



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Jahan Razavi	Project Number J0925
Project Title The NavHat: A Mobility Aid for the Blind	
Abstract Objectives/Goals The objective of this project was to build a mobility aid for the blind, called NavHat. It uses three ultrasonic radar modules connected to two earphones for the sides and to a cellphone buzzer for the front. As the person wearing the hat gets closer to an object, the earphones and the buzzer ping faster. Methods/Materials I used three radar modules that were powered by 9-volt batteries and switches. They were placed on a cardboard rim and were secured by screws and nuts. The switches and the batteries were taped to the rim. Results I tested NavHat on three people with different heights. I found the minimum and maximum distance from a wall, a window, and a picture frame before the pinging started and after it stopped. The data for the front had two outliers, while the other data were very closely spaced. The left-side data had a range of about 20 inches for the maximum distance. The right-hand data had the least variation, about 10 inches. Conclusions/Discussion My hypothesis was correct, and I did not run into any objects during testing. This can help the blind because it prevents them from running into objects to the sides and in front of them, thus reducing the number of injuries. The wearer would still need a white cane to walk around to detect objects on the ground.	
Summary Statement My project was to build a mobility aid for the blind consisting of three ultrasonic radar modules and test it on different people and with different obstacles.	
Help Received My father introduced the ultrasonic module to me. He also taught me how to solder. The idea of using three radars and placing them on a rim was mine.	