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# Autonomous Driving Vehicle Using IOT And Artificial Intelligence

**Shivaprasad G[1], M N Chandan[2]**

PG Scholar, Dept. Of MCA, P.E.S College Of Engineering, Mandya, Karnataka, India[1]

Assistant Professor, Dept. Of MCA, P.E.S College Of Engineering, Mandya, Karnataka, India[2]

**Abstract:** This work we are automated the vehicle using the IOT components like Raspberry Pi 3B+, Arduino Uno, pi Camera, Motor driver and other sensors. Whole idea of this work is to Build the new generation smart vehicle which works without any human intervention and Vehicle traveled on the road.
In our Work vehicle will run in two modes Automated mode and Manual mode, when we have the proper road witch suites for self-driving like clear lane, clear Traffic signals and other requirement's, we use Automated mode otherwise we can change into Manual mode and Drive the vehicle.

**Keywords:** Raspberry-pi, Pi-Camera, Machine learning, Image processing**.**

## I. INTRODUCTION

As per the study in worldwide Approximately 1.3 million people are died and 20-30 million of peoples are get injuries in road accident every year. Accidents may occur in many reasons some of reasons of accidents are controllable and some are not. Controllable in the sense of human made mistakes it leads to the accident like over speed, not follow the traffic rules, drunk and drive etc. [4] from the so many years governments of regarding nation try to create awareness about the but the rate of accident didn't decrease.[2]
In this work we are developing a model of new generation smart car to avoid the human intervention in the Driving. And reduce road Accident and provide a safe travel.

Using Pi camera recording the video of the road and cuts that video into frame by frame and scan that frame and do the image processing, if that frame contains proper black color road with white color lane without any obstacle it will move otherwise it stops. and also, it scans traffic signals and follow those signals, also develop some smart and securing features to the car.[1]

It's a fully electric vehicle. it may lead to electric short-circuit and get fire, to detects in the early time we use smoke sensor, it will provide an alert message and stops the car. [7]And also, we use alcohol sensor whenever car in the manual mode alcoholic sensor is activated and we put it in the place of car staring, when manual mode is activated it check the alcoholic detection and then it allows to ride the car this work automatically avoids drink and drive and also avoids some road accidents.[5]

## II. EXISTING SYSTEM

In the existing system there are driver (human) driving vehicles which have high accident ratio.it can cause stress for driver The vehicles may get damaged or burnt by some short circuit or some engine problems.The vehicles may get crashed by Driver fault or a software problems. Also these vehicles didn't have a alcohol detector and smoke detector.

**Disadvantages**

- High accident ratio.
- High fuel consumption.
- High short-circuit ratio.
- High drink and drive case.

## III. PROPOSED SYSTEM

C In this project we are developing a model of new generation smart car to avoid the human intervention in the Driving. And reduce road Accident and provide a safe travel.[3]

Using Pi camara recording the video of the road and cuts that video into frame by frame and scan that frame and do the image processing, if that frame contains proper black color road with white color lane without any obstacle it will move

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otherwise it stops. and also, it scans traffic signals and follow those signals, also by using MQ2 sensor we can detect smoke in a vehicle and using MQ3 sensor we detect alcohol content inside a vehicle.[1]

**Advantages**

- Fast and efficient system
- Lane detection
- Stop sign detection
- Traffic sign detection
- Obstacle detection
- Smoke detection
- Alcohol detection
- It avoid drink and drive.
- This will prevent vehicle from get burnt by any electical short-circuit or any smoke or spark caused by engine failures.

**Model Working**

First pi camera recorded the video in front of car and then it sends the visuals to the raspberry pie and then scanning and image process will happen based on the visuals it sends the signals to the Arduino board and it will connect to the motor Driver and it controls he wheels of the car.[2]

Using the open cv Library try to train the data regarding to the road, traffic signals and other objects to the model and then using that library itself scan the data which collected from pie camara and all the activates are recorded and shows on desktop screen using the communication protocol and active IP in the raspberry pie.[4]

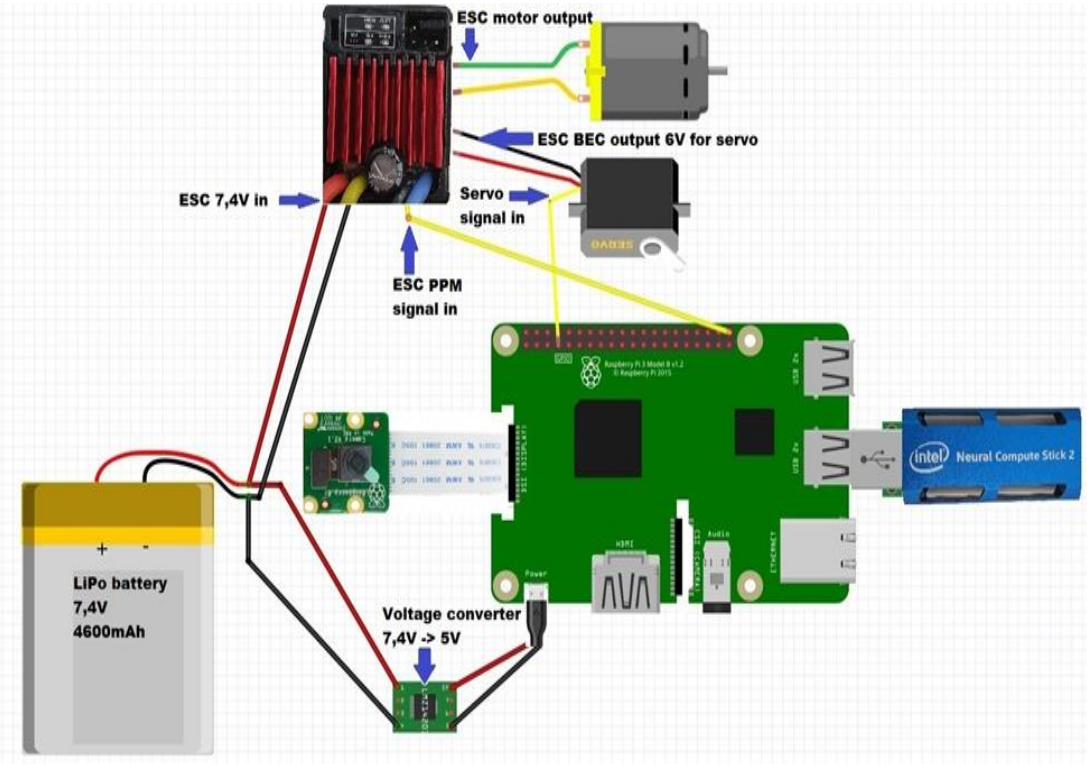


**Fig.1 Hardware connection diagram**

In this hardware connection first start with pie camera it will connects to the raspberry pie board and then it will be capturing the video and send to the raspberry pie board, and raspberry connect with the Arduino based on the footage it will send the signals to the Adriano board. Adriano board connect with motor controller which helps to controlee wheels of the car. Smoke sensor, Alcoholic sensors are directly connecting with the Arduino board.[3]

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## IV.HARDWARE COMPONENTS

### 1. Rassbary Pie 3B+

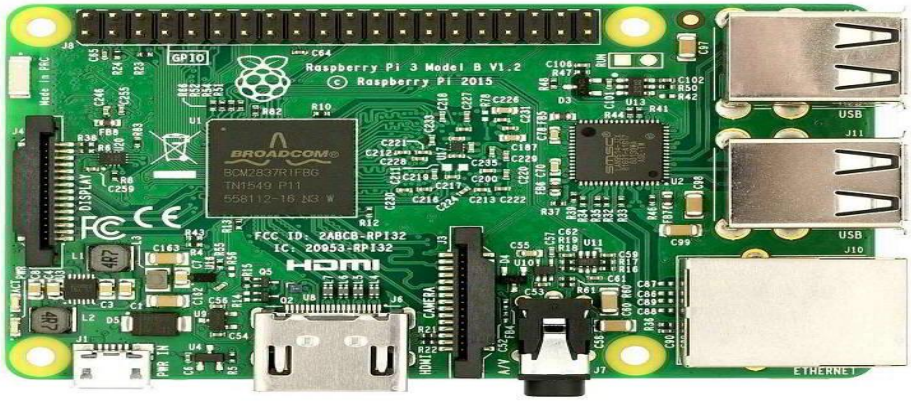


Fig.2Rassbary Pie 3B+

### 2. Arduino board

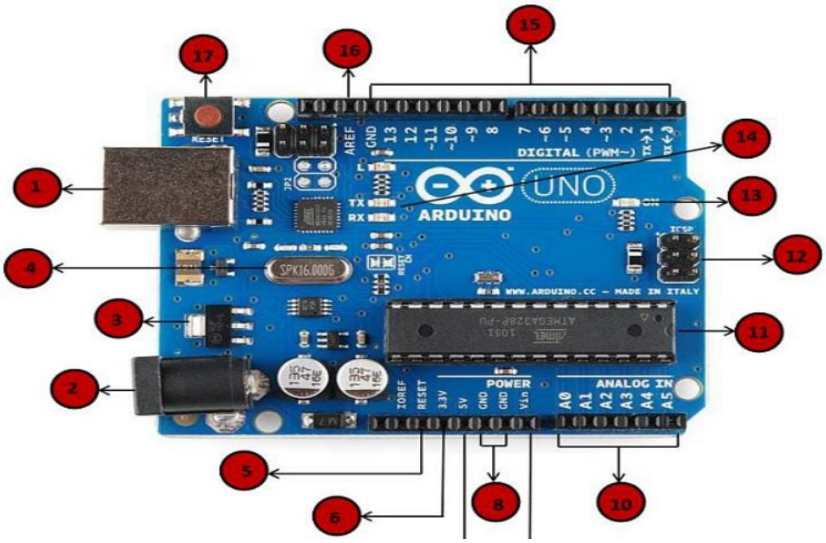


Fig.3 Arduino board

Arduino is a multi-programming single unit bord in this it can use for many works, it receives the signals from the raspberry and it sends the signals to the motor controller and it access other sensors like smoke sensor (MQ-2) and Alcoholic sensor (MQ-3).[2]

### 3. Pie Camera


Fig.4 Pie camera

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It is pie camera it will be mounted on the top of the car and it record the video of surroundings and send in to raspberry.[6]

**Motor controller**

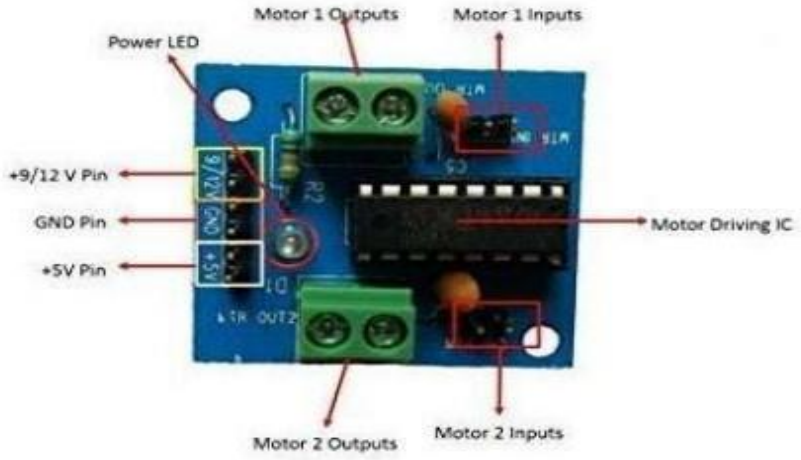


Fig.5 motor controller

It is Motor driver it will be used to control the wheels of the car all wheels will be made from DC motors and then all are connecting to motor controller. It gets signals from Arduino board and then it controls the wheels of the car.[2]

**Smoke sensor (MQ-2)**

Fig.6 MQ2 sensor

It's a smoke sensor it will used to detects smoke in early stages and it will provide alert notification.

**Alcohol sensor (MQ-3)**

Fig.7 MQ3 sensor

Its used in this project avoid drink and drive it is activated and it checks the driver.[7]

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## V. SYSTEM ARCHITECTURE

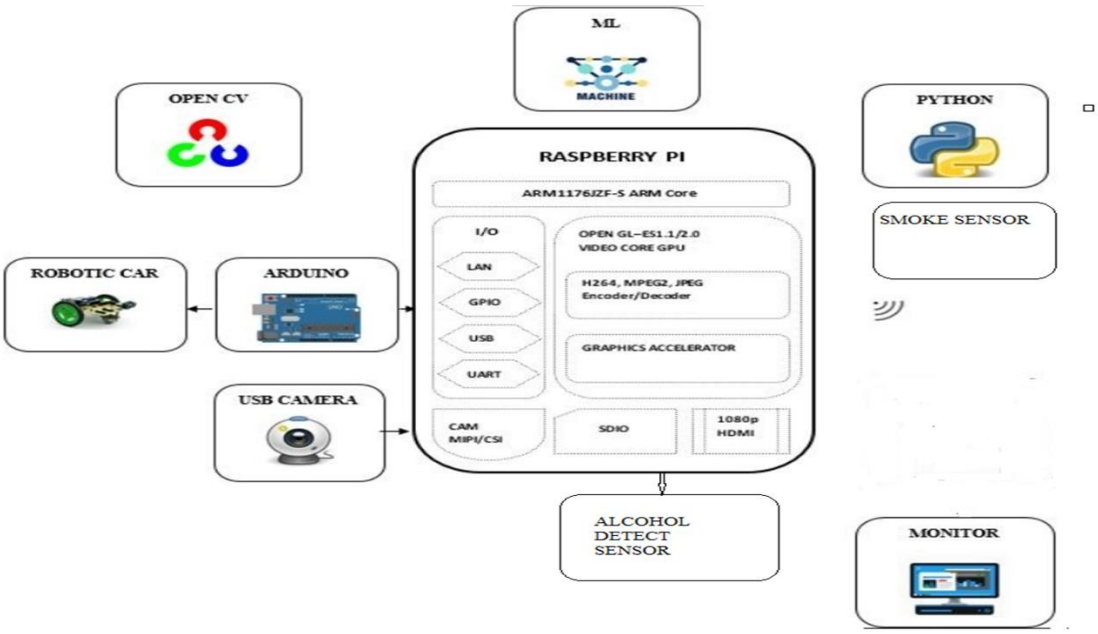


Fig 8 System Architecture

## VI. CONCLUSION

Final intention of this work is build new generation smart vehicle which helps the people to have a safe and Stress free traveling and also avoid the accidents using new technology. Iot is grown day by day very quickly we need to adapting to the new technologies and get the benefits from those.

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