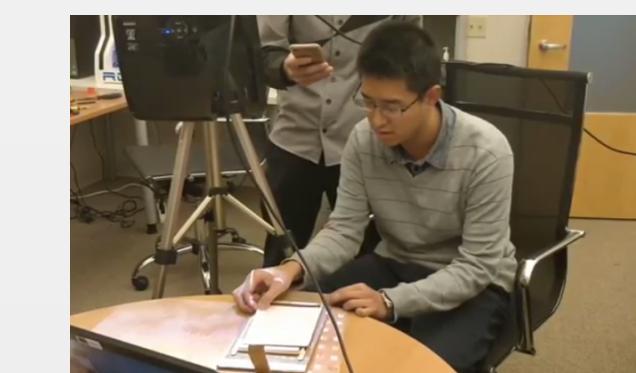


Testing / Evaluation

Iterative Usability Testing



In house testing of software



Usability testing session



Usability testing session

- Design - iterative improvements based on user feedback
- In house - test functionality of newly implemented features
- User - validate usability of new features

- Evaluation based on correct projection transform, ability to navigate across pages with ease, and intuitiveness of the interaction interface.

Conclusion

- Develop semi-portable device that does not require extensive setup
- Develop an intuitive interface for navigating a digital document on a physical device
- Retain the characteristic of tactile feedback of traditional books

Future Work

- Provide further features to the users
 - Take notes
 - Jump to a page
 - Bookmark pages
 - Narrate text
- Make the device more portable
- Interface with other devices like mobile phones and laptops

References

- [1] Steimle, J., Jordt, A., and Maes, P. Flexpad: Highly Bending Interactions for Projected Handheld Displays. In Proc. CHI'13, 2013.
- [2] Khalilbeigi, M., Lissermann, R., Kleine, W and Steimle, J. FoldMe: Interacting with Double-sided Foldable Displays. In Proc TEI'12, 2012.
- [3] David Holman, Roel Vertegaal, Mark Altosaar, Nikolaus Troje and Derek Johns PaperWindows: Interaction Techniques for Digital Paper. CHI 2005