P^3

Poor to Proper Posture

OCTOBER 16, 2019

Advisor: Prof. Wolf

Team Members: Karl Shao, O-Dom Pin, Kiet Tran, Tong Shen

Team members

Karl

- Haptic Feedback Integration

- Microprocessor Programming

- Website

O-Dom

- Curvature Algorithm

- Power Supply

- Analog Circuitry

Tong

- Angle Sensor Integration
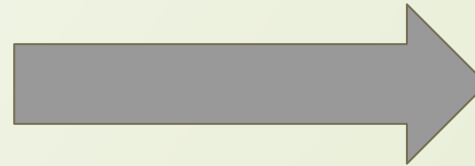
- Microprocessor Programming

Kiet

- PCB Design

- Analog Circuitry

The Problem

The Modern World

- More screen time

- More sitting

- More stationary

 BAD POSTURE

Existing Solutions

- Forced to stay in proper posture all the time
- Uncomfortable
- Strain on the back
- Hurts underarm
- Hard to find proper size that fits everyone
- Doesn't stop the habit of hunching
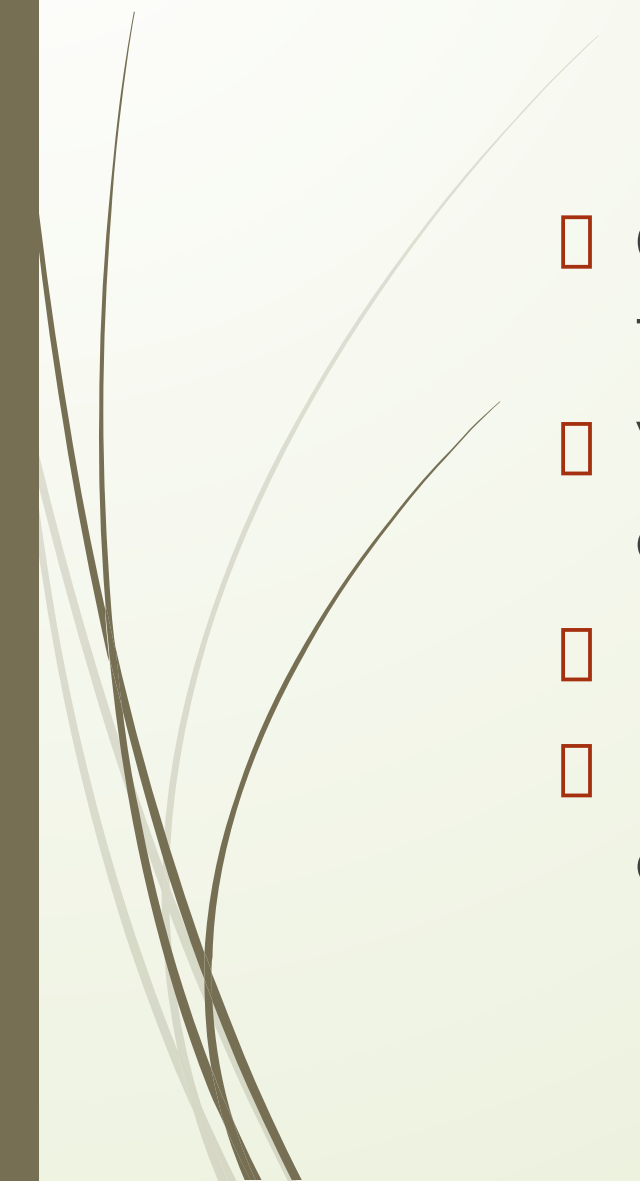- Doesn't focus on both lower and upper back

P^3 - Our Solution

- Detect User posture using curvature sensor
- Vibrate at the most problematic area to notify user's bad posture instead of forcing the user in uncomfortable position
- Help user to create good habit through their own effort

Specification

- Calibrating body posture by standing against the wall
- Vibrate and notify when user hunch at a certain degree with a probability of 95%
- Product should be light and power efficient
- Battery powered, should last for 8 hour on average

Curvature Sensor Technology

- Resistive
- Inexpensive $8-15
- High power (30mA)
- Analog voltage output
- Manual calibration

- Capacitive
- Expensive $50
- Low power (300uA)
- Weather resistant
- Accurate low noise
- Reliable over time
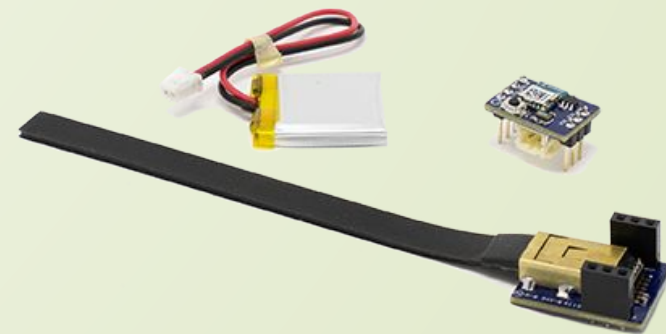
Block Diagram
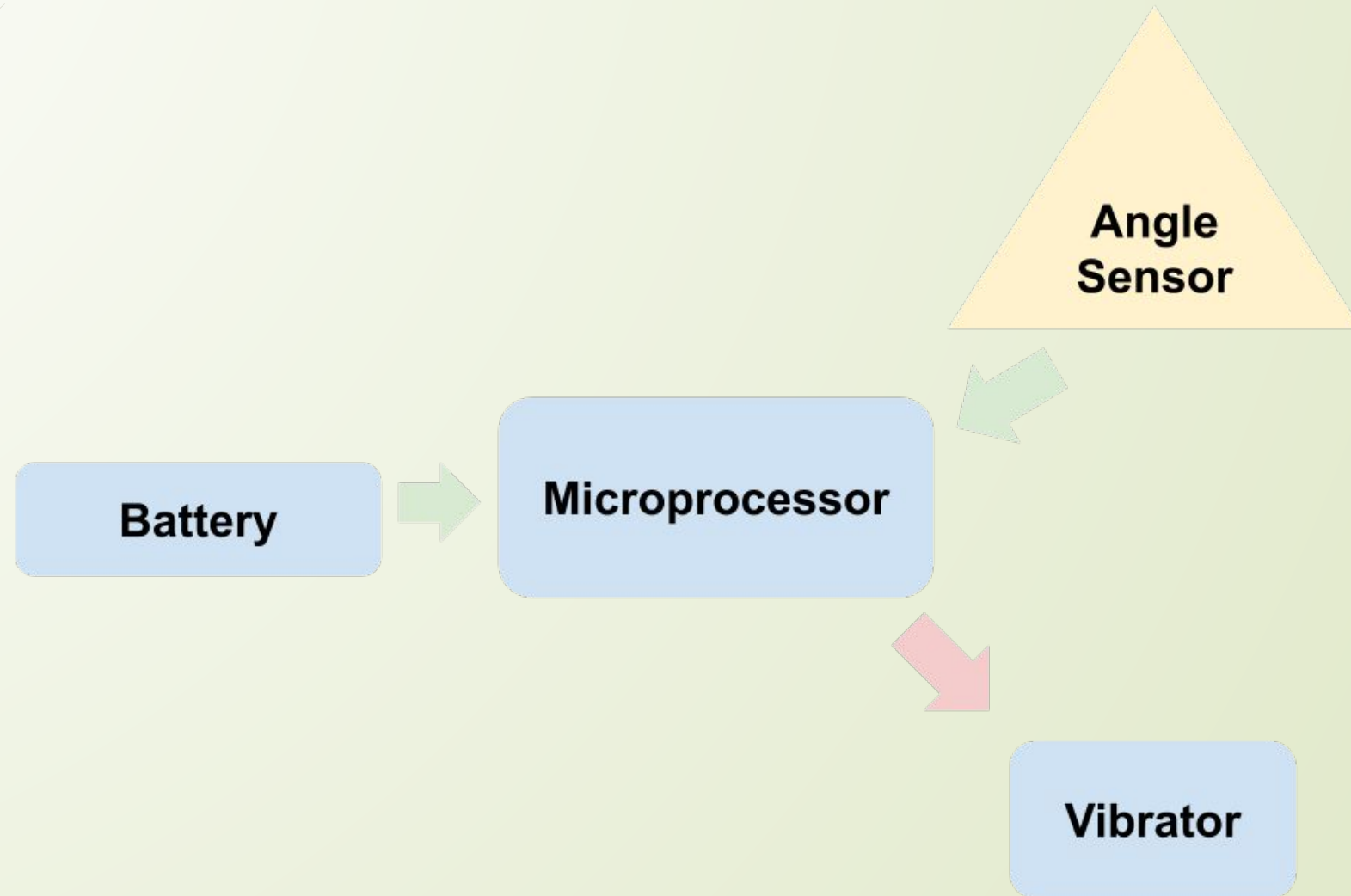
Potential Challenges

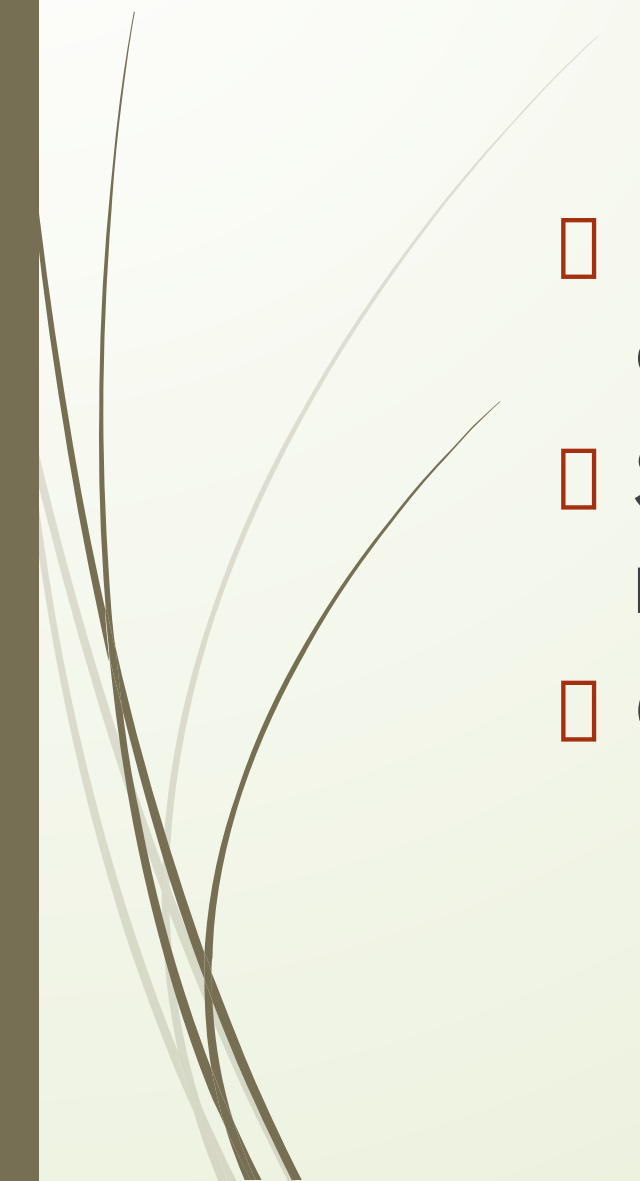| Comfort	Size	Durability
Reliability	Usability	Power Efficiency

Future Extensions

 Energy harvesting from user's movement or body heat

 Sensors on shoulder to prevent it from rounding

 Cloud

MDR Deliverables Schedule

- Get sensor data
- Vibration function normally
- Battery powered Microprocessor

Questions?