Summary

The hand is a dexterous and intuitive part of the body. Steve Jobs was right when he suggested that it was the easiest control system to implement. As a result, it makes the ideal input interface for effectively all digital devices that we use every day. However, most devices that we use rely on varying systems. Computers rely on keyboards and mice, smartphones have complicated GUI’s, and gaming consoles all use different controllers. Rather than differentiating between all these technologies, a simpler approach would be to use a universal input system, one that uses the hand as a gesture based input system.

Deliverables

* Glove Based Input System Using Flex Sensors, Accelerometers, an Arduino, Bluetooth Module, Battery
  + Can detect 5 distinct movements and send that sensor data over Bluetooth
* Android Application
  + Can change music
* Desktop Application
  + Can enter keyboard values and move mouse/click
* Kickstart website with demo video, product proposal, weekly reports, team members

Critical Features

* Recognized down tilt, up tilt, right tilt, left tilt, and click gestures on glove
* Comfortably wearable around the hand
* Be able to connect to devices remotely through Bluetooth and send the appropriate data

Performance Metrics

* Accuracy
  + Responsiveness
    - Should be able to detect all five distinct gestures quickly and correctly
* Power Consumption
  + Last for a long time and charge quickly
    - Should be able to last at least 8 active hours and recharge within an hour
* Size and Comfort
  + Sleek design that can fit onto the hand easily without burden
    - Should be comfortable to wear all day

Technical Details

* Hardware Setup
  + Flex sensor should be attached across the knuckle
  + Accelerometer attached to the center of the glove
  + 3d printed box containing all the various electronic components
    - Arduino
    - Bluetooth module
    - Battery + Boost Module/charger
    - Switch to turn on
* Software Setup
  + Read data in from Bluetooth sensor values
    - Consistent structure of data
  + Use set of predetermined accepted values to create desired results in various applications
  + Create two or more types of device applications to demonstrate universality

Milestones

See website calendar at pie306.github.io/gLOVE/

Responsibilities

* Andrew Nguyen – Hardware Design, Android Application
* Franklin Shih – Desktop Application, Website
* Son Pham – Full Stack

Materials and Budget

See BOM under downloads on website at pie306.github.io/gLOVE

Risks and Risk Mitigation

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| --- | --- | --- |
| Risk | Stage | Risk Mitgation |
| Sensors Reading | Early | Figure out how sensors fit into circuit before inserting |
| Bluetooth Transmission | Middle | Read various tutorials |
| Form Fitting | Late | Use as small parts as possible |
| Unable to Develop Applications | Middle | Readjust goals and expectations for the apps |