Introduction:

The project aim to resolves the issue for two aspects:

1. Concussion detector:

Brain injury has always been a critical issue as it might not show up at the time of impact. Even after a minor head injury, brain function can be temporarily impaired and this is sometimes referred to as a concussion. This can lead to difficulties such as headaches, dizziness, fatigue, depression, irritability and memory problems. While most people are symptom-free within two weeks, some can experience problems for months or even years after a minor head injury. A concussion is a mild traumatic injury (TBI) that results in a temporary loss of normal brain function. It is usually caused after an impact to your head or after a whiplash-type injury that causes your head and brain to shake quickly back and forth. Such injuries can be caused while playing any sport like rugby or football or any other activity which causes a sudden blow to the head.

2. Sleep while driving:

Most of the road accident occurs because the driver falls asleep while driving due to excessive hard working throughout the day. In particular, in India, such accidents have high frequency and mostly committed by truck drivers, who takes a long journey and drive trucks day and night non-stop.

Methodology:

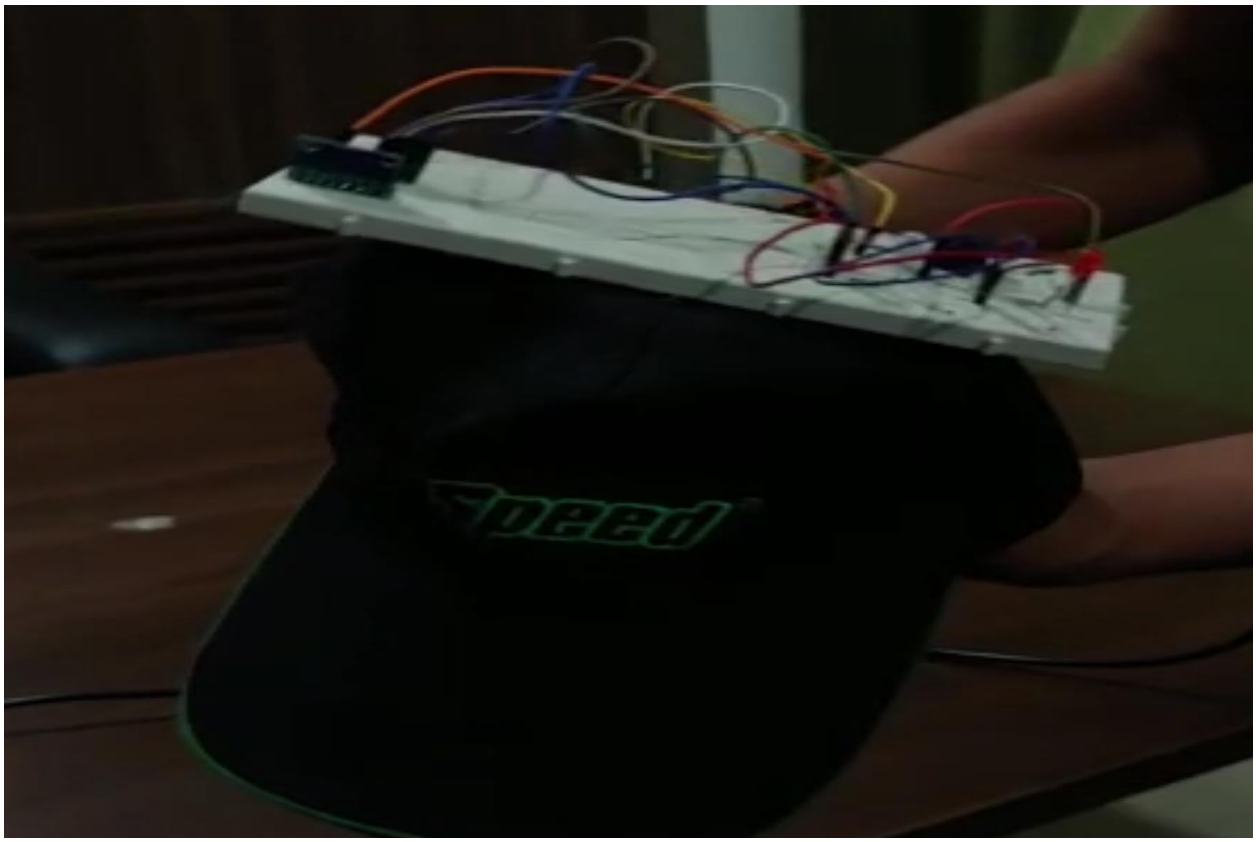
The Concussion Detection Helmet warns extreme athletes of potential traumatic brain injuries. The device records the force of impact on the users brain during a crash using an integrated accelerometer to calculate the force experienced by the users brain. If the force of impact may be enough to leave the user with a traumatic brain injury (TBI), red LEDs and a buzzer will sound alerting the user and the people surrounding. Drivers who work overnight often feel sleepy which could turn into an accident. For waking them up at the moment, the device will detect the movement of their head in a particular direction. It will measure the tilt angle of the head and will warn the user if it crosses a certain allowable limit of tilt
angle.

Working:

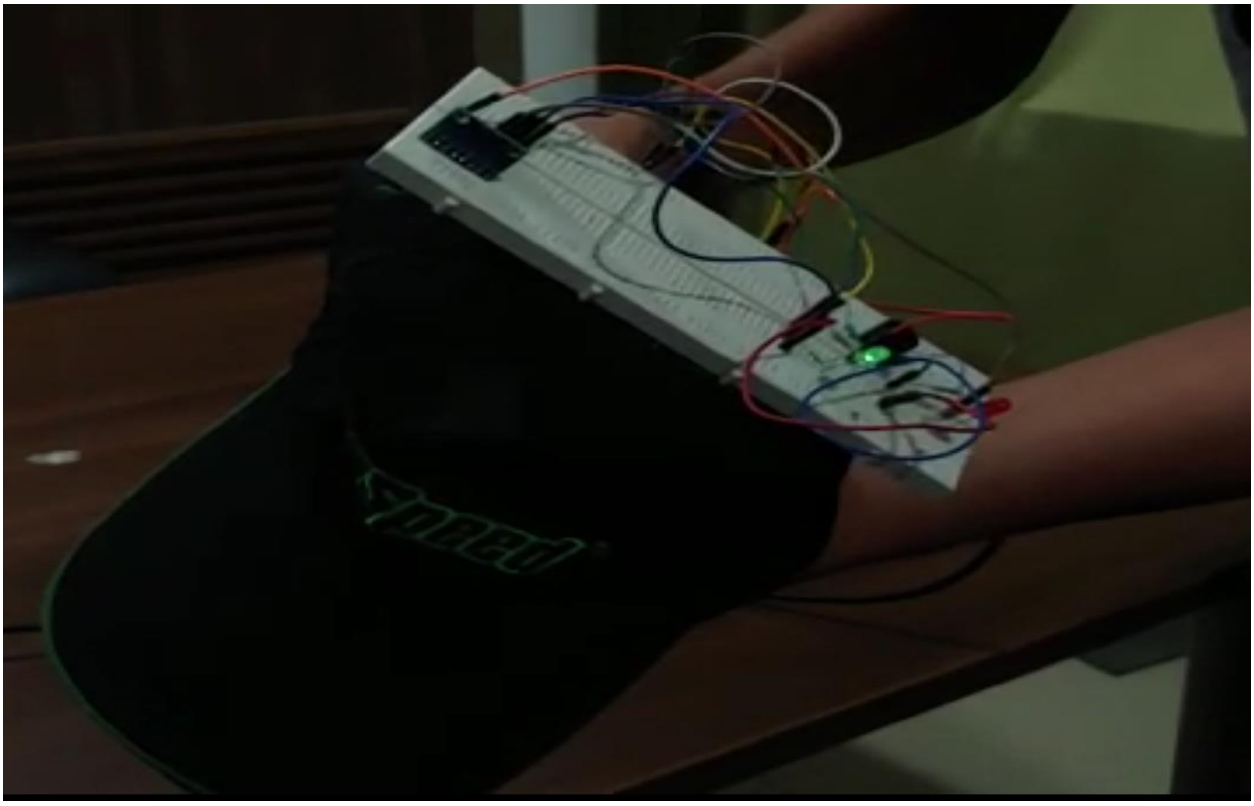
1. The device consists of an accelerometer which will find the acceleration in all three directions i.e. x, y, and z.
2. The Arduino is programmed in such a way that it takes those x, y and z components to find the magnitude of net acceleration.
3. If the magnitude of acceleration reaches a threshold value which might cause concussion injury, it will warn the user by blinking an LED and the buzzer will make sound.
4. Also, using the gyro sensor, the device will measure the head tilt angle, and will warn the driver to stay awake in case if he is sleeping.

Images illustrate the working of two feautes:-

1. Alert

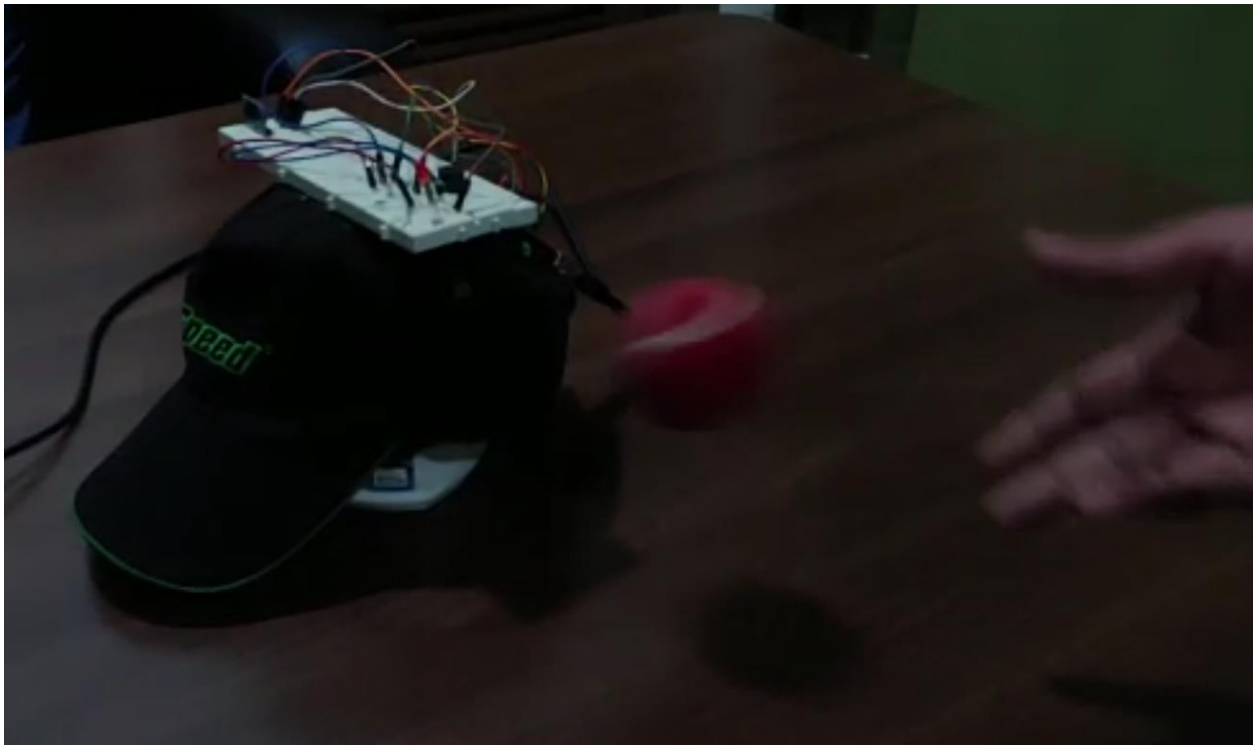


BEFORE TILTING



AFTER TILTING, TRIGGERS SOUND GENERATOR (GREEN LIGHT)

2. Concussion detector



BEFORE BALL HIT THE CAP

AFTER BALL HIT THE CAP (RED LIGHT TURNS ON)