

Materials List:

Off the shelf items:

- Arduino compatible pressure transducer x 1 (\$15.95)  
Amazon url: [https://www.amazon.com/SENSING-RESISTOR-SQUARE-1oz-22LBS-SPACING/dp/B00B887DBC/ref=sr\\_1\\_5?ie=UTF8&qid=1517864454&sr=8-5&keywords=arduino+pressure+sensor](https://www.amazon.com/SENSING-RESISTOR-SQUARE-1oz-22LBS-SPACING/dp/B00B887DBC/ref=sr_1_5?ie=UTF8&qid=1517864454&sr=8-5&keywords=arduino+pressure+sensor)

Justification: this is the sensor we will use to measure the tension on the leash held by the blind person. In case the robot is moving too fast for the blind person he/she can pull on the leash and when the force on the transducer hits a certain threshold, the robot will slow down.

- Arduino with integrated wifi x 1 (\$98.40)  
Amazon url: [https://www.amazon.com/Arduino-Shield-Integrated-Antenna-Microcontroller/dp/B00WH5XQF2/ref=sr\\_1\\_10?s=industrial&ie=UTF8&qid=1517864672&sr=1-10&keywords=arduino+with+wifi](https://www.amazon.com/Arduino-Shield-Integrated-Antenna-Microcontroller/dp/B00WH5XQF2/ref=sr_1_10?s=industrial&ie=UTF8&qid=1517864672&sr=1-10&keywords=arduino+with+wifi)

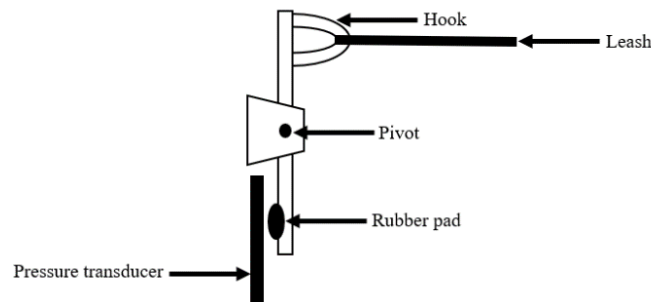
Justification: This Arduino will read the analog signal from the transducer and send those values over wifi.

- Nylon rope/leash x 1 (11.99)  
Amazon url: [https://www.amazon.com/Blueberry-Pet-Durable-Classic-Leashes/dp/B00HWQS34U/ref=sr\\_1\\_1\\_sspa?s=pets-supplies&ie=UTF8&qid=1517864843&sr=1-1-spons&keywords=nylon+leash&psc=1](https://www.amazon.com/Blueberry-Pet-Durable-Classic-Leashes/dp/B00HWQS34U/ref=sr_1_1_sspa?s=pets-supplies&ie=UTF8&qid=1517864843&sr=1-1-spons&keywords=nylon+leash&psc=1)

Justification: This is the interface between the user and robot. The blind person will control the speed of the robot by exerting tension on the leash much like how they would do it with a service animal.

Custom fabrication:

- Bracket to convert tension force on the leash to pressure on transducer. See Figure 1, when the user exerts tension on the leash, the rubber foot exerts a compressing force on the transducer.
- Custom bracket and casing to secure the Arduino.



**Figure 1:** lever setup to covert tension into compression.