CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)

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Project Number

J0902

Project Title

Sensored

Abstract

Objectives/Goals

Our project tests the suitability of ultrasonic and infrared sensors for use with haptic devices to help the blind live a normal life. This concept can be further extended to other applications such as helping military personnel to navigate through the dark.

Methods/Materials

We used an Arduino micro controller to measure the sensor readings and display them on a computer. We tested the sensor's accuracy with objects of different properties, sizes, and external factors like wind. The sensors were placed side by side to reduce the margin of error due to variations in environmental conditions.

Results

Neither sensor was found to be suitable for our application under all conditions. Our infrared sensor's accuracy was adversely affected by the reflective surface that dispersed light and the glass surface transparent to infrared beams. Our ultrasonic sensor didn#t accurately detect small object, sound absorbing object, or objects in the presence of wind.

Conclusions/Discussion

We would like to explore ways to deploy multiple sensors in a single haptic device to make it work reliably under all conditions. Further study should be conducted with other available ultrasonic and infrared sensors. Range sensors based on different technologies, like laser sensors, should also be evaluated.

Summary Statement

Our project tests the suitability of ultrasonic and infrared sensors for use with haptic devices to help the blind live a normal life.

Help Received

Parents bought supplies and gave tips in programming.