

MBC

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LIBERTY
UNIVERSITY

The Team

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What is “MBC” (Music Bluetooth Controller)?

A **wearable** device that:

- **wirelessly flips pages** on an electronic reader via **Bluetooth**
- gathers data on **wrist tilt, wrist motion, audio pitch, and user humidity**: *give insight on performance habits*

A Demo! Page 1:

1963

For my friends, Webb and Gale Coffee

Three Preludes

for Unaccompanied Flute

Flute

Allegro *spirited, well-accented*

1

Robert Muczynski, Op. 18

tense. agitated

feh! huk
hard hit
HUNS

lighter

Fall '16

uppt

of sly f

6 8

noth Bb

drop saw T

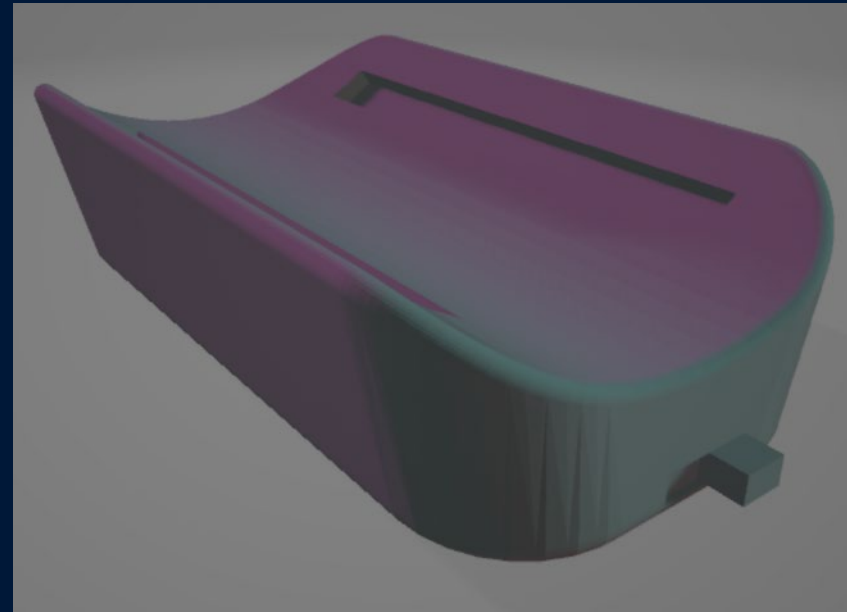
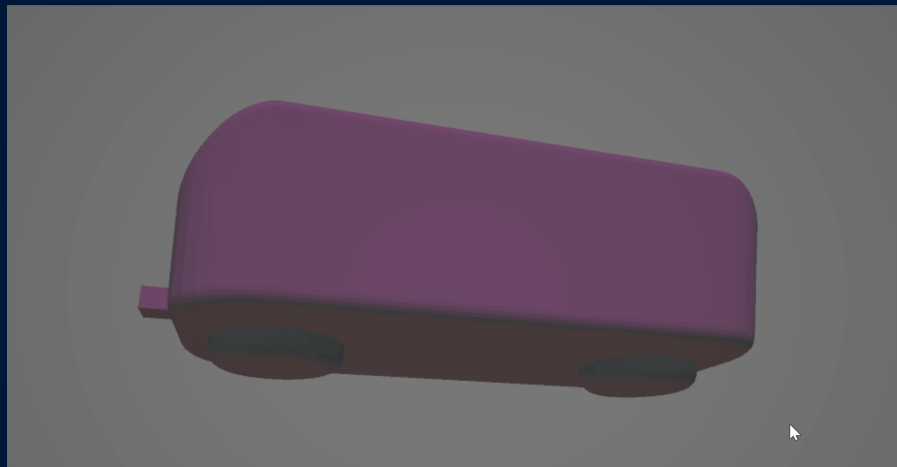
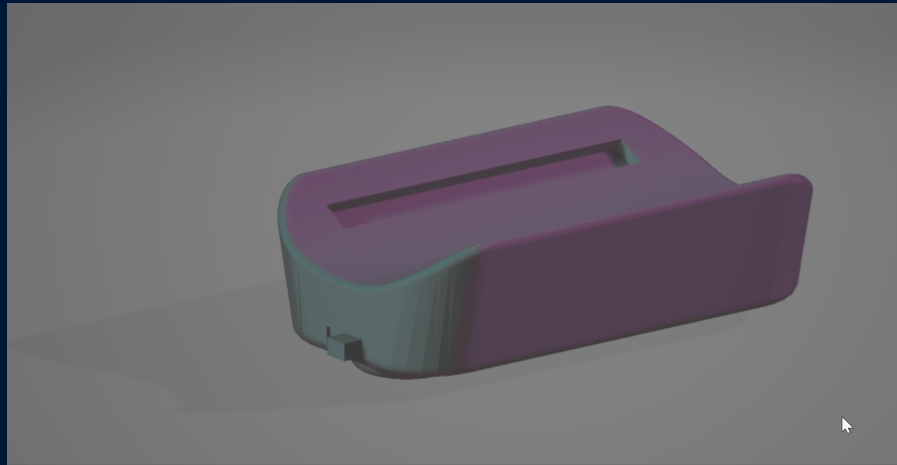
mf *dim.* *p* *f*

A Demo! Page 2:

The image displays a handwritten musical score for a piano piece, page 2. The score is written on two staves in treble clef. The first staff begins with a treble clef, a key signature of one sharp (F#), and a 9/8 time signature. The music is marked with various dynamics: *f* (forte), *mf* (mezzo-forte), *dim.* (diminuendo), *p* (piano), and *f* (forte). Performance markings include "drop $\frac{1}{2}$ au T" and "(short)". A blue star is placed above the final measure of the first staff. The second staff starts with a 3/8 time signature and includes a triplet of eighth notes marked with a "3" and a dynamic of *p* (piano). The piece concludes with a final measure marked with a dynamic of *f* (forte). The score is annotated with red and blue ink. A red circle with a checkmark is drawn around the first measure. Blue circles highlight specific notes and rests. Blue arrows point to various parts of the score, and blue "T" markings are placed above several notes. A blue star is positioned above the final measure of the first staff.

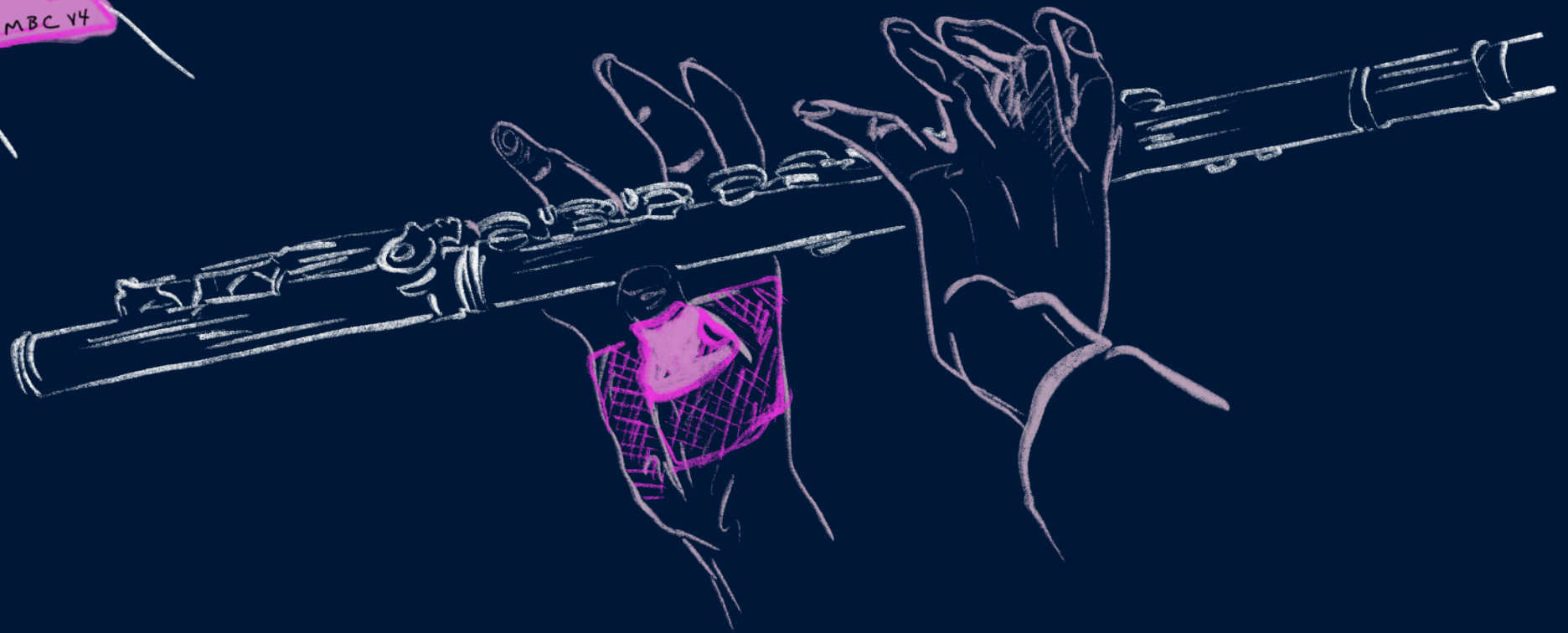
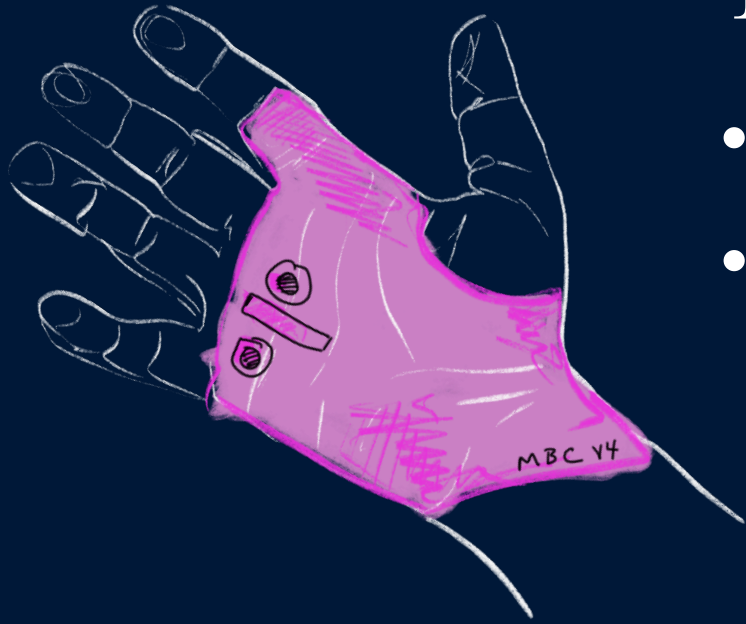


Initial Design



Projected Design

- User Oriented
- Ring-Glove *hybrid*



Iteration One: Stitches and Electrical Tape

Forward/Backward
Buttons on opposite
sides of palm

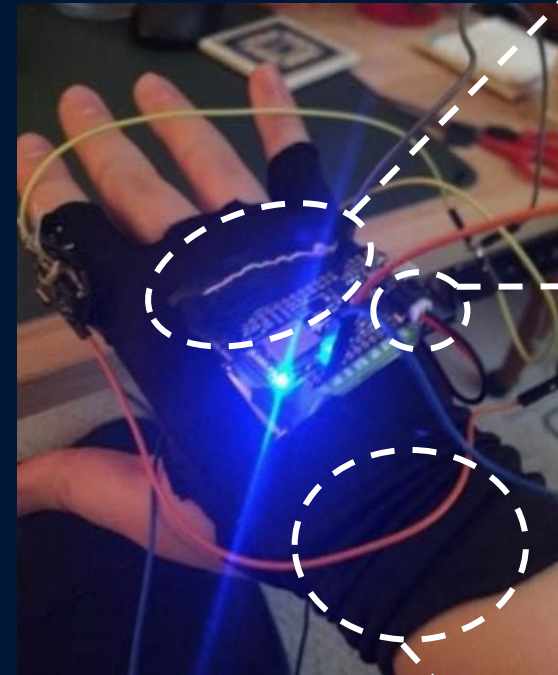


Basic Push Button



Embroidery thread and
stitching

Stitching a piece of cardboard from
a hummus box onto back of hand



Manual
Plug/unplug
of the LiPoly
battery

No utilization of wrist
real estate

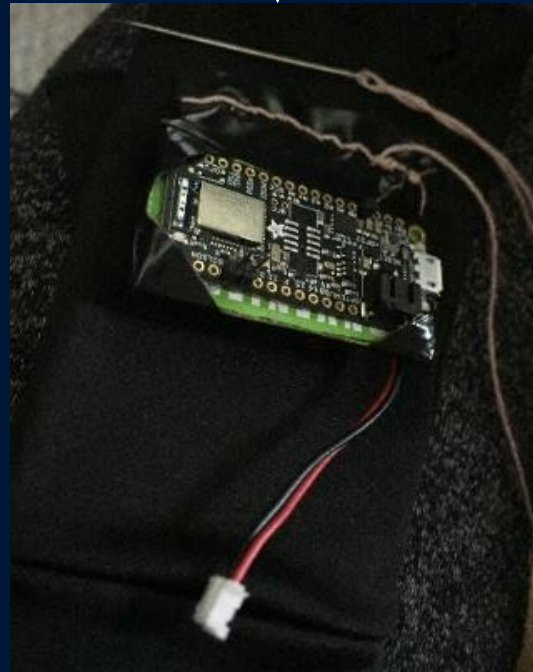
Initial Frenzy of Production

Testing with a breadboard and metronome application

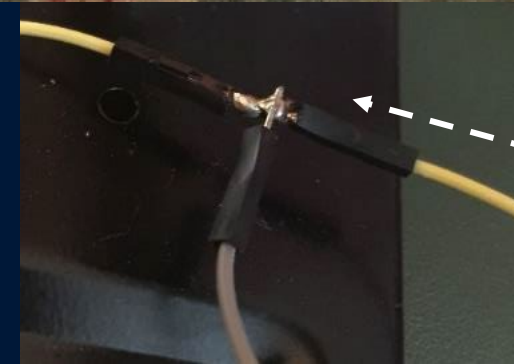


Novice move: stitch electrical tape with an embroidery needle

Posing with the now-gummy (from repeatedly puncturing electrical tape) needle



Loads of sensors purchased from Adafruit!



Wonderful (questionable) soldering!

Iteration Two: Custom Glove Base



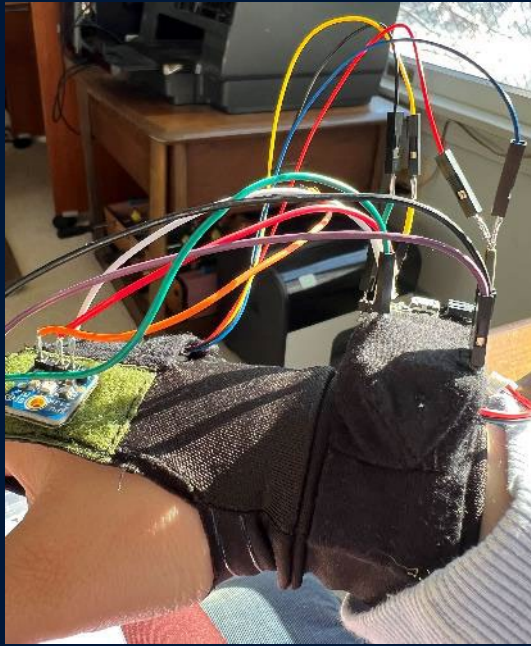
Iteration Two: Meticulous Measurements



Produced by K. Best



Iteration Two: Final Assembly



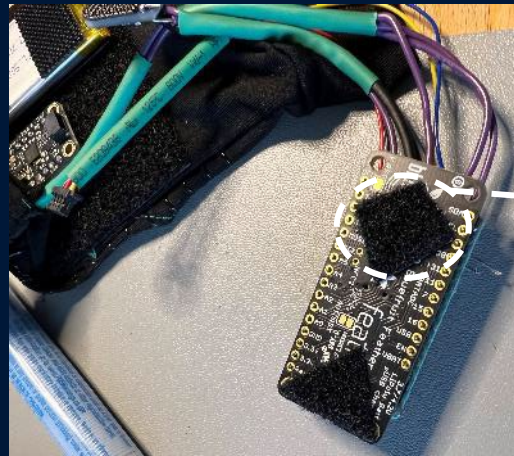
Featuring:

- Isolated Velcro Patch
- Wrist band with Velcro strip and chip/battery housing
- Integration of microphone, IMU, and button location

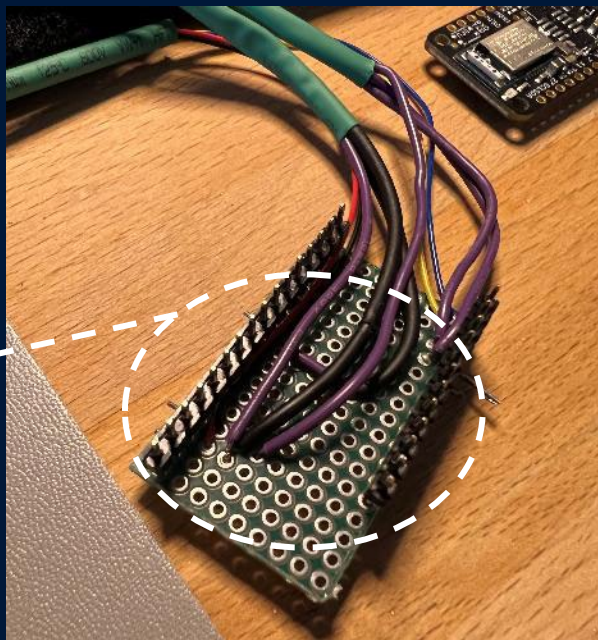
Iteration Three: Final Assembly



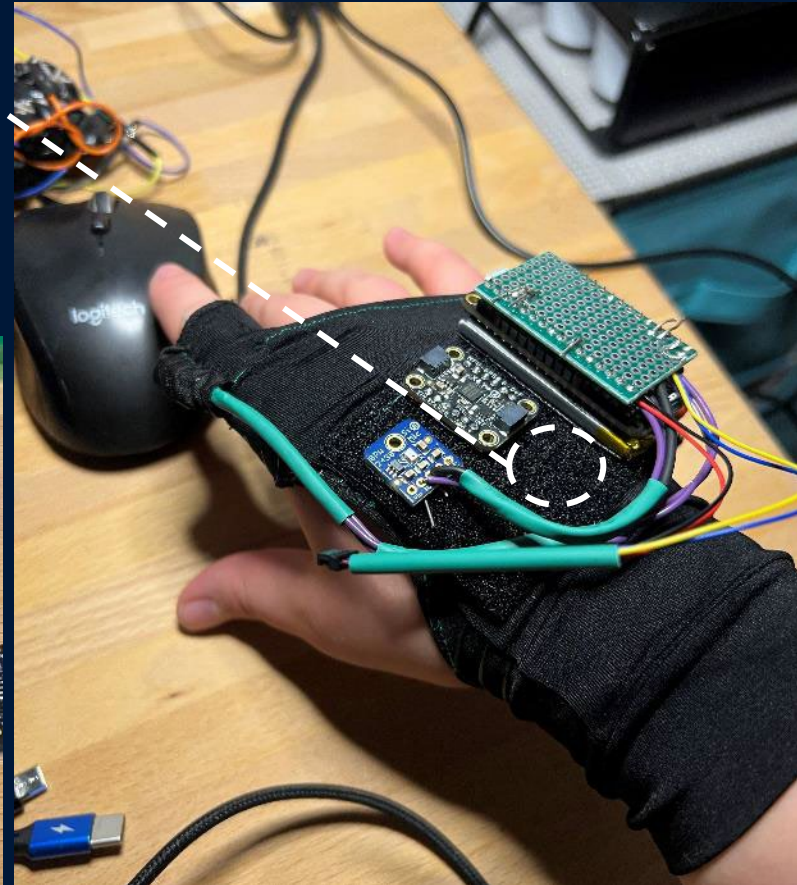
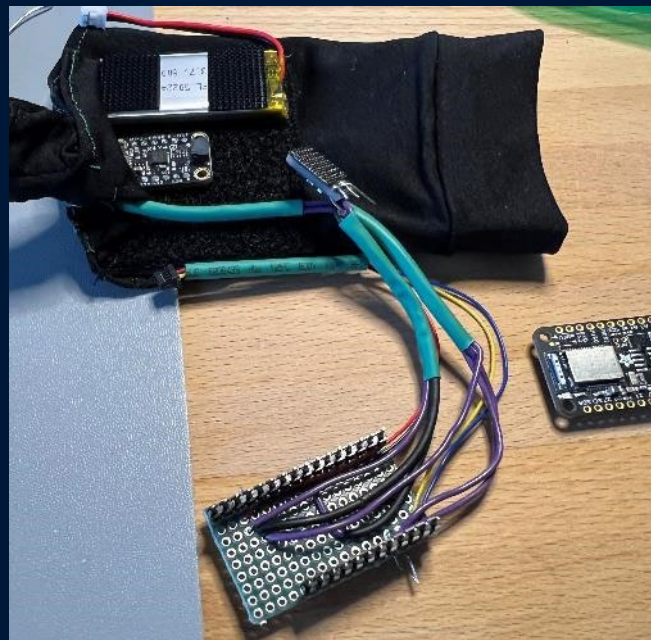
More sewing



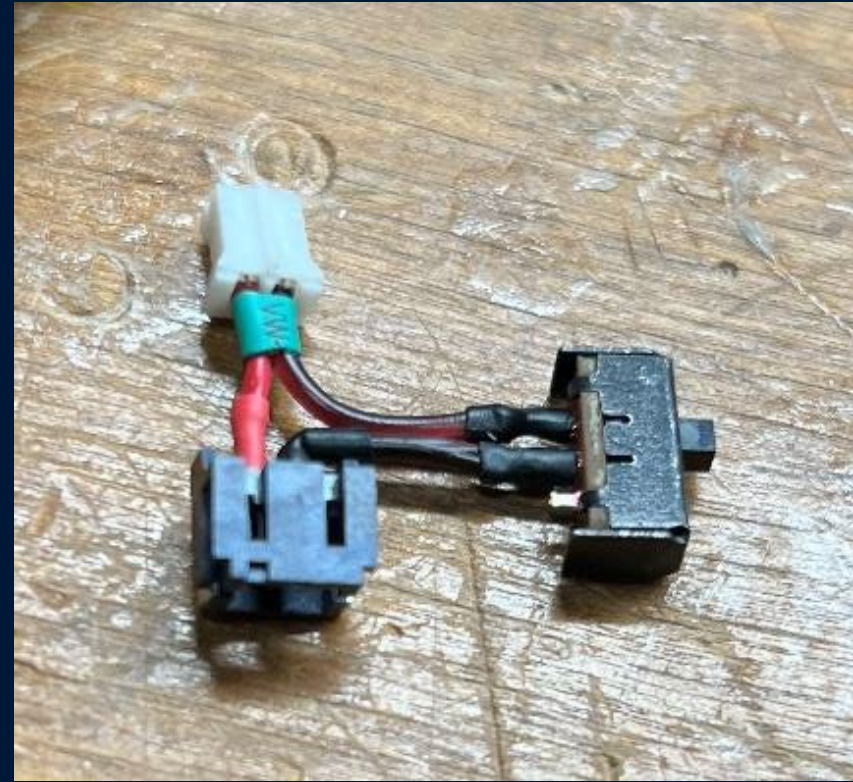
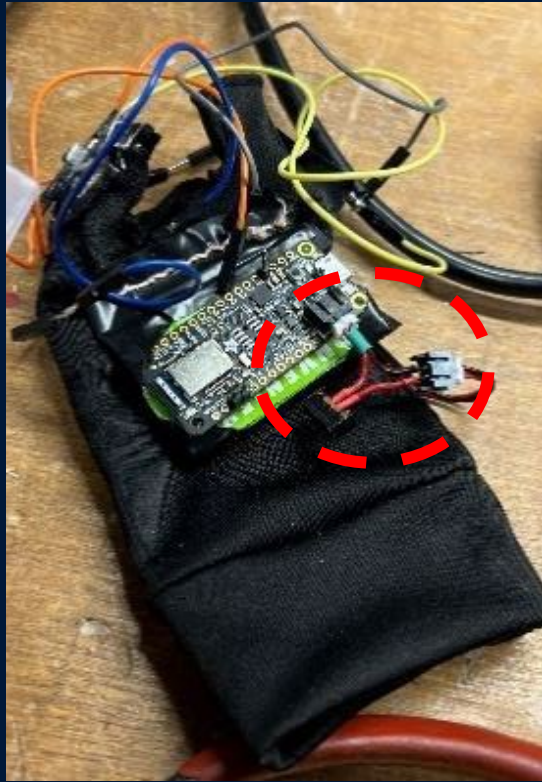
Hook and loop patches for adjustability



Arduino backboard with hidden wire routing



Iteration Three: Final Additions



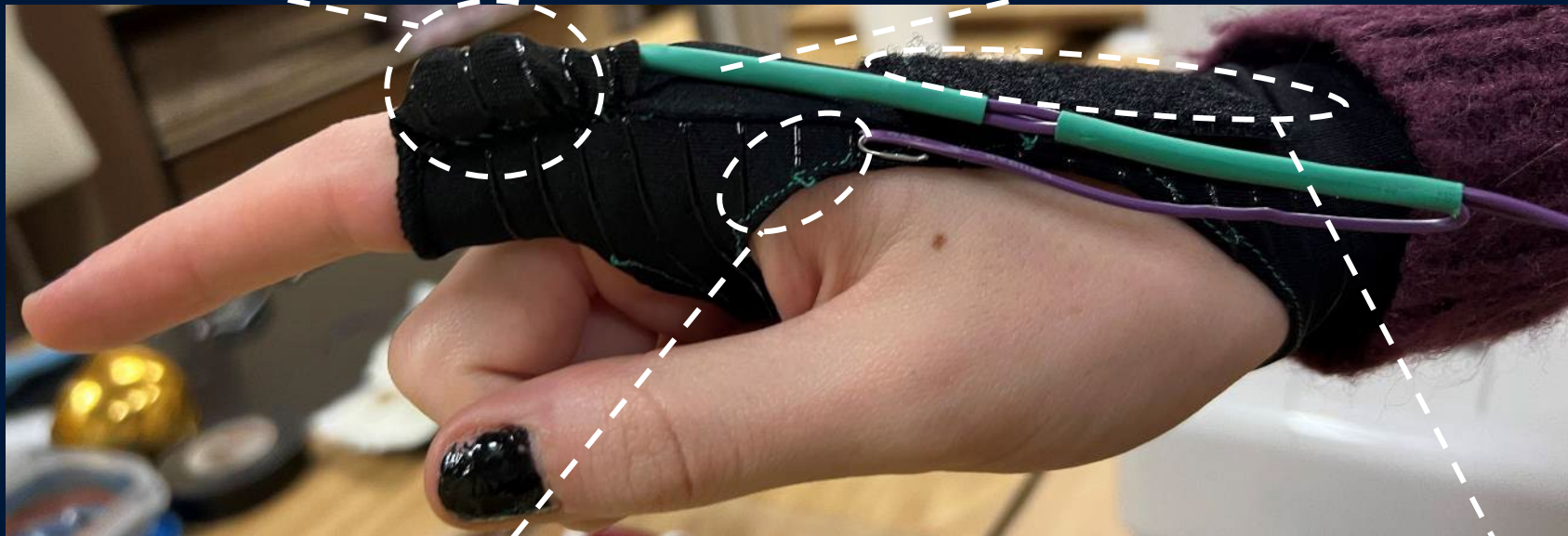
Three Completed Prototypes



Latest Iteration

Both buttons housed on same finger; covered in glove material

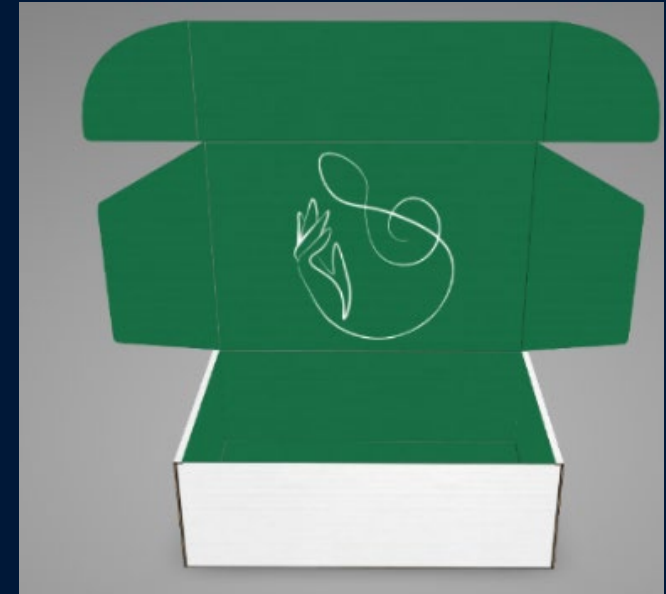
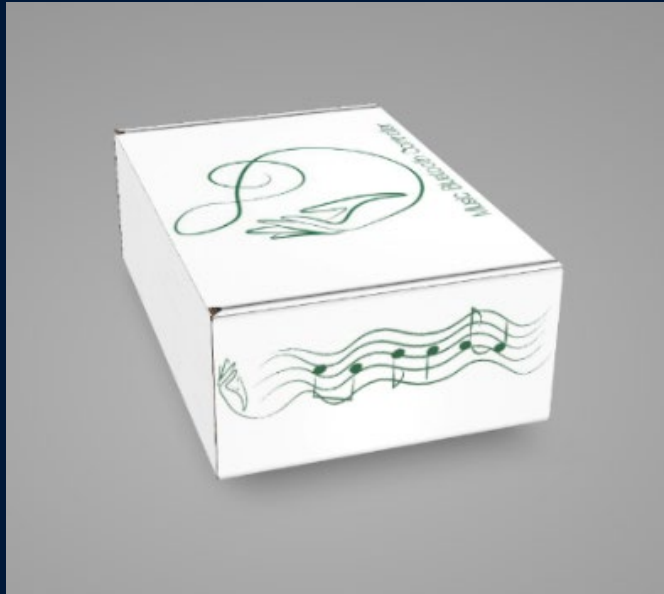
Wires wrapped in heat shrink tubing for organization



Teal-Blue Accents

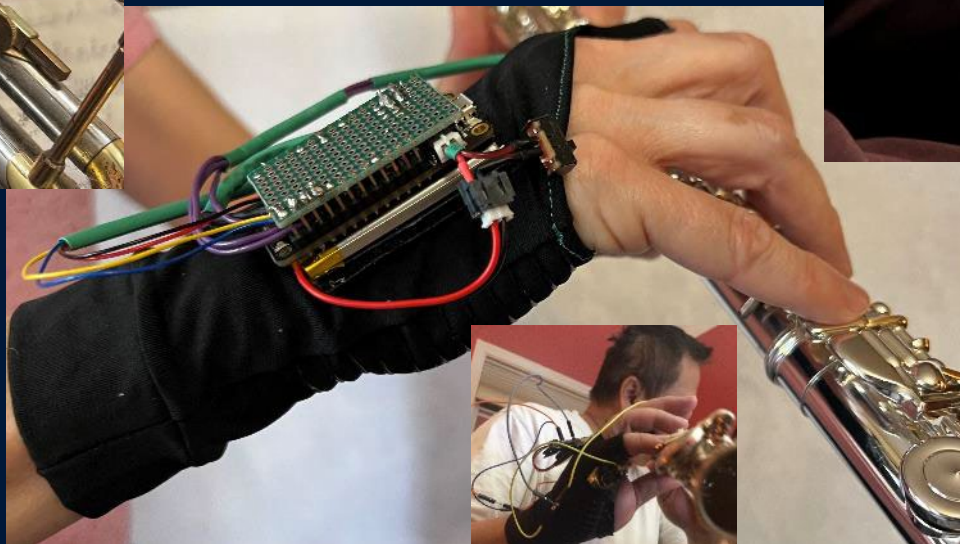
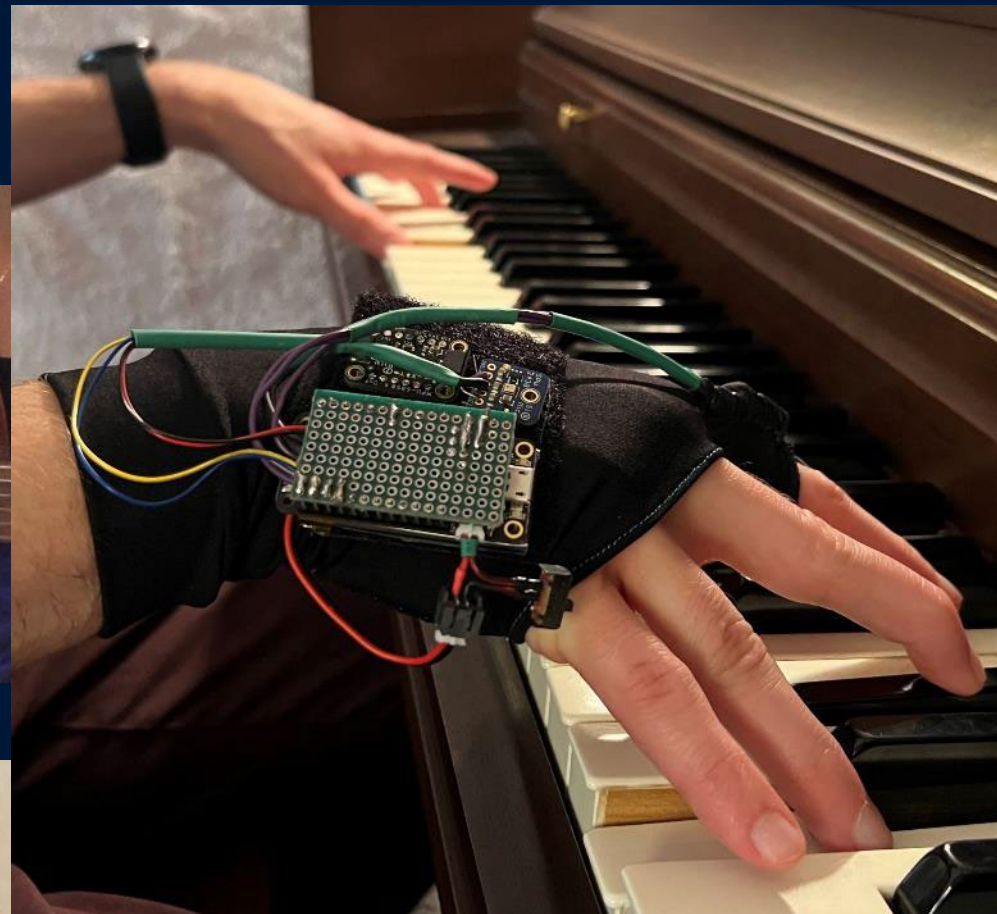
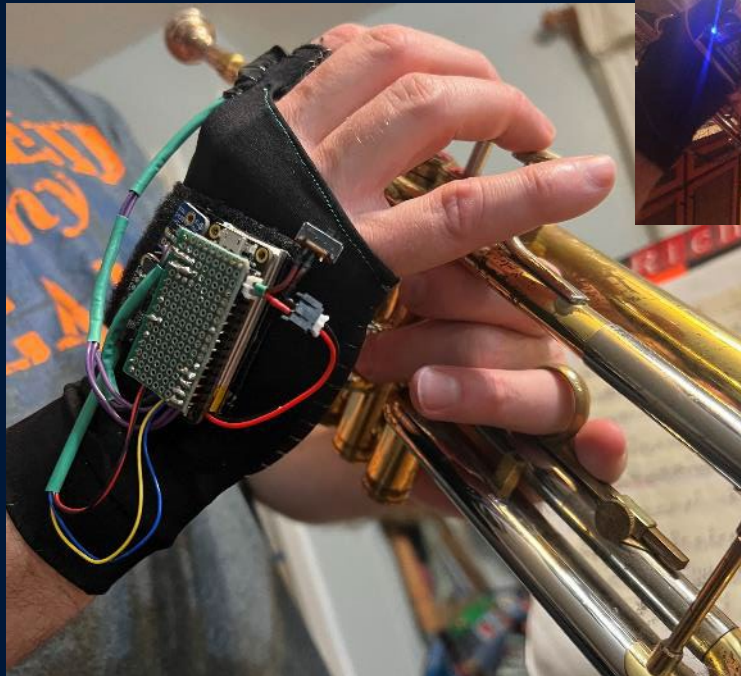
Larger, Modular Velcro Pad

Packaging



Designed by K. Weinzapfel

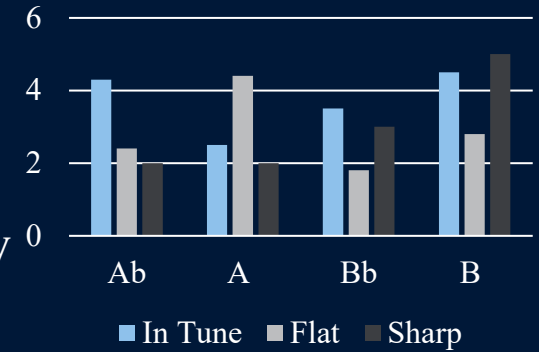
MBC Demos



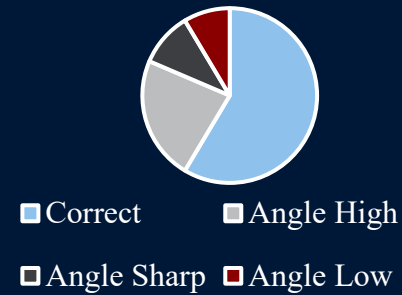
Future Vision: Data Analytics



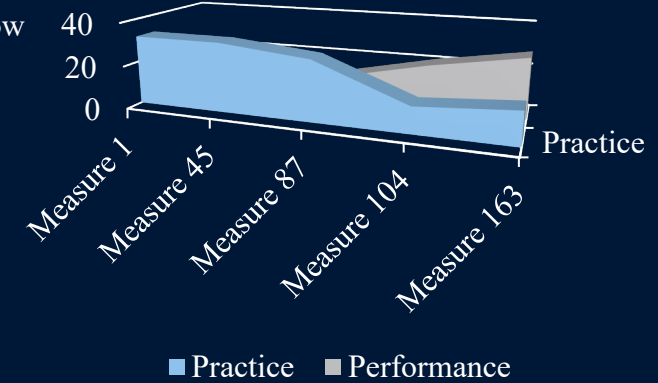
Practice Pitch Report



Tilt Accountability



Sweat/Shaking Measurements over Time



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