**Name(s)**

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**Project Number**

**J1030**

**Project Title**

# Surround3: The Design and Construction of a Sensor-Enhanced Probing Cane to Help the Visually Impaired

**Abstract**

**Objectives**

The objective of this project is to create a blind cane with sensors that is simple to use, operates on a rechargeable, low-power battery, and detects objects at a distance of more than one meter. In addition, it should be easily mounted to a variety of canes, and fairly inexpensive.

**Methods**

Ultrasonic sensors, an Arduino Nano microcontroller, rechargeable batteries, a cane, and vibrational motors. Sensors are used to measure distance from objects. The microcontroller converts distance into vibrational feedback on the handle of the cane.

**Results**

The final design was measured against other products on a comparison chart, which included categories such as price, weight, and detection range. It outperformed all of the competitors by an average of 51%. Surround3 was successfully able to detect objects from a distance of over one meter away.

**Conclusions**

My project, Surround3, worked as I had envisioned when I started the designing. The final prototype is simple to use, runs on a low-power battery, and detects objects over one meter away. In addition, it can be easily mounted to a variety of canes, which makes it more compatible with the user s needs. Surround3 cost about $40 in parts, and does not take up too much space on the cane handle. It is rechargeable through a micro-USB cable. All of these aspects make Surround3 ideal for visually impaired users, so that they can navigate safely and confidently.

**Summary Statement**

I created a ultrasonic sensor-enhanced blind cane that helps visually impaired individuals navigate safely and confidently.

**Help Received**

I designed and built the electronic circuits myself. I created 3D models and printed the components and assembled the cane myself. I received help from a friend's parent to debug my initial microcontroller code.