CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

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Project Number

J0307

Project Title

Nod Alarm for Drowsy Drivers: The NADD Project

Abstract

Objectives/Goals

Drowsy driving is common and can cause fatal accidents and severe injuries. The purpose of this project is to design, build and test a special device, worn as a headpiece, to trigger an alarm as the driver nods off, in a simulated drowsy state.

Methods/Materials

Experiments were performed to find the best metal conductor for the Experimental Triggering Device (ETD). Four types of metal conductors were tested: copper, tin, alloy, and steel. Once the best metal conductor was found, the ETD was build with a hollow tube, 2 ball bearings, conductive wires, and a sound card. Mounting angles were tested using a protractor to determine the best angle the ETD will trigger an alarm. The ETD was then tested at a stationary position. It was also tested during actual driving conditions at different road grades, head movements and sudden stops, with the driver nodding off, simulating a drowsy state.

Results

Copper was determined as the best metal conductor for the ETD. The ETD was triggered best at a 40 degree mounting angle. At a stationary position, the ETD triggered consistently. During actual driving, the ETD, while tested in a simulated drowsy state, triggered reliably and consistently at different road grades. Except for sudden stops at 30 mph, there were no significant false alarms during head movements, and when driving over dips and humps.

Conclusions/Discussion

A prototype ETD was successfully designed, built and tested to alarm a driver as the head nods off in a simulated drowsy state under different driving conditions.

The ETD is a reliable and novel device that shows promise to reduce drowsy driving and potentially save lives.

Summary Statement

The central focus of this project is to design, build and test a device that will alarm a drowsy driver in a simulated drowsy state.

Help Received

Mentors: Richard and Nannette Hock provided advice in the materials used in the device, Edwin and Maria Garcia assisted in the building and testing of the device.