Smart Cane
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Our Goal
Create an alternative to the cane used by the blind that has a larger detection range to help a visually impaired person navigate the world and live an independent life.

Software Flow

- Trigger holdoff
- Begin 20µs sensor trigger signal
- 20µs timer up
- Set trigger signal low, begin holdoff timer
- UART Rx
- Read UART range data
- Adjust for user height, determine pulse period
- Write pulse period to rumble disk PWM

Legend
- Arrows
- Test
- Pipe
- Main Code

Product

- Embedded rumble disks communicate ranging data
- Smaller than a retractable dog leash
- Long range sensor to get a bigger picture
- Short range sensors to detect immediate obstacles

2 types of sensors:
- precise detection up close
- long-range detection up to 25 feet

Ultrasonic Ranging Sensors

- Long range
- Short range

Manufacture and maintenance

- Lightweight aluminium body—great weight-price ratio
- 5000mA battery for multi-day battery life

2 Stage Calibration:
- Factory Level: each sensor must go through a rigorous controlled testing environment
- User Level: one time adjustment for user’s height

Testing/Simulation

- Physical: 3 LED/Vibration Disc breakout board
- MATLAB: simulated static and dynamic situations

Sources
https://www.makeblock.com/trasonic_Sensors/MB1200.htm
https://www.makeblock.com/Ultrasonic_Sensors/MB1563.htm