



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Gautam Soundararajan	Project Number J0831
Project Title Wake-O-Matic: User Alertness Monitoring Device	
Abstract Objectives/Goals The purpose of my project is to prevent fatigue related accidents by designing a simple, portable and affordable device that would alert the user as soon as he closes his eyes. Methods/Materials Based on my research, when an infrared beam is aimed at the eye, the amount of infrared reflected back is different when the eye is closed vs. open. My procedure involved the design of an electrical circuit which used an IR emitter and an IR detector aimed at the eye and triggering circuitry which included a transistor switch and a piezo transducer buzzer to alert the user when he closes his eyes for more than a couple of seconds. The circuit is mounted on a pair of eye glasses to be worn when the user is susceptible to fatigue under dangerous conditions. Results The device was tested on 20 human subjects of different skin tones and eye colors as well as under different lighting conditions to make sure that it will function as expected. I was able to sound the buzzer in my circuit when the user closed his eyes for more than a couple of seconds. Conclusions/Discussion Infrared reflection is different from an open vs. closed eye and this difference was sufficient to design a circuit to trigger a buzzer when the eye is closed. Wake-o-Matic is a simple, portable, and affordable device. The purpose of Wake-O-Matic is to help people avoid getting hurt by alerting them when they close their eyes.	
Summary Statement To design a simple, portable and affordable device that would alert the user as soon as he closes his eyes.	
Help Received Mother provided guidance in designing the circuit. Father helped build the circuit. Dr. John Webster guided in choosing the correct parts.	