PalmPointer

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EECS 373: Proposal for Final Project

Section 1: High Level Description

Our project design is a wearable glove that acts as a computer mouse by using FSRs in the thumb, index and middle fingertips to act as clicking inputs and an IMU sensor within the palm to record cursor movement from the hand's movements. In addition, it will be able to be used in multiple axes, allowing for use of the glove on any surface or no surface at all.

The glove will be able to be easily turned on and off in order to create a seamless switch between mouse and keyboard use. It will include the ability to change between two modes (soft surface and hard surface) by use of a switch on the back of the hand as well as a customizable DPI, changed by the press of a button. The glove will also include a small LCD display on the back of the hand, displaying the current mode and DPI.

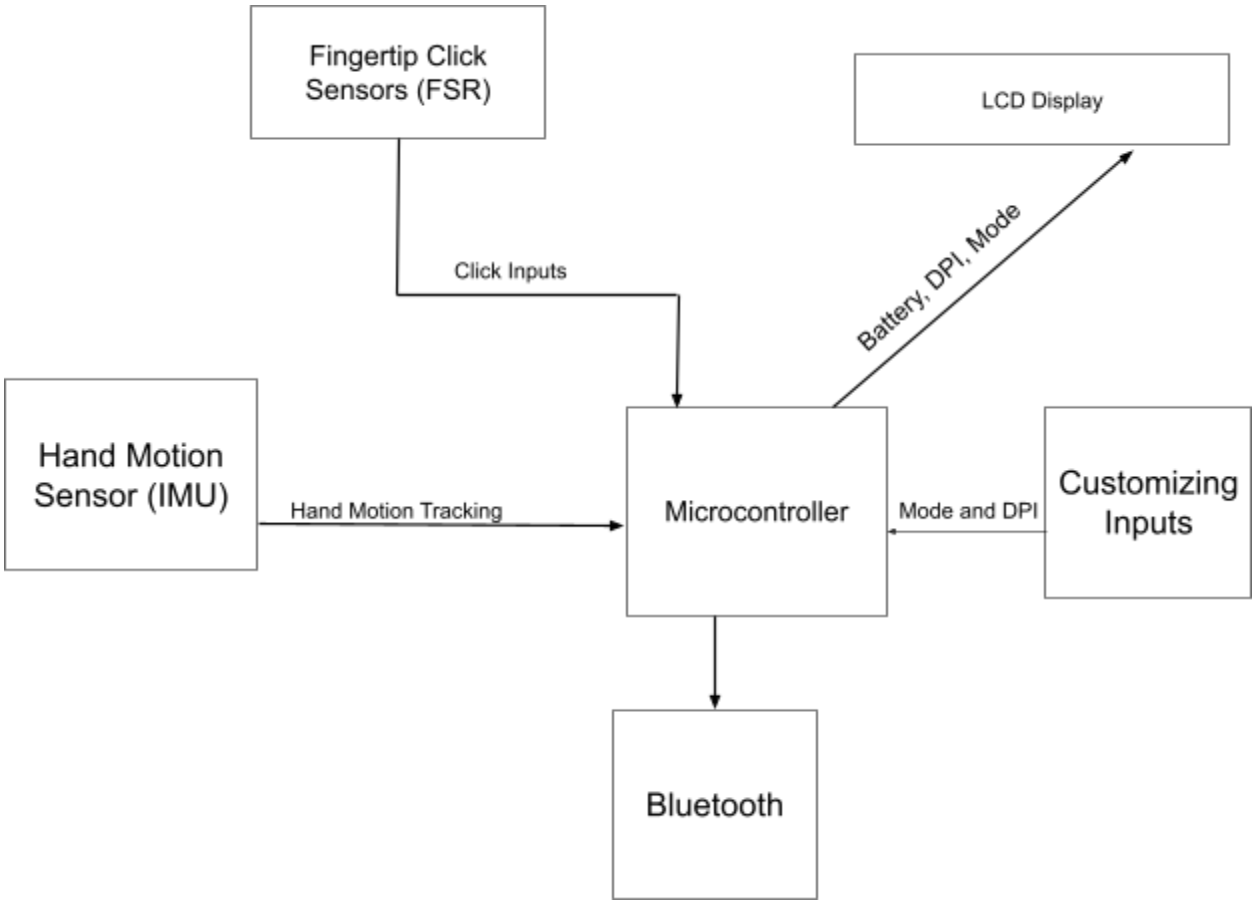
The glove will communicate over Bluetooth to another board, hooked up over USB to a computer. The receiving board will use HID to emulate the inputs of a normal mouse.

Major Functions:

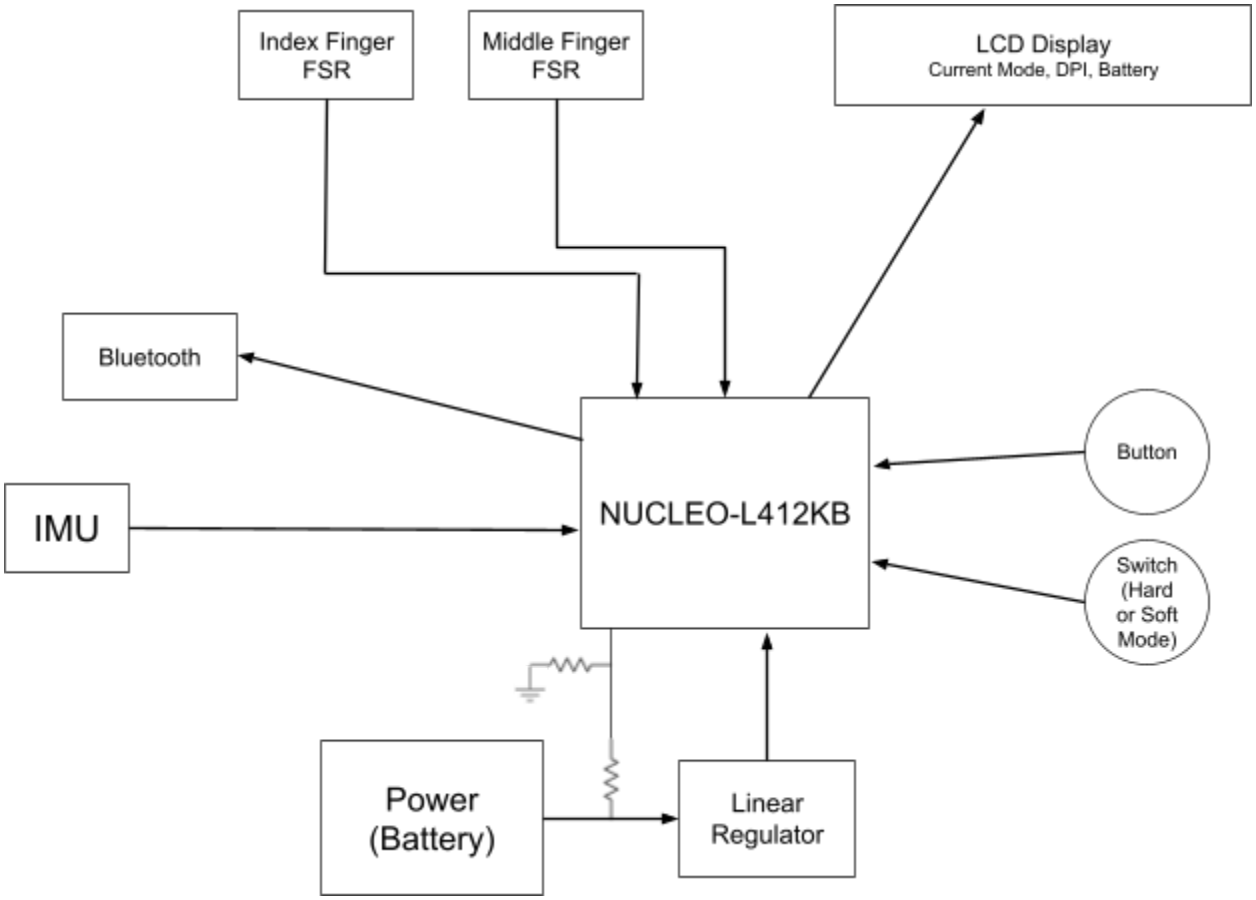
- Left click function emulated by tapping index finger FSR on any surface
- Right click function emulated by tapping middle FSR finger on any surface
- Cursor moves with palm
    - DPI can be adjusted by cycling through available options with the use of a button
- Drag mode enabled while index finger FS is held enabled
- Disable the glove by rapidly double pressing both index finger and middle finger FSRs
    - Re-enable the glove in the same manner
- Two modes depending on surface being used for clicks
    - Since soft and hard surfaces will require different amounts of pressure to trigger a response by the FSRs, we will have to account for this.
    - Hard surface
        - Voltage threshold for FSRs can be higher in order to ignore erroneous inputs such as resting hand on a table
    - Soft surface
        - Voltage threshold for FSRs must be lower to register a click on a softer surface such as palm or furniture
    - Switch between modes with switch on the back of the hand
- LCD screen on the back of the hand to display current mode, battery, and DPI
- Second board to receive sensor data and convert it into mouse inputs

- Bluetooth modules to enable communication

Section 2: Block Diagram



Section 3: Component Diagram



Section 4: Component List

In Stock:

- LCD Display
- Linear Regulator
- Button
- Switch
- Battery Pack
- Bluetooth Communication Board

Non-Stock:

- IMU
  - BHI160
- Force Sensitive Resistor
  - Fingertip-size FSR
- Glove
  - Timberland Glove
- MCU
  - NUCLEO-L412KB