SMARTCANE

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MOTIVATION

- 1.2 million Canadians have some form of visual loss, 4.1% of the group being completely blind
- The visually impaired are 50% less likely to take independent trips and 70% more likely to fall
- Traditional white canes can only provide minimal information about obstacles and paths

OUR SOLUTION

- Smart Cane
  - LiDAR
  - Stereo Camera (Oak-D-Lite)
  - Vibration Motor
  - Omnidirectional Wheel + motor:
  - Enclosure:
    - Battery, computation, and sensors mounted to cane with enclosure
    - Cover allows cane to be weather resistant, for use in various environments
    - Enclosure is a bottom-heavy design that allows the sensors to self correct and stay right-side-up

ALTERNATIVE SOLUTIONS

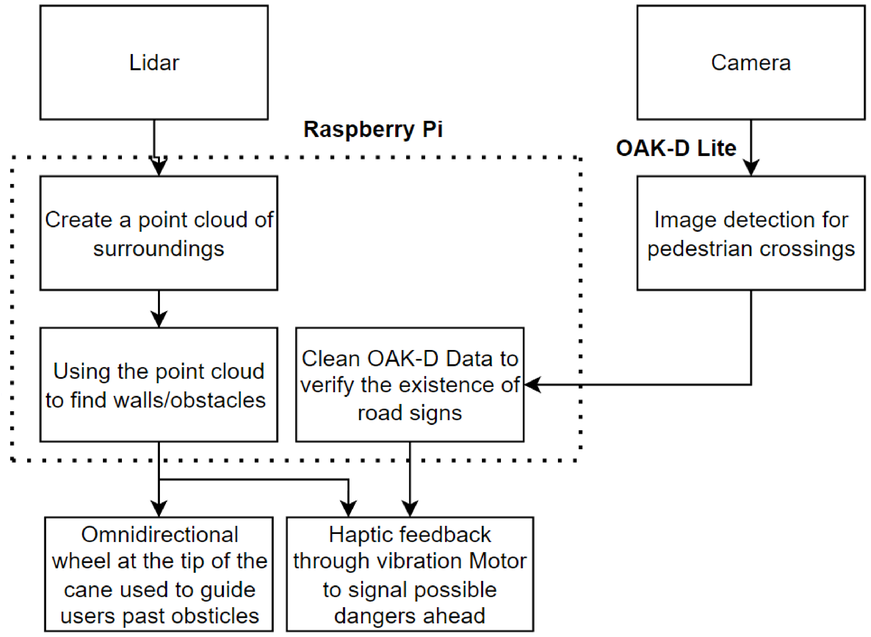
- Solution #1: Tactile Display
  - Tactile pins push a pattern to communicate danger in environment
- Solution #2: Smart Walker:
  - Powered wheels to guide user to avoid obstacles by turning and soft breaking

FEATURES

- Foldable
- Haptic feedback
- Roadsign detection for short and long range precision

Criteria	Actual
Weight < 3kg	✗
Battery Life > 8 Hr	✓
Length > 1m	✓
Cost < $1000	✓
Detect Obstacles > 5m	✓
Support > 65kg	✓

SOFTWARE DESIGN



FUTURE IMPROVEMENTS

- Audio feedback
- Change in elevation monitoring
- More advanced computer vision functionality (depth estimate) with LiDAR

ACKNOWLEDGEMENTS

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