

INTERNET OF THINGS (CSE-3009)



DRIVER DROWSINESS DETECTION SYSTEM

REVIEW 2 PRESENTATION
BY
TEAM 13

UNDER THE GUIDANCE OF
DR. VISHNU SRINIVASA MURTHY Y

Team Details



S.NO.	REG NO.	STUDENT NAME	ROLE
1	19BCE0496	HARSH VIVEK LONDHEKAR	Hardware
2	19BCE0596	MOHAMED ARSHAD PEERMOHAMED	Software
3	19BCE2255	RITIK SINGH	Software

Outline

- INTRODUCTION
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- APPLICATIONS
- TOOLS NEEDED AND PURCHASED
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- CONCLUSIONS
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Introduction

- Drowsiness can be described as a biological state where the body is in-transition from an awake state to a sleeping state.
- Here, We are using behavioral measures which are more practical drowsiness measurements methods.
- This project demonstrates three different non-invasive methods of drowsiness detection namely Eye-drowsiness Detection using Opencv and Aspect Ratio , Yawning detection using Euclidean distance between both lips , Pulse Rate Measurement and its Central Monitoring System.
- The project incorporates the driver monitoring system as well as the central monitoring system resulting in a complete safe drive ensuring module.



Motivation

Accidents are very common these days due to casual driving by civilians. A countless number of people including truck, taxi and bus drivers lose their lives due to drowsiness. Hence, there is need of a machine to monitor the drowsiness level of drivers and alert drivers as soon as it predicts the possibility of such occurrences. Driver drowsiness detection system helps to avoid accidents caused by drowsiness by advising drivers to take a break in time.

So in this project, we propose a system known as driver drowsiness detection system based on behavioral measures using machine learning techniques.

APPLICATIONS

Drowsy driver detection system can help potentially reduce the number of crashes related to drowsy driving. It can be used cars, trucks etc.

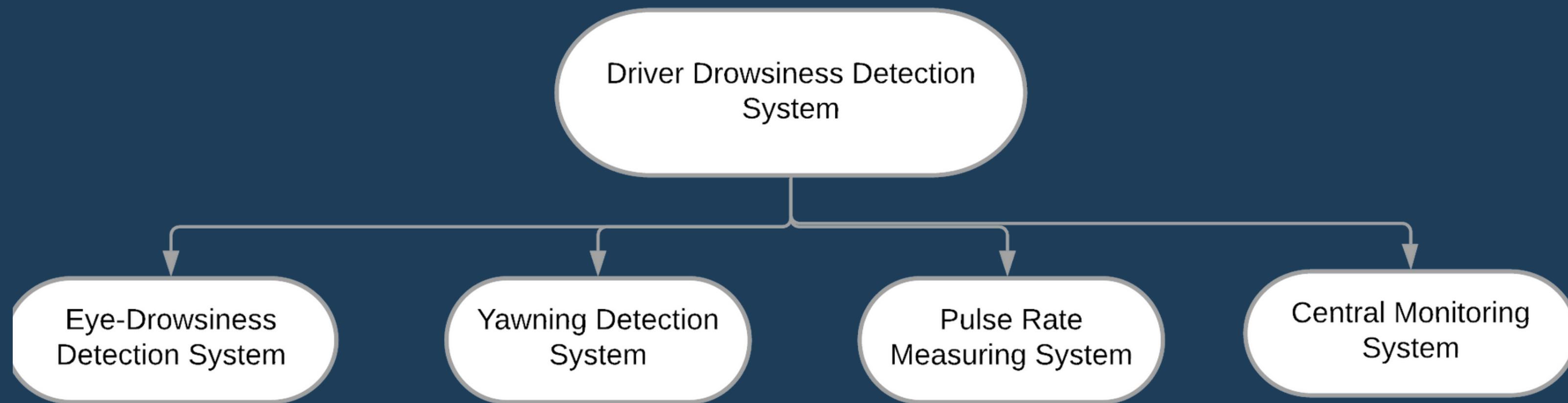
If the driver is feeling drowsy it will detect it and then an update will be sent to Driver and alarm will ring.

LITERATURE REVIEW

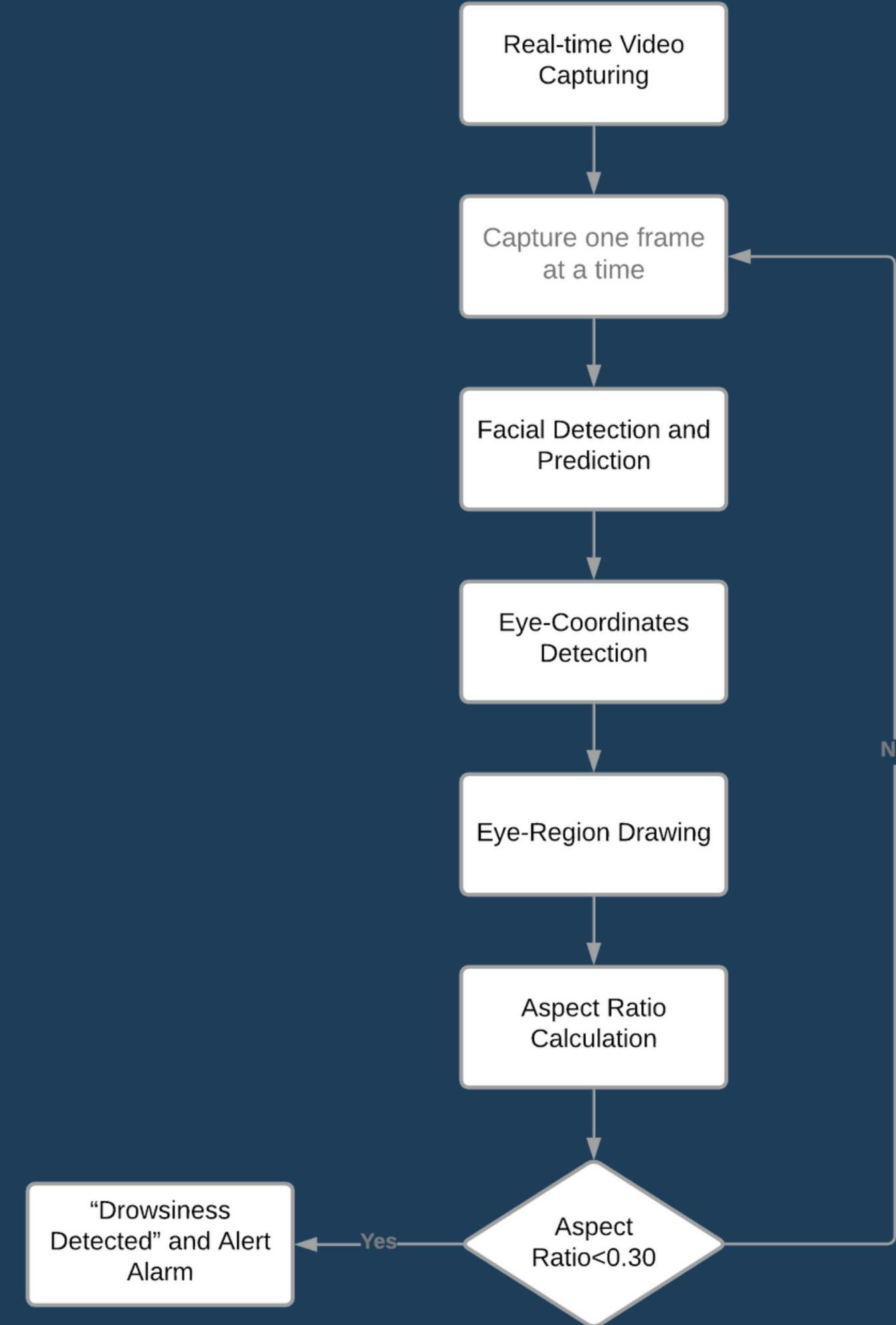
REF. APPROACH REMARKS ACCURACY

1	DriCare System uses multiple Convolutional Neural Networks (CNN)-KCF (MC-KCF), which optimizes KCF algorithm and CNN to assess the state of the eye	The experimental results show that when the driver is awake, the blinking frequency and eye-closing time are low. The MC-KCF algorithm demonstrates the best tracking accuracy. If the driver wears glasses and the driving environment is slightly dim, the accuracy of fatigue driving is reduced.	92%
2	Perclos Camshift algorithm Haar Training Viola Jones Algorithm	Input is captured by a camera, processed by the Raspberry-pi module, and the output is in the form of a buzzer that alerts the user, as and when, drowsiness is detected	All the 4 approaches are found to pretty accurate
3	Support Vector Machines (SVM), Hidden Markov Model (HMM), Convolutional Neural Network (CNN)	Analysis highlighted the performance of CNNs, which outperformed other approaches, but also showed that there is a need for larger datasets and standard benchmarking measures for drowsiness detection	CNN has the most accuracy

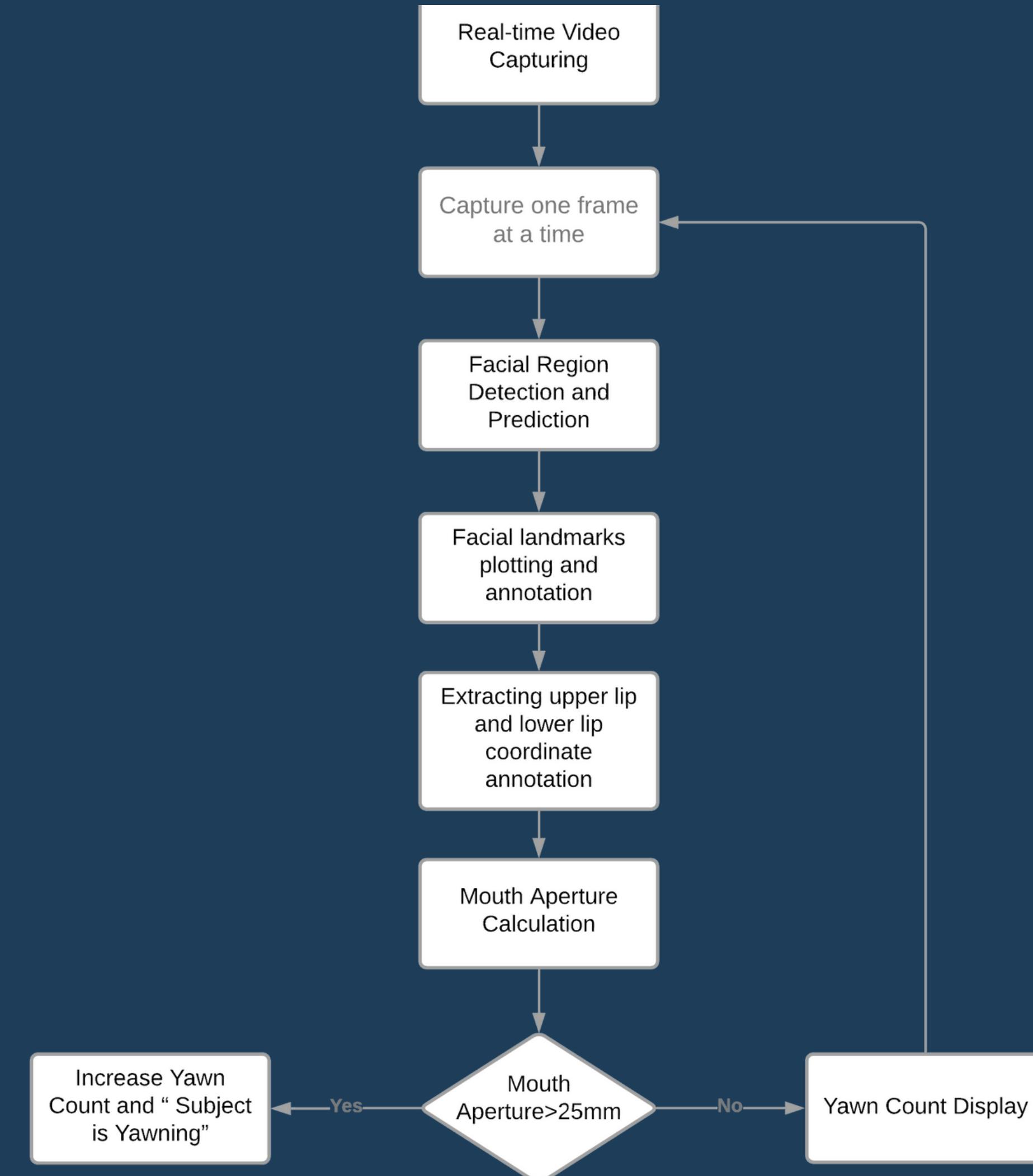
Proposed Methodology



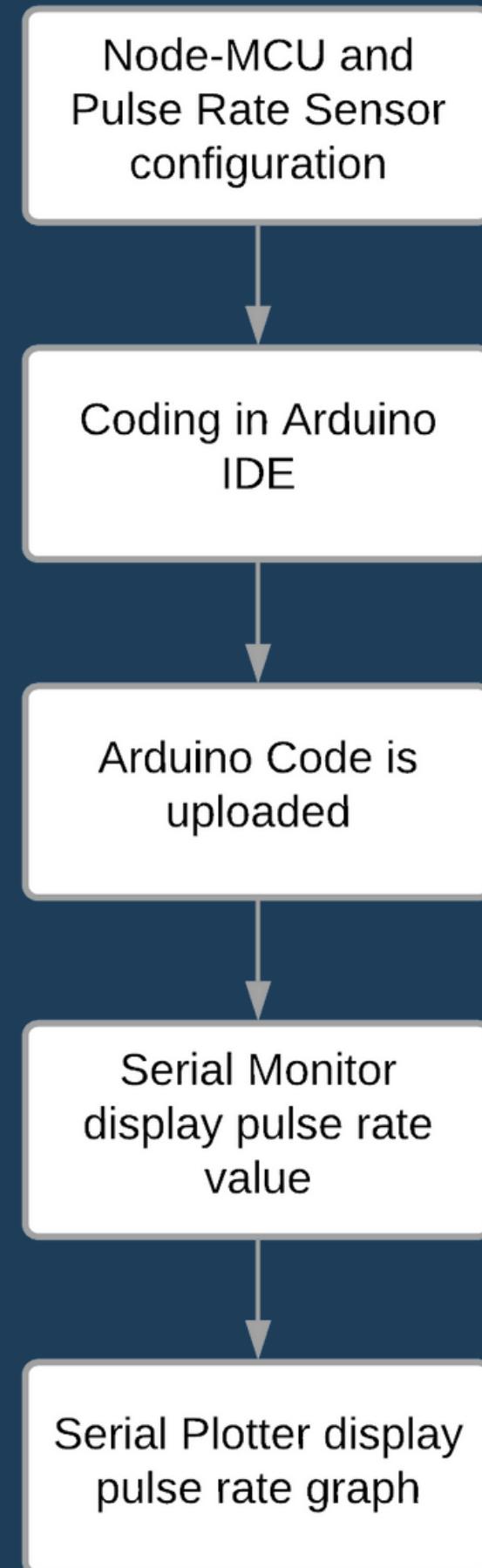
Eye-Drowsiness Detection System



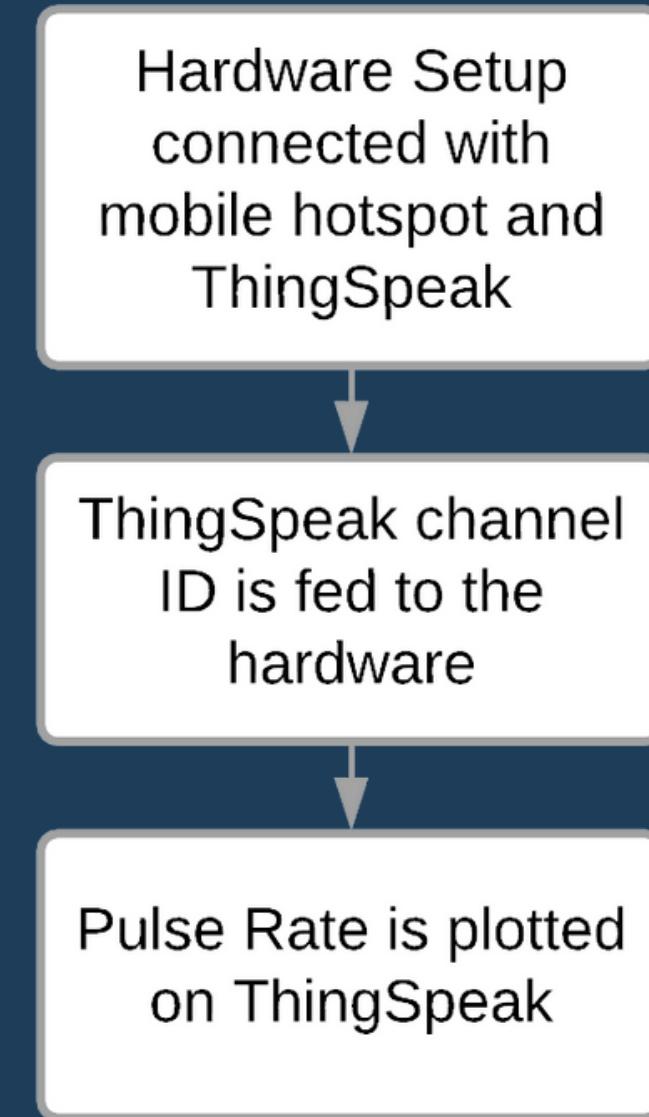
Yawning Detection System



Pulse Rate Measurement System

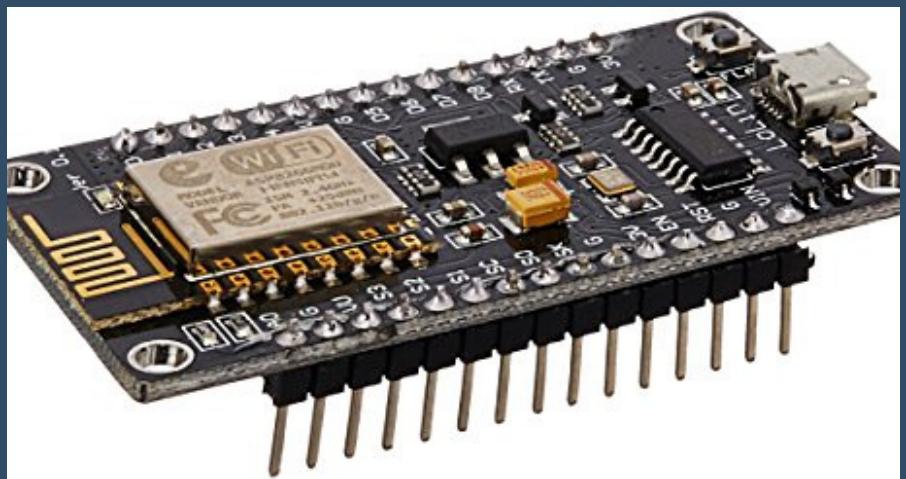


Central Monitoring System

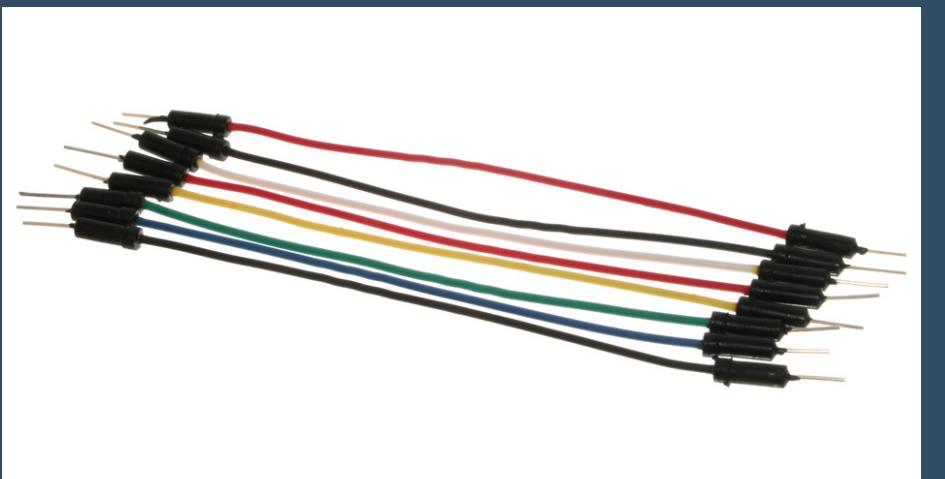


TOOLS USED AND NEEDED

NODE MCU



JUMPER WIRES



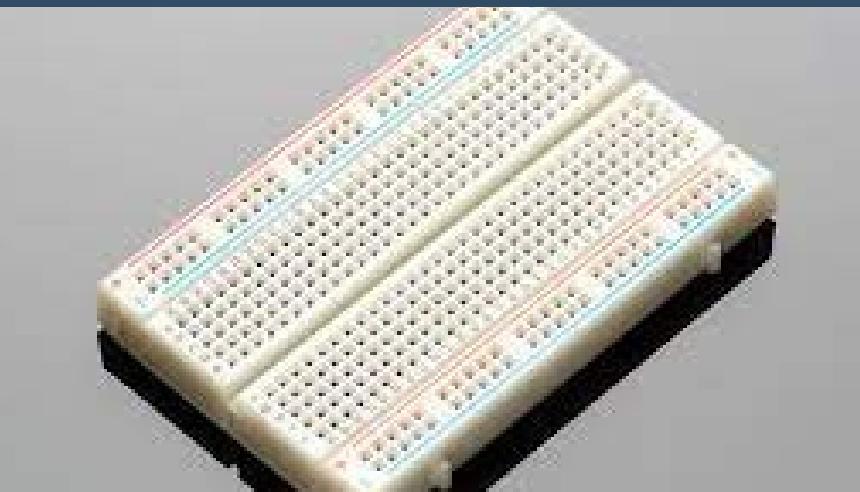
PULSE SENSOR



BUZZER

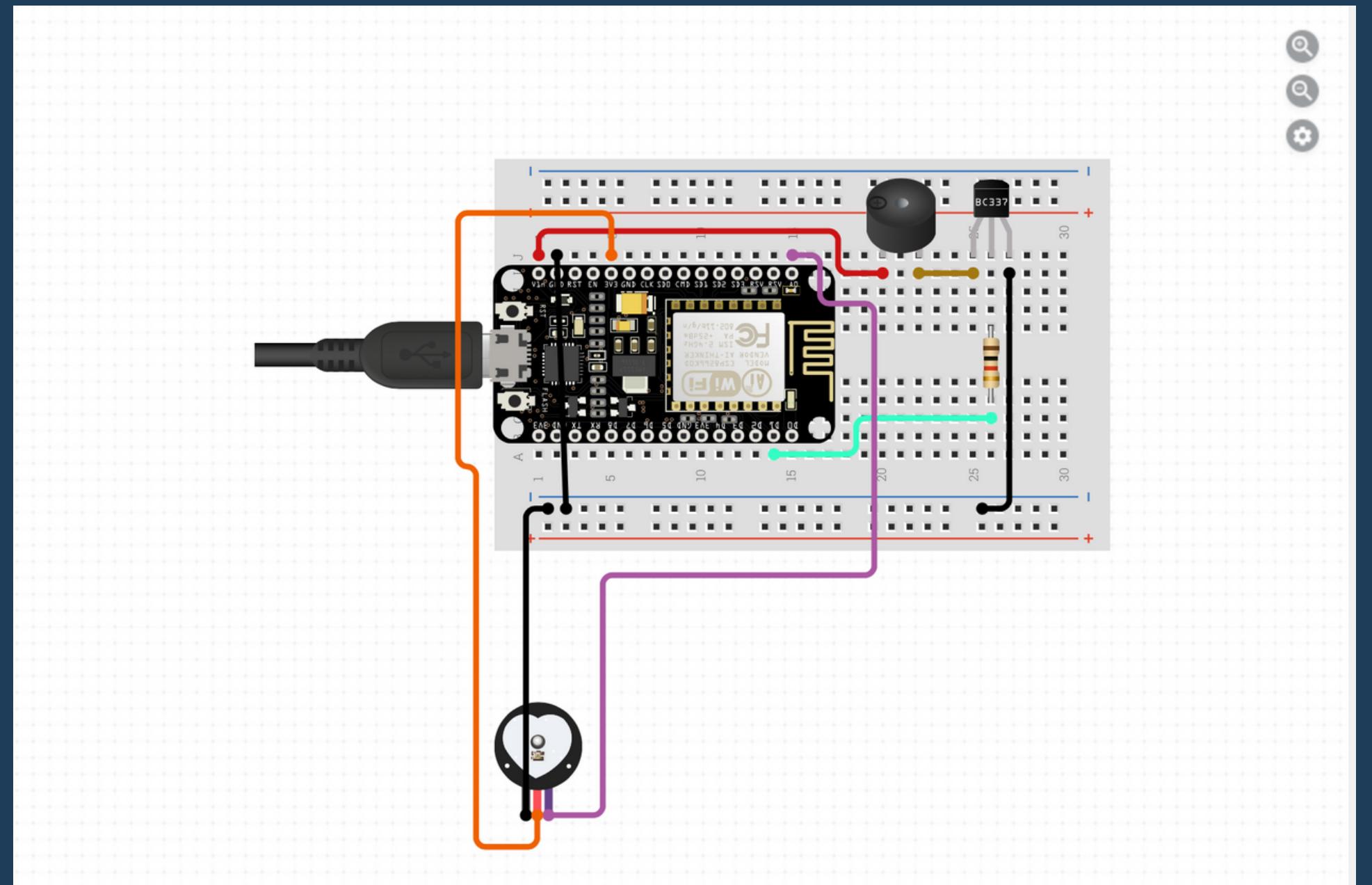


BREADBOARD

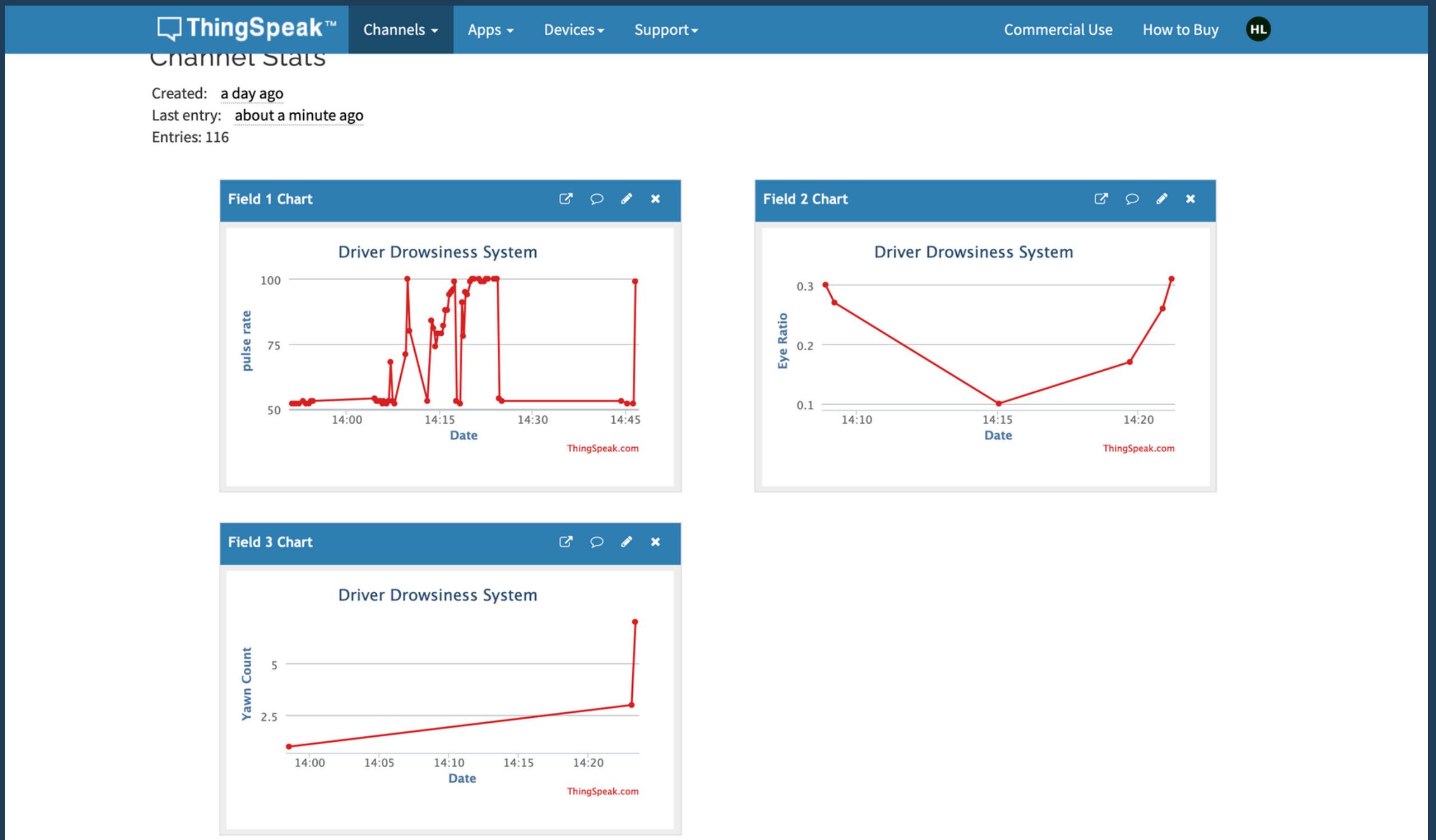




Circuit Diagram



ThingSpeak Data



Output received from Arduino



```
Yawn Count: 7.00
Pulse Sensorvalue=
67
Read from ThingSpeak: 67.000000000
Pulse Rate: 67.00
Read from ThingSpeak: 0.310000002
Eye Ratio: 0.31
Read from ThingSpeak: 7.000000000
Yawn Count: 7.00
Pulse Sensorvalue=
73
Read from ThingSpeak: 67.000000000
Pulse Rate: 67.00
Read from ThingSpeak: 0.310000002
Eye Ratio: 0.31
Read from ThingSpeak: 7.0
```

Autoscroll Show timestamp Newline 9600 baud Clear output



REFERENCES



[1] Wanghua Deng, Ruoxue Wu, "Real-Time Driver-Drowsiness Detection System Using Facial Features", IEEE, Volume-7, August 2019



[2] V B Navya Kiran, Raksha R, Anisoor Rahman, Varsha K N, Dr. Nagamani N P, "Driver Drowsiness Detection", IJERT, Volume-8 Issue-15, July 2020



[3] Mkhuseli Ngxande, Jules-Raymond Tapamo, Michael Burke, "Driver drowsiness detection using behavioral measures and machine learning techniques: A review of state-of-art techniques", IEEE, November 2017

CONCLUSIONS

- The proposed system can detect the drowsiness detection very accurately since three different systems are combined to design our project.
- Tendency of eye closing and yawning are both considered as signs of drowsiness and in any such case this system perfectly detects and alarms the driver about this condition.
- The pulse rate measuring and central monitoring system both keeps a check on users pulse rate in real time and thus indicates before the driver can fall asleep.
- This system will be a very important device to reduce road accidents and death rate due to this.

Contributions



S.NO.	REG NO.	STUDENT NAME	% OF CONTRIBUTIONS
1	19BCE0496	HARSH VIVEK LONDHEKAR	33.34%
2	19BCE0596	MOHAMED ARSHAD PEERMOHAMED	33.33%
3	19BCE2255	RITIK SINGH	33.33%



THANK YOU