**Glove Project v1: start of the project**

**Cost:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Products: | Estimated amount: | Amount: | Proposed Cost: | Actual Cost: | Necessary: | Link: |
| Short flex Sensor (77.57mm) | 5 | 3 | $92.50 | $65.85 | \* | [--------](https://core-electronics.com.au/short-flex-bend-sensor.html) |
| Pi Juice zero | 1 | 1 | $73.50 | $73.00 | \* | [--------](https://core-electronics.com.au/pijuice-zero-a-portable-power-platform-for-raspberry-pi-zero.html?gclid=Cj0KCQjw-fmZBhDtARIsAH6H8qjEWl0LST-vwiGtN2aUMwE1ZS1V9YsaYSDHLTRANvu3e4YleCzblOsaAlIjEALw_wcB) |
| 3-pin LiPo battery for PiJuice zero 1000mAh | 1 | 1 | $7.65 | $7.65 | \* | [--------](https://core-electronics.com.au/adafruit-lsm6dsox-6-dof-accelerometer-and-gyroscope-stemma-qt-qwiic.html) |
| Adafruit LSM6DSOX 6 DoF Accelerometer and Gyroscope | 1 | 1 | $26.20 | $26.20 | \* | [--------](https://core-electronics.com.au/adafruit-lsm6dsox-6-dof-accelerometer-and-gyroscope-stemma-qt-qwiic.html) |
| Jumper wire m/m | 1 | 1 | $2.30 | $2.30 | \* | [--------](https://core-electronics.com.au/jumper-wire-20cm-ribbon-of-40pcs.html) |
| Jumper wire f/m | 1 | 1 | $3.59 | $3.59 | \* | [--------](https://core-electronics.com.au/male-female-jumper-wire-40-20cm.html) |
| Jumper wire f/f | 1 | 1 | $3.30 | $3.30 | \* | [--------](https://core-electronics.com.au/solderless-breadboard-jumper-cable-wires-female-female-40-pieces.html) |
| small aluminium case | 1 | 0 | $50.00 | $00.00 |  | [--------](https://www.jaycar.com.au/small-aluminium-case-with-foam-insert-camera-video-case/p/HB6355?gclid=CjwKCAjwwL6aBhBlEiwADycBIHe_wEXa2EsnQoKugtPfU0FgiGgv5Wf9Wlb5dKUGbwjzuCr1A4_rtxoCeBIQAvD_BwE) |
| Raspberry Pi Zero Wireless kit | 1 | 1 | $89.00 | $89.00 | \* | [--------](https://core-electronics.com.au/raspberry-pi-zero-w-starter-kit.html) |
| toolpro metal caliper | 1 | 0 | $23.00 | $00.00 |  | [--------](https://www.supercheapauto.com.au/p/toolpro-toolpro-caliper-vernier---metal-150mm/284469.html?gclid=Cj0KCQjw48OaBhDWARIsAMd966CrTgO6dNtLv2VN9SQQrEmIVxJ-Du7gOWQTeqmHF0ISCyhgwIkoPE0aAq3_EALw_wcB&gclsrc=aw.ds) |
|  |  |  |  |  |  |  |
| Total: | 10 | 10 | $181.60 | $185.60 |  |  |

**Change log:**

Glove Project v1: start of the project

Mircocontroller: Raspberry Pi Zero Wireless

sensors:

- FlexSensors x 3

-

battery:3-pin Li-Po battery for PiJuice zero 1000mAh

gloves used: Leather Gloves

connections:

- Jumper Wires

- Bread board

other:

-

issues:

- Connections unstable and easy to break

- hard to read data

- non-moveable

- un-able to access flex sensor data due to no ADC pins

- un-able to access gyroscopic and accelerometer sensors

- electronics vunerable to the elements

- electronics vunerable to breakage

- un-able to convert data to verbal form of communcation

- un-able to recongize Force Sensitive Sensors

**Glove Project v2: Microcontroller Change + Soldering Tests**

**Costs:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Products: | Estimated amount: | Amount: | Proposed Cost: | Actual Cost: | Necessary: | Link: |
| Pimoroni Pico Lipo | 1 | 1 | $26.45 | $26.45 | \* | [--------](file:///C:\Users\Lucas%20Newman\Documents\2023\Term%202\PIP\Projects\Glove%20Project\|%20https:\core-electronics.com.au\pimoroni-pico-lipo.html) |
| JST-PH 2-pin connector battery | 1 | 1 | $15.35 | $15.35 | \* | [--------](https://core-electronics.com.au/polymer-lithium-ion-battery-1000mah-38458.html) |
| Resistor Pack 2000 pieces | 1 | 1 | $21.70 | $21.70 | \* | [--------](file:///C:\Users\Lucas%20Newman\Documents\2023\Term%202\PIP\Projects\Glove%20Project\|%20https:\core-electronics.com.au\1-4w-resistor-pack-2000-pcs.html) |
| Flux Pen | 1 | 1 | $15.10 | $15.10 | \* | [--------](https://core-electronics.com.au/circuitworks-no-clean-flux-dispensing-pen.html) |
|  |  |  |  |  |  |  |
| Total: | 10 | 10 | $78.60 | $78.60 |  |  |

**Change log:**

Microcontroller: Pimoroni Pico Li-Po

sensors:

- FlexSensors x 3

-

battery: 2-pin JST-PH connection battery 3.7V 1100mAh

gloves used: Leather gloves

connections:

- Jumper Wires

- Bread board

- Solder

- soldering Pins

other:

-

fixed previous issues:

- un-able to access flex sensor data due to no ADC pins

- non-moveable

issues:

- Connections unstable and easy to break

- hard to read data

- un-able to transfer data wirelessly

- restricted movement

- un-able to access all flex sensor data due to 3 ADC pins

- electronics vulnerable to the elements

- electronics vulnerable to breakage

- un-able to access gyroscopic and accelerometer sensors

- un-able to convert data to verbal form of communication

- un-able to recognize Force Sensitive Sensors

**Glove Project v3: Microcontroller Change + Soldering Tests**

**Costs:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Products: | Estimated amount: | Amount: | Proposed Cost: | Actual Cost: | Necessary: | Link: |
| Short flex Sensor (77.57mm) | 2 | 2 | $39.80 | $26.45 | \* | [--------](https://core-electronics.com.au/short-flex-bend-sensor.html) |
| Force Resistive Sensor | 1 | 1 | $12.50 | $15.35 | \* | [--------](https://core-electronics.com.au/force-sensitive-resistor-0-5.html) |
| Adafruit Feather 32u4 Bluefruit LE | 1 | 1 | $58.30 | $58.30 | \* | [--------](https://core-electronics.com.au/adafruit-feather-32u4-bluefruit-le.html) |
|  |  |  |  |  |  |  |
| Total: | 10 | 10 | $109.80 | $100.10 |  |  |

**Change Log:**

Microcontroller: Adafruit Feather 32u4 Bluefruit LE

sensors:

- FlexSensors x 5

- Force Resistive Sensor

battery: 2-pin JST-PH connection battery 3.7V 1100mAh

gloves used: woollen digital touch gloves

connections:

- Jumper Wires

- Solder

- soldering Pins

other:

- 3d printed battery protection plate

fixed previous issues:

- un-able to transfer data wirelessly

- un-able to access all flex sensor data due to 3 ADC pins

- hard to read data

- electronics vulnerable to the elements

- un-able to recognize Force Sensitive Sensors

issues:

- Connections unstable and easy to break

- restricted movement

- electronics vulnerable to breakage

- electronics can overheat easily

- un-able to access gyroscopic and accelerometer sensors

- hard to access port to change and upload data

- un-able to convert data to verbal form of communication

**Glove Project v4: New Sensors**

**Costs:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Products: | Estimated amount: | Amount: | Proposed Cost: | Actual Cost: | Necessary: | Link: |
|  |  |  |  |  |  |  |
| Total: | 0 | 0 | $00.00 | $00.00 |  |  |

**Change Log:**

Glove Project v4: New Sensors

Microcontroller: Adafruit Feather 32u4 Bluefruit LE

sensors:

- FlexSensors x 5

- Force Resistive Sensor

- Accelerometer and Gyroscopic Sensors

battery: 2-pin JST-PH connection battery 3.7V 1100mAh

gloves used: woollen digital touch gloves

connections:

- Jumper Wires

- soldering Pins

- Solder

other:

- 3d printed battery protection plate

fixed previous issues:

- un-able to access gyroscopic and accelerometer sensors

issues:

- Connections unstable and easy to break

- restricted movement

- electronics vulnerable to breakage

- electronics can overheat easily

- hard to access port to change and upload data

- un-able to convert data to verbal form of communication

**Glove Project v5: Style, Protection, and Functionality**

**Costs:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Products: | Estimated amount: | Amount: | Proposed Cost: | Actual Cost: | Necessary: | Link: |
| Short flex Sensor (77.57mm) | 5 | 5 | $75.00 | $75.00 | \* | [--------](https://core-electronics.com.au/short-flex-bend-sensor.html) |
| Force Resistive Sensor | 1 | 1 | $12.50 | $12.50 | \* | [--------](https://core-electronics.com.au/force-sensitive-resistor-0-5.html) |
| Adafruit LSM6DSOX 6 DoF Accelerometer and Gyroscope | 1 | 1 | $23.30 | $23.30 | \* | [--------](https://core-electronics.com.au/adafruit-lsm6dsox-6-dof-accelerometer-and-gyroscope-stemma-qt-qwiic.html) |
| Adafruit Feather 32u4 Bluefruit LE | 1 | 1 | $58.30 | $58.30 | \* | [--------](https://core-electronics.com.au/adafruit-feather-32u4-bluefruit-le.html) |
| Gloves | 1 | 1 | $8.00 | $12.00 | \* | [--------](https://www.kmart.com.au/product/thinsulate-gloves-s160880/) |
| usb mini-b breakout | 1 | 1 | $4.05 | $4.05 | \* | [--------](file:///C:\Users\Lucas%20Newman\Documents\2023\Term%202\PIP\Projects\Glove%20Project\|%20https:\core-electronics.com.au\usb-mini-b-breakout-board.html) |
|  |  |  |  |  |  |  |
| Total: | 10 | 10 | $181.60 | $185.60 |  |  |

**Change Log:** <!>Not working due to technical difficulties with sensors<!>

Microcontroller: Adafruit Feather 32u4 Bluefruit LE

sensors:

- FlexSensors x 5

- Force Resistive Sensor

- Accelerometer and Gyroscopic Sensors

battery: 2-pin JST-PH connection battery 3.7V 1100mAh

gloves used: Thinsulate gloves

connections:

- Jumper Wires

- Solder

other:

- 3d printed battery protection plate

- 3d printed electronics protection plate

- USB mini Type B breakout

- App designed to convert the data to verbal communication

<!> Not Tested <!>

fixed previous issues:

- Connections unstable and easy to break

- restricted movement

- electronics vulnerable to breakage

- electronics can overheat easily

- hard to access port to change and upload data

- un-able to convert data to verbal form of communication

issues:

* Sensors not fully working

**Glove Project v6: Words, phrases and functionality**

**Costs per glove:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Products: | Estimated amount: | Amount: | Proposed Cost: | Actual Cost: | Necessary: | Link: |
| Short flex Sensor (77.57mm) | 6 | ?? | $167.75 | $??.?? | \* | [--------](https://core-electronics.com.au/short-flex-bend-sensor.html) |
| Adafruit LSM6DSOX 6 DoF Accelerometer and Gyroscope | 2 | ?? | $68.10 | $??.?? | \* | [--------](https://core-electronics.com.au/adafruit-lsm6dsox-6-dof-accelerometer-and-gyroscope-stemma-qt-qwiic.html) |
| Gloves | 1 | ?? | $8.00 | $??.?? | \* | [--------](https://www.kmart.com.au/product/thinsulate-gloves-s160880/) |
| USB-C breakout | 1 | ?? | $4.05 | $??.?? | \* | [--------](file:///C:\Users\Lucas%20Newman\Documents\2023\Term%202\PIP\Projects\Glove%20Project\|%20https:\core-electronics.com.au\usb-mini-b-breakout-board.html) |
| Raspberry Pi zero W | 1 | ?? | $24.50 | $??.?? | \* | [--------](https://core-electronics.com.au/raspberry-pi-zero-w-wireless.html) |
| Speaker board | 2 | ?? | $13.30 | $??.?? | \* | [--------](https://core-electronics.com.au/adafruit-i2s-3w-class-d-amplifier-breakout-max.html?gclid=CjwKCAjw3dCnBhBCEiwAVvLcuxO7K_vX8nFltzw0RQB6Wo3syYZIuSg-_hk7IlOp5O4IiEPB4Ne2UxoCrDcQAvD_BwE) |
| Mini oval speaker | 1 | ?? | $5.70 | $??.?? | \* | [--------](https://core-electronics.com.au/mini-oval-speaker-8-ohm-1-watt.html) |
| JST-PH 3-pin connector battery | 1 | ?? | $7.65 | $??.?? | \* | [--------](https://core-electronics.com.au/3-pin-lipo-battery-for-pijuice-zero-1000mah.html) |
| ?Battery Hat for raspberry Pi zero? | 1 | ?? | $73.00 | $??.?? | \* | [--------](file:///C:\Users\Lucas%20Newman\Documents\2023\Term%202\PIP\Projects\Glove%20Project\|%20https:\core-electronics.com.au\usb-mini-b-breakout-board.html) |
| Speaker system | 1 | ?? | $??.?? | $??.?? | \* | [--------](file:///C:\Users\Lucas%20Newman\Documents\2023\Term%202\PIP\Projects\Glove%20Project\|%20https:\core-electronics.com.au\usb-mini-b-breakout-board.html) |
| Backlight proto-board | 1 | ?? | $13.90 | $??.?? | \* | [--------](https://core-electronics.com.au/bakelite-universal-perfboard-plates-pack-of-10.html) |
| Total: | 16 | ?? | $378.00 | $185.60 |  |  |

**Buying log:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Products: | Estimated amount: | Amount: | Proposed Cost: | Actual Cost: | Necessary: | Link: |
| Speaker board | 2 | ?? | $13.30 | $??.?? | \* | [--------](https://core-electronics.com.au/adafruit-i2s-3w-class-d-amplifier-breakout-max.html?gclid=CjwKCAjw3dCnBhBCEiwAVvLcuxO7K_vX8nFltzw0RQB6Wo3syYZIuSg-_hk7IlOp5O4IiEPB4Ne2UxoCrDcQAvD_BwE) |
| Mini oval speaker | 1 | ?? | $5.70 | $??.?? | \* | [--------](https://core-electronics.com.au/mini-oval-speaker-8-ohm-1-watt.html) |
| Backlight proto-board | 1 | ?? | $13.90 | $??.?? | \* | [--------](https://core-electronics.com.au/bakelite-universal-perfboard-plates-pack-of-10.html) |
|  |  |  |  |  |  |  |
| Total: | 13 | ?? | $280.70 | $??.?? |  |  |

**Buying log 2:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Products: | Estimated amount: | Amount: | Proposed Cost: | Actual Cost: | Necessary: | Link: |
| MCP3008 | 2 | ?? | $17.50 | $??.?? | \* | [--------](https://core-electronics.com.au/mcp3008-8-channel-10-bit-adc-with-spi-interface.html?gad_source=1&gclid=Cj0KCQjwncWvBhD_ARIsAEb2HW9VNcHC3AHfXAZBQ0XgpHgJ-8PtSlQXl1KcxzanU76gbkQho_ta-egaAkndEALw_wcB) |
| Gloves | 1 | ?? | $8.00 | $??.?? | \* | [--------](https://www.kmart.com.au/product/thinsulate-gloves-s160880/) |
| JST-PH 3-pin connector battery | 1 | ?? | $7.65 | $??.?? | \* | [--------](https://core-electronics.com.au/3-pin-lipo-battery-for-pijuice-zero-1000mah.html) |
| Total: | 13 | ?? | $33.15 | $??.?? |  |  |

**Change Log:** <!>Work in progress<!>

Computer: Raspberry Pi Zero Wireless

Data analysis: Neural Network based on collected data

sensors:

- FlexSensors x 11

- Accelerometer and Gyroscopic Sensors x 2

battery: 3-pin JST-PH connection battery 3.7V 1000mAh

gloves used: To be determined

connections:

- Jumper Wires

- Solder

- protoboard

other:

- 3d printed battery protection plate

- 3d printed electronics protection plate

-

<!> Not Tested <!>

fixed previous issues:

- Connections unstable and easy to break

- restricted movement

- electronics vulnerable to breakage

- electronics can overheat easily

- hard to access port to change and upload data

- un-able to convert data to verbal form of communication

- Sensors not fully working

issues: