6.111 Final Project Checklist
Team Pivot
Nestor Franco, Andrew Kurtz

Project Checkoff Checklist

Minimum Goal

Our minimum goal will consist of successfully interfacing all of the hardware (IMU → Mojo → Teensy → Computer) in order to move the mouse cursor in a computer screen. We will use just one set of measurements (only accel or only gyro) to control the cursor, and also implement single left-click functionality.

Regular Goal

Our regular goals will give much needed updates to the basic functionality, which will make it operate more like a normal mouse that you might find today. This would include improved accuracy by means of sensor fusion, the ability to differentiate between a single click and a double click, the ability to differentiate between a left click and a right click, and the ability to scroll up and down. The Mojo board would also be housed in a 3D printed case, to feel more like an actual controller.

Stretch Goal

If all the other goals have been achieved, then we can create an improved controller by adding user customization options, such as user-defined cursor sensitivity, user-defined gestures (e.g. drawing a circle goes back a webpage), and customizable buttons (e.g. set one of the customizable buttons to be alt+tab).
Another advanced feature could be the use of ridged grooves on the controller housing, which would create specific vibrational patterns when you run your finger over it, and we could use a FFT to detect this pattern and translate it into a mouse function.

Bulleted Checklist

- Minimum goals
    - Ability to move mouse via serial interface
    - Ability to move mouse via planar motion of the device
        - Convert velocity of device to velocity of cursor
    - Ability to register single Clicks (tap detection)
        - Threshold + timeout
    - Enable control based on button

        - Sets the “zero” orientation
    - No sensor fusion only uses either accelerometer or gyro

- Regular goals
    - 3D printed enclosure
    - Differentiate between single click and double click
    - Left vs right click
        - Start with hardware button
        - More advanced could have some type of “single finger vs two finger tap detection”
    - Scrolling
        - Flicking device up or down (perpendicular to plane used for cursor control) for page up/page down
    - Sensor fusion

- Stretch goals
    - User customization
        - Gestures
            - Drawing shapes
        - Extra Buttons
        - Sensitivity buttons
    - Super dope scrolling or accessory buttons
        - Textured surface on device which you rub your finger over, uses FFT to detect.