

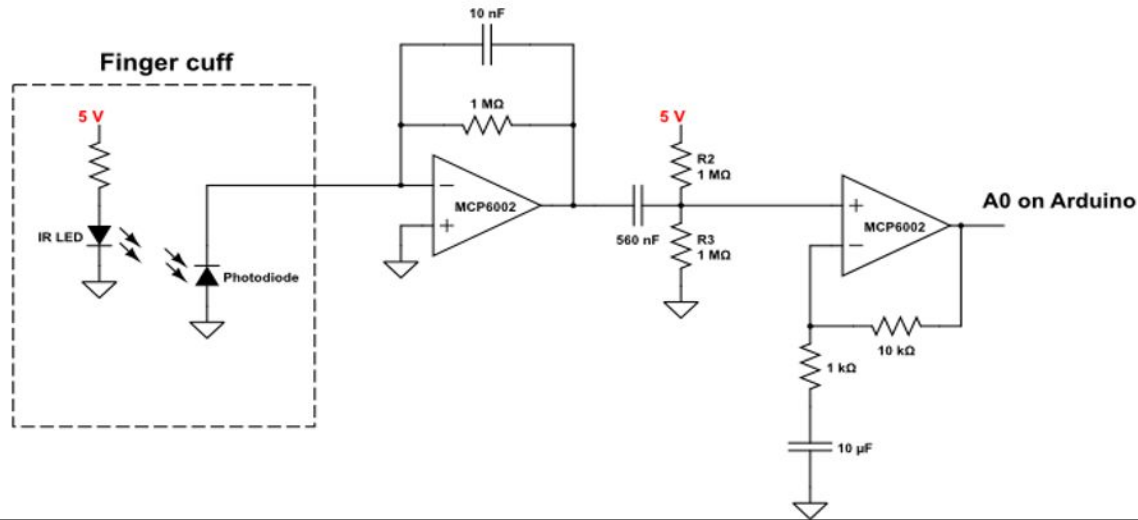


Initial Design Presentation



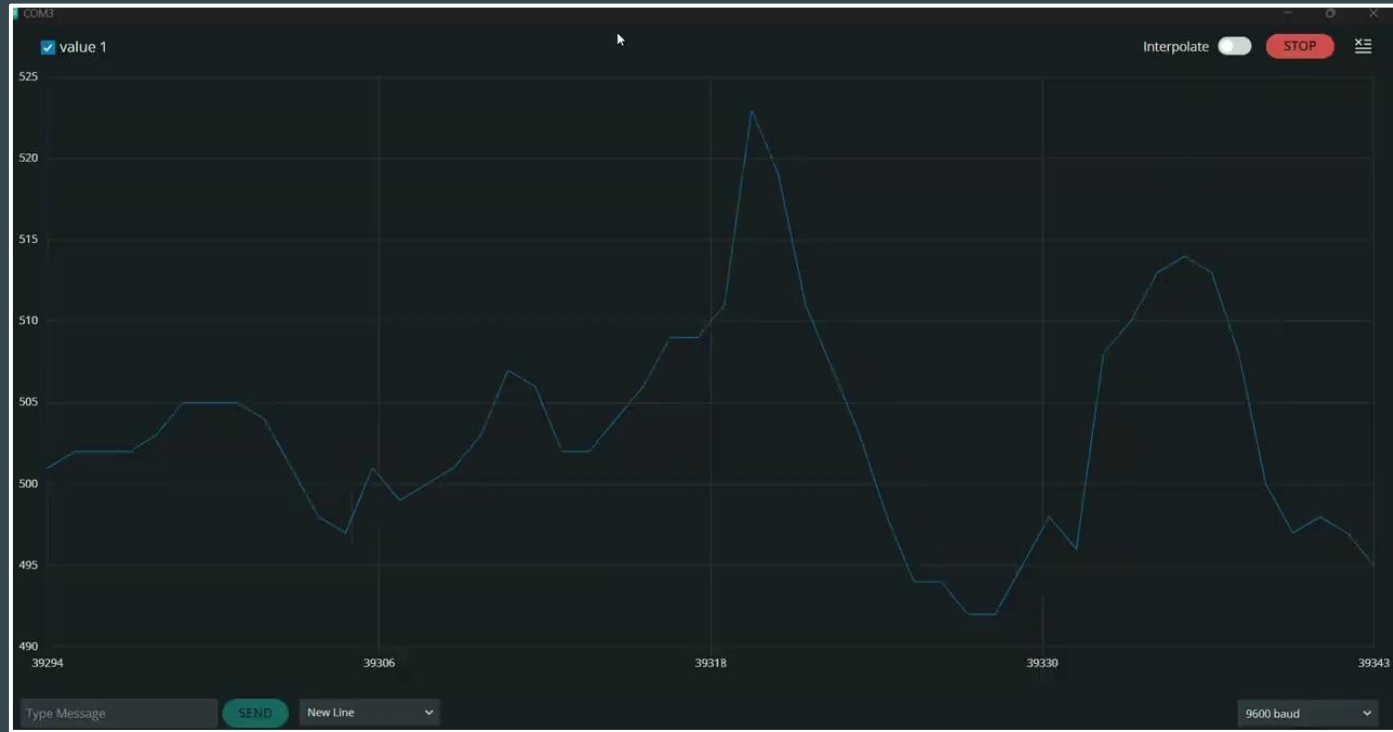
CROI Technologies | Conor Dunne & James Hadley, Jr.

Electrical - Initial Circuit

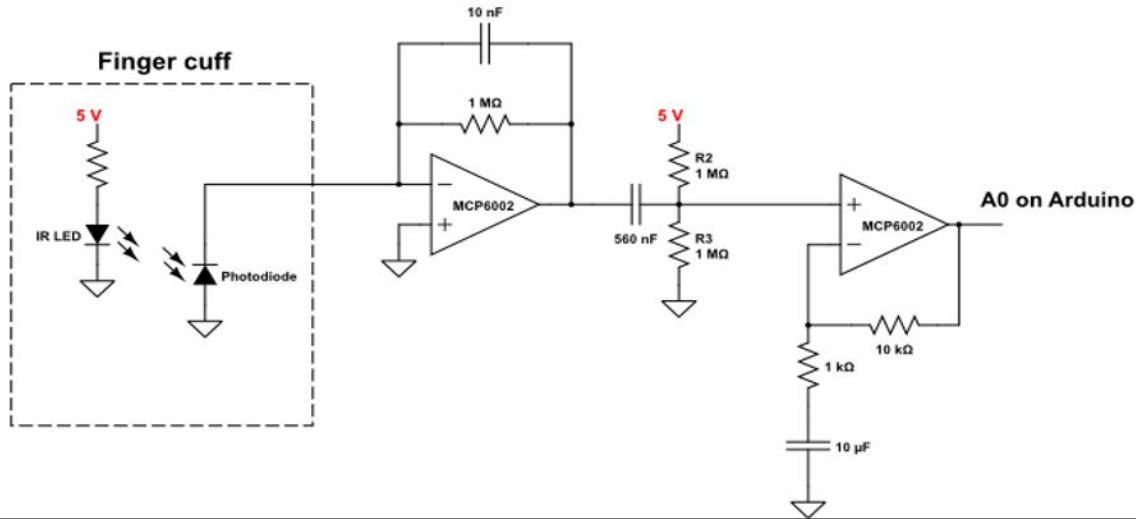


- IR LED and photodiode
- TIA amplifier (current → voltage with noise reduction)
- high-pass filter (cutoff frequency 0.57 Hz)
- Non-inverting amplifier (gain = 10)

Electrical - Initial Circuit Video

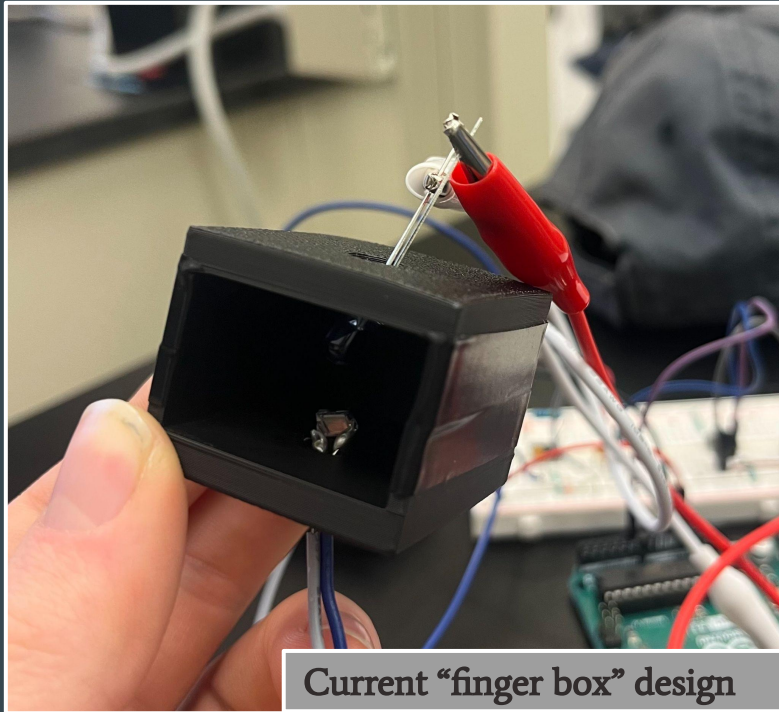


Electrical - Adjusted Circuit



- Signal far too low (within ~4 digital counts)
- Signal to noise decent
- Increase non-inverting gain
 - Higher feedback resistor
 - Second op-amp
- Brighter LED
- Background subtraction

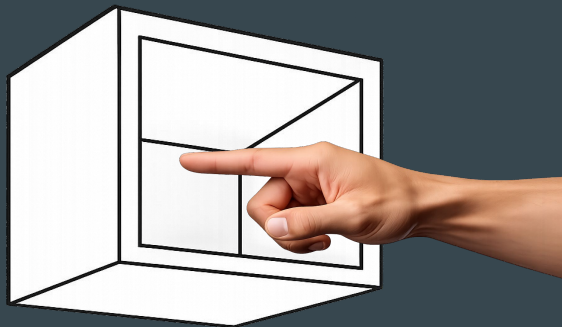
Design - Mechanical Improvements



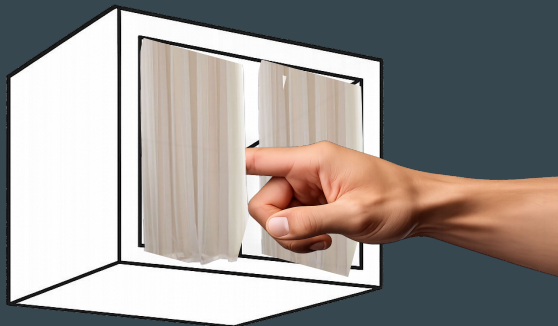
Current "finger box" design

- Sink photodiode into casing for more stability
- Design casing so photodiode and LED are flush with the skin
- Ergonomic design

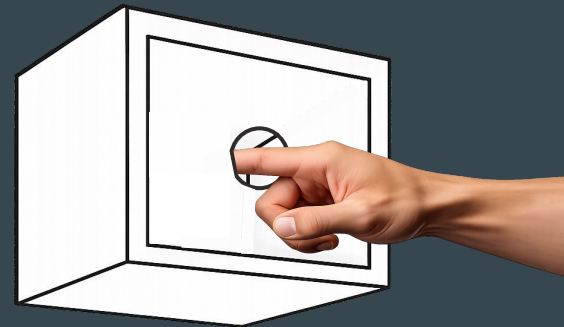
Design - Ambient Light Isolation



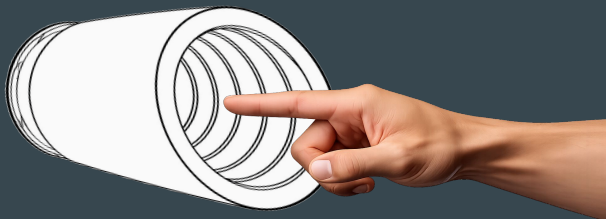
Current



Mesh



Enclosed



Optical Baffle



Clip

Market - Competitors

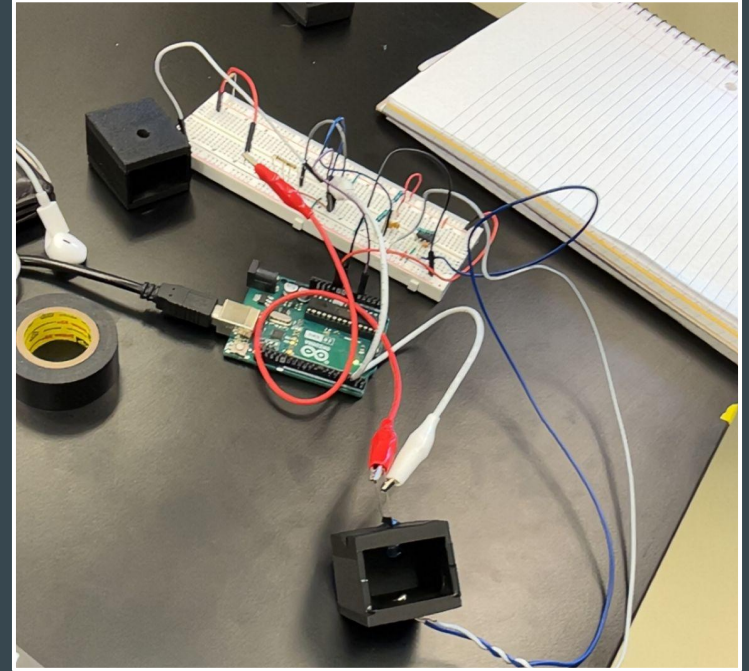
Apple	Watches - heart rate, ECG, blood oxygen (SpO2), sleep tracking, and fall detection	\$249 - \$799
Samsung	Watches - heart rate, sleep, blood oxygen (SpO2), stress, and fitness	\$179 - \$649
Fitbit	Watches - heart rate, sleep, stress, and blood oxygen (SpO2)	\$65 - \$250
Masimo	Pulse Oximeter - heart rate and blood oxygen (SpO2)	\$280 - \$500
Medtronic	Pulse Oximeter - heart rate and blood oxygen (SpO2)	\$95 - \$700
Wellue	Pulse Oximeter - heart rate and blood oxygen (SpO2)	\$20 - \$230

AVG: \$148 - \$522

Market - Price Analysis

Component	Quantity	Total Price
IR LED	1	\$0.90
Photodiode	1	\$1.40
Resistors	5	\$0.25
Capacitors	3	\$0.21
Op-Amps	2	\$0.64
Microcontroller	1	\$5 - \$15
Mini-LCD	1	\$5

Total: \$13.40 - \$23.40



Thank you

