



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY**

Name(s) Agam Randhawa	Project Number J1027
Project Title A Cheap Adjustable Distance Sensing Electric Cane to Help the Blind	
<p style="text-align: center;">Abstract</p> <p>Objectives To help the blind, make an affordable electric cane that will beep if an object is within an adjustable range controlled by the user.</p> <p>Methods HC-SR04 ultrasonic sensor for calculating distance, potentiometer for controlling range, piezo-buzzer for alerting the user and an Arduino Uno Microcontroller for connecting all the components. Prototypes were tested on wood, metal, and cloth at varying distances. An Arduino library called NewPing by Tim Eckel was used for distance calculation.</p> <p>Results Three different prototypes were created over the duration of the project. The first and the second model had issues with random beeping which were fixed by changing the Arduino code to ignore any zero output readings from the HC-SR04 sensor. My third and final model worked on all materials without any random beeping from the full range of 0-200 cm.</p> <p>Conclusions My final model's testing shows that the cane was reliable as it worked on all of the materials from 0-200 cm. I was able to meet my goal of affordability by keeping the total cost under six dollars.</p>	
Summary Statement My project is about making a cheap electronic distance sensing attachment to a white cane that helps blind people stay safe.	
Help Received I designed, created and coded the project myself with guidance from my Dad and help from the internet.	