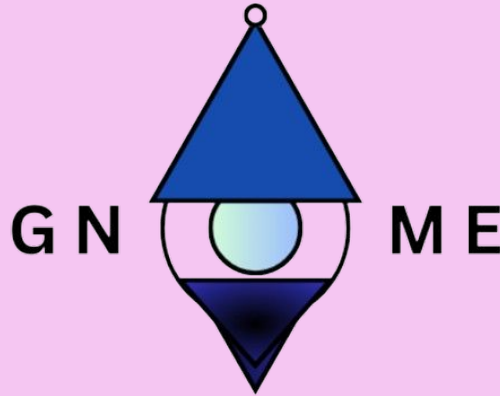


The MetroGnome



By Mir Jeffres, Jenny Gerber,
Joshua Hunter, Sarah Al Bastaki

Introduction: Project Background & Motivation

I Can Code!



I Can Sew!



I Can Music!



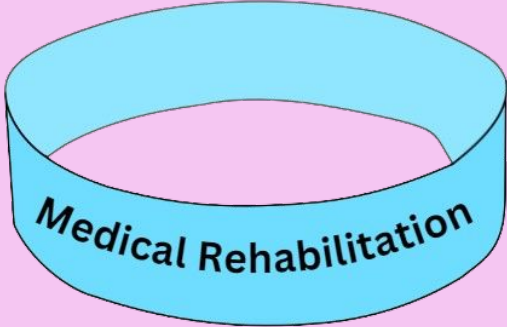
**I Can Menial
Labor!**



Introduction: Social Impact



Accessibility



Medical Rehabilitation



Group Music Programs

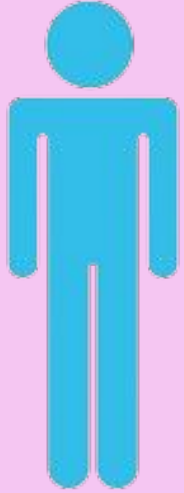


Promoting Mindfulness

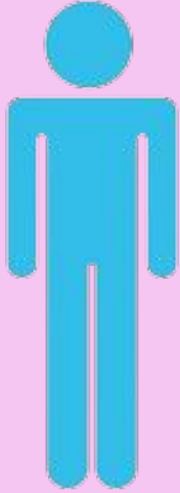


Running, Dance, Sports

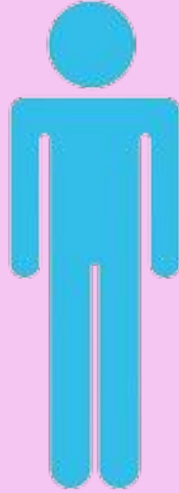
Expected Use Cases



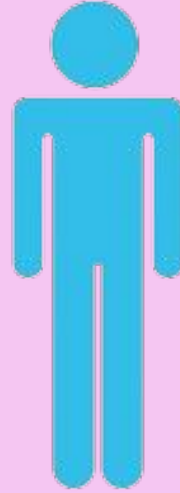
Individual
Music
Practice



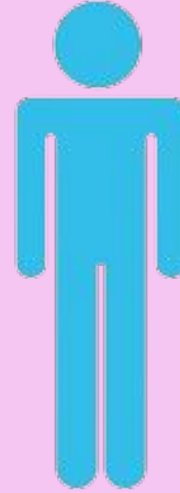
Group
Music
Practice



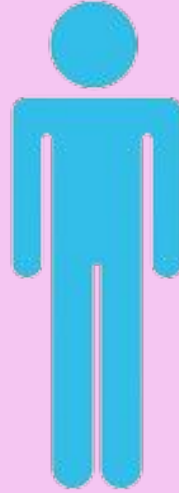
Sports
Training



Hearing
Impaired



Mindfulness/
Focus
Improvement



Medical
Rehabilitation

System Building Blocks: Unit Operations

Preset app inputs can be configured for easy adjustments or to be controlled by another user for practice purposes

Monitor Individual's Tap Tempo (TT) & App Inputs

Button Configurations:
On: Senses long press of 1 second
Off: Senses long press of 1 second
Tap: Senses time between continuous presses
Increase: Senses short press of less than 1 second
Decrease: Senses short press of less than 1 second

Outputs:
- Vibrational BPM
- Numbers lit in ascending order to represent the current BPM of the system

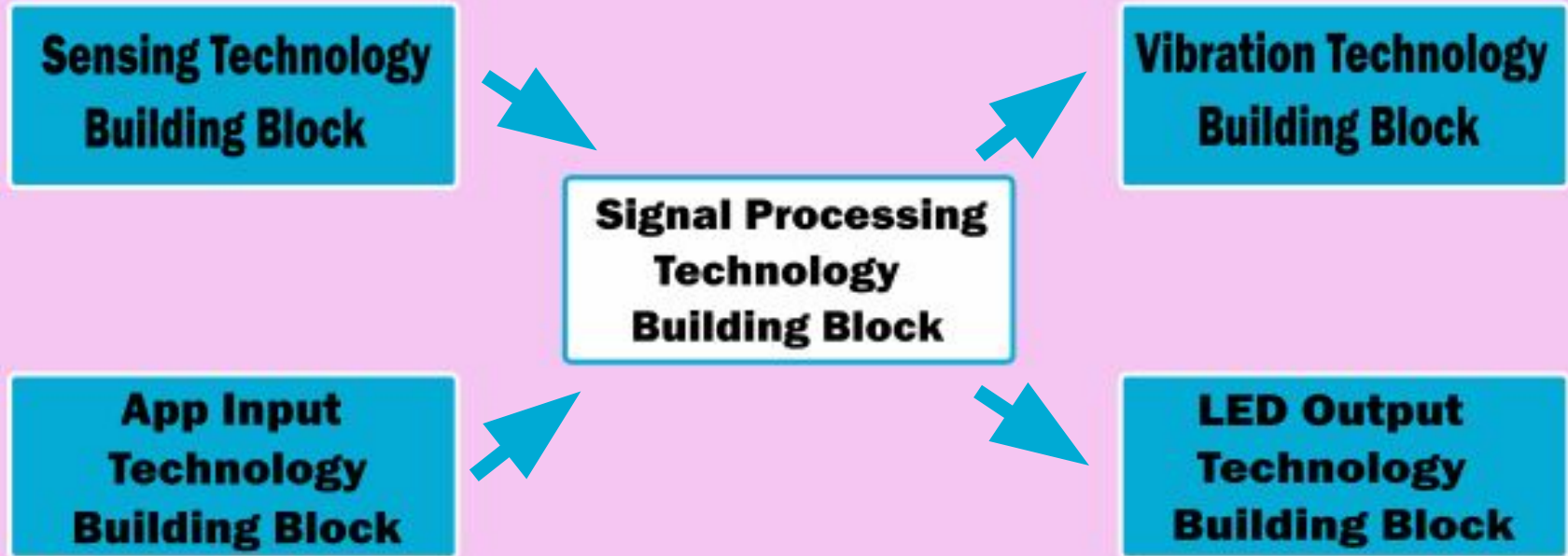
Reproduce TT as Vibrations & Light Up LEDs with Current BPM

MetroGnome System

Analyze Time in Between Pull Down Digital Signal

Converts the digital input of time between pull down signals into an analog signal for the system to process

System Building Blocks: Diagram of Building Blocks



System Specifications: Parameters Monitored

Pressure



Time



App Presets



System Specifications: Target Specifications



Rhythmic
Accuracy



Rechargeable
Battery



Adjustable BPM



Intuitive Controls



Compact &
Lightweight



Sweat Resistant



Compatible With Smart
Devices

Prototype Development: Comfort Component

Polyester Knit Fabric:

- Good flexibility and stretch
- Comfortable, users are used to wearing polyester on arms
- Capable of sweat adsorption

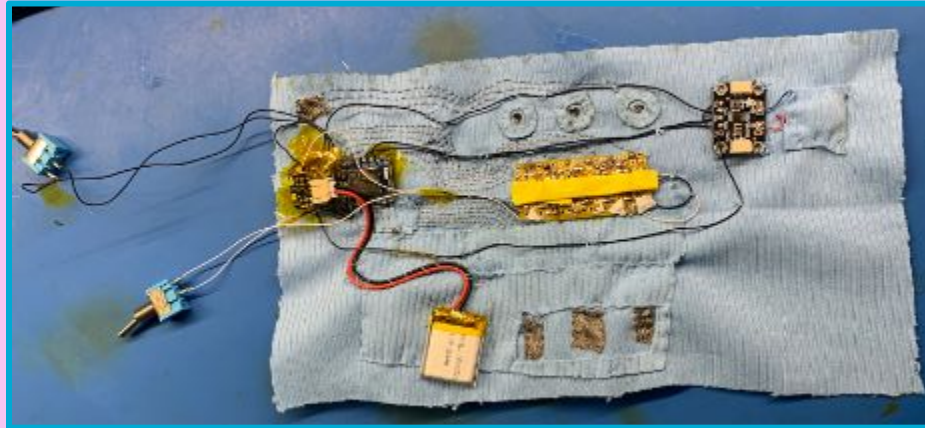
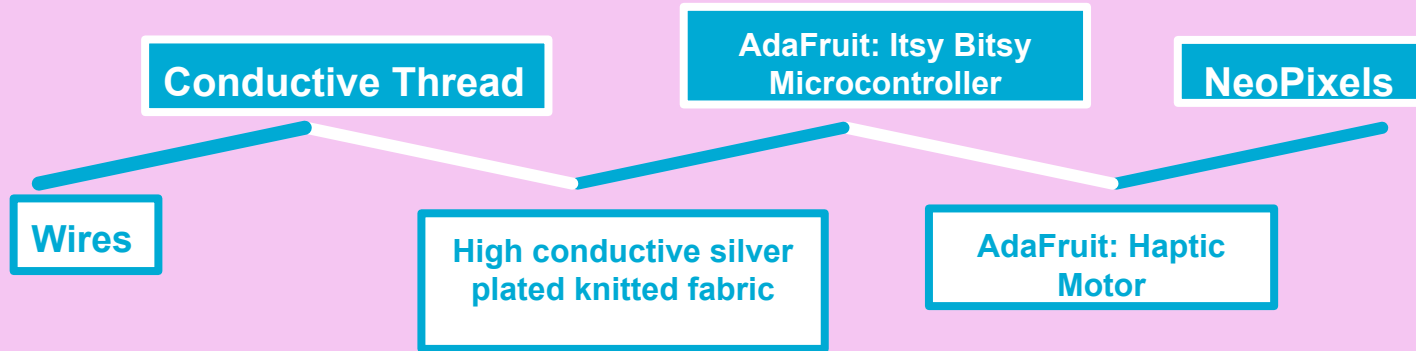


Prototype Development: Info Processing Component

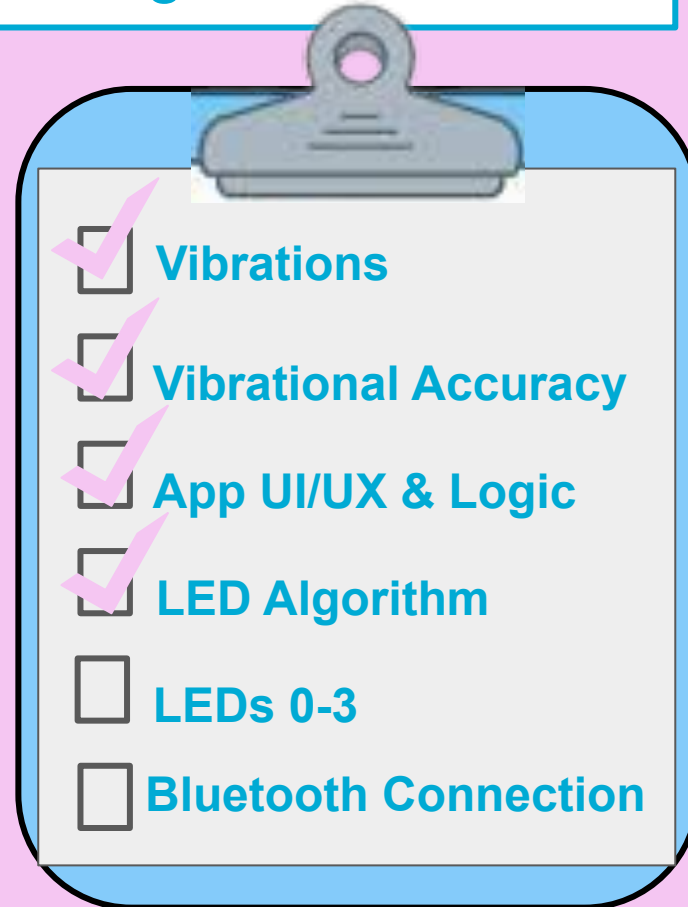


Circuit Python

Prototype Development: Hardware/Software Component



System Testing: Testing Method & Data



Learning

**I Learned
How to Build
an App!**



**I Learned
Circuit
Python!**



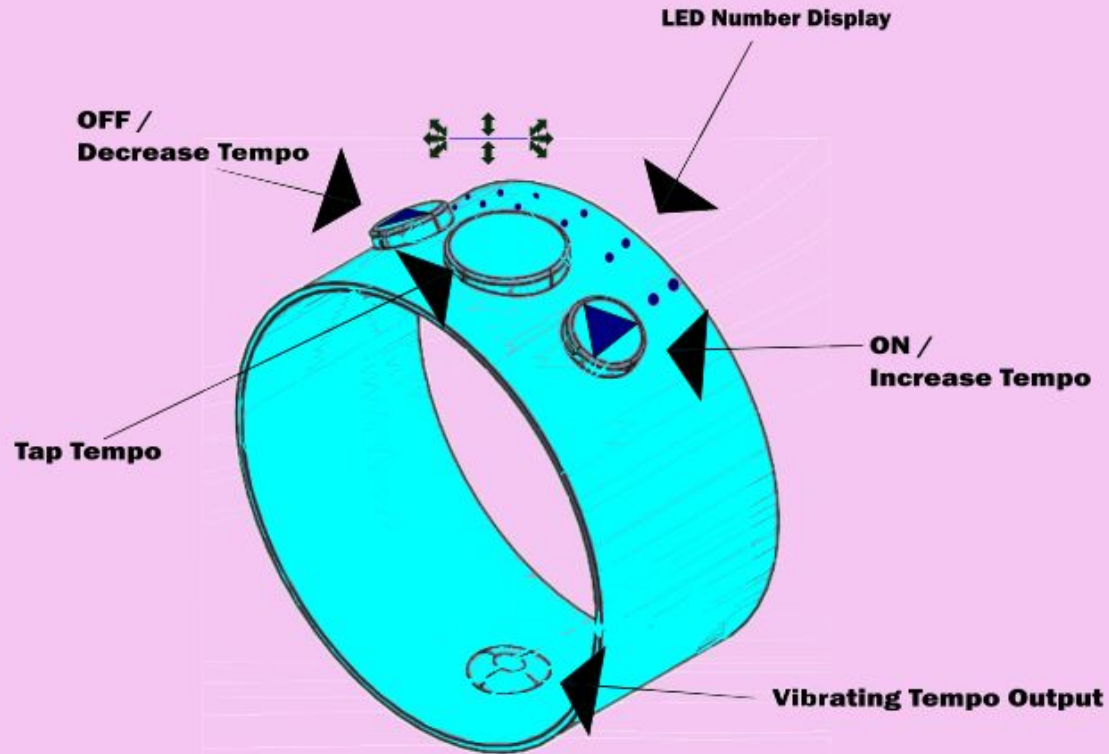
**I Learned
Laser
Cutting!**



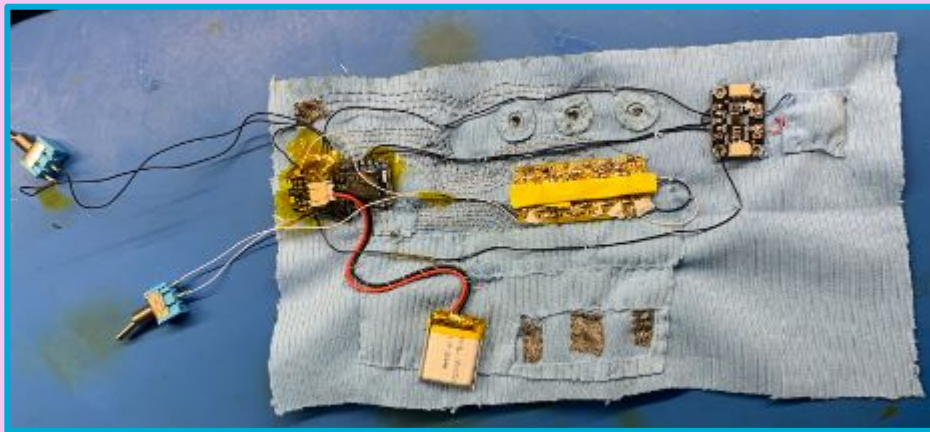
**I Learned
Circuits!**



Demonstration



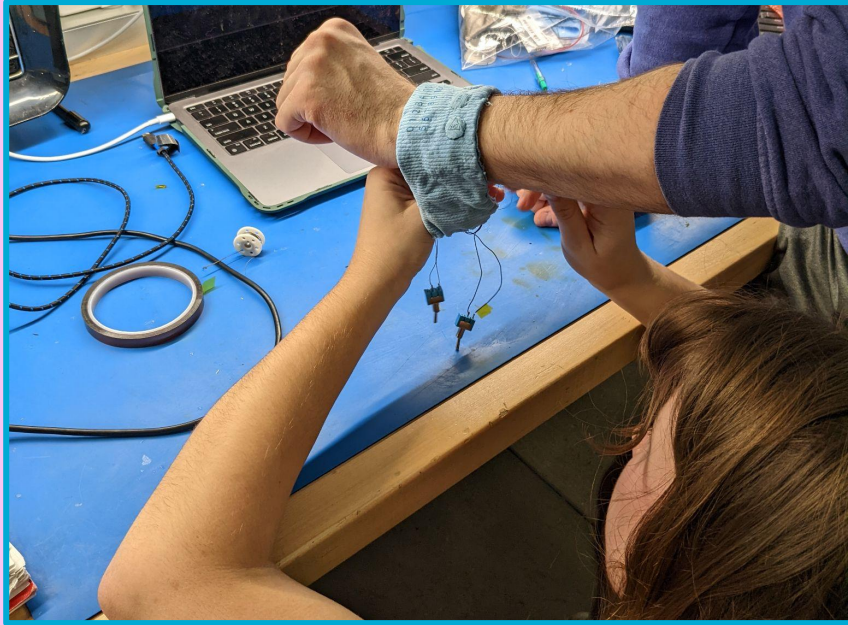
Progress Pictures



Progress Pictures



Progress Pictures



Instructions



To use the MetroGnome App, simply navigate to the Tap Tempo page and tap to the beat you want the BPM of. The app will accept three taps before resetting the calculation. Hit the SEND button once you have achieved your desired BPM. The MetroGnome device will start vibrating to that BPM and the MetroGnome's LEDs will light up to the corresponding number.



The MetroGnome device also has preset BPMs, at 60, 90, 120, and 150. Therefore, you can also select your desired BPM from the dropdown menu on and the device will vibrate that BPM on the MetroGnome. Enjoy!

Instructions

Tap Tempo

