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SELF DRIVING AUTOMATIC CAR

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Abstract –**This paper represents design and implementation of Self driving automatic car.By using raspberry pi as a master and Arduino as a slave it is controlling all the movement of the car. Pi camera captures the photos of barriers and sends it to the raspberry pi and raspberry pi does all the movement through the help of machine learning technique. Self - driving cars are autonomous vehicles that can drive by themselves without any human interference and has the potential to mark the technological revolution of the next decade. This work presents the development of a low- cost prototype of a miniature self- driving car model using simple and easily available technologies. The objective of the work is to avoid accidents due to driver faults. Technologies such as Pi Camera for obstacle detection and accident avoidance, computer vision for processing images and machine learning for intelligent system have been employed.**

Key Words*:*IR sensor,Arduino,Raspberry pi, pi camera

1.INTRODUCTION

Nowadays, there is growing demand of automation and intelligent systems so that it leaves us with less human intervention and smart decision making devices. With growing demand, comesthe growing competition which has forced the competitors to come out with more intelligent efficient as well as user friendly models. This has made our lives easier from making our intelligent travel arrangements. A lane detection system based on Raspberry Pi and Arduino controller is proposed with two subsystems: object detection and image processing. Image processing is used for lane detection with the camera mounted on the prototype capturing the image and image data is extracted to generate the necessary command for the obstacle detection system. This system has a disadvantage of not detecting lane accurately as the model goes little out of lane A real time traffic sign recognition system is implemented using traffic sign detection and traffic light recognition algorithms. While a u-Eye camera is used to capture images, thesystem suffers from instability with changes in ambient light

2. Methodology

This section discusses about hardware used, software development and the working of the proposed system.

A. Hardware Specifications

1. **Arduino:** Arduino is the second most important component used inprojectbecauseitprovideshugeamountofapplication.Theboardcanworkonan external supply of 6v-20. The Atmega328 has 32 kb of flash memory for storing code. All the 14digital pins onthe Arduino board can be used as an input or outputusingpinMode(),digitalWrite()&digital Read()functions.

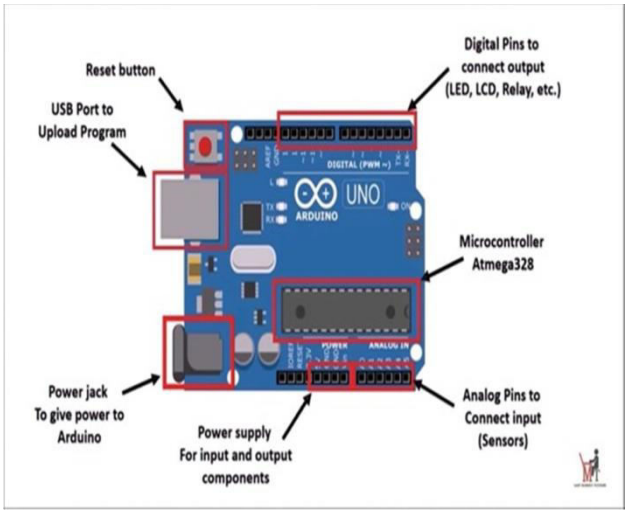


Fig.1ArduinoUNODevelopmentKit

2. Raspberry pi: It is the most important component in the project. The overall project is controlled by raspberry pi 3b. It also supports wireless internet out of the box with building WIFI and Bluetooth. It also has a added advantage of a slightly faster graphics processor. As the processing speed of camera is high, hence it is controlled by raspberry pi.

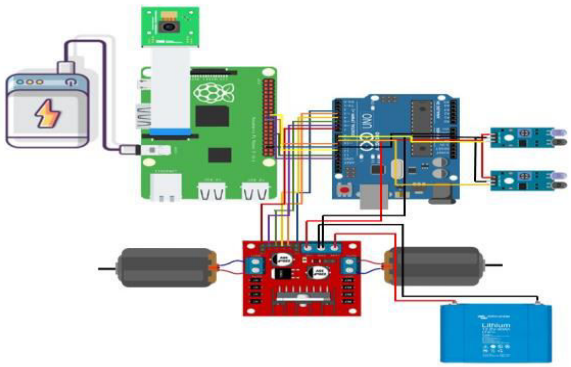
Fig2.Raspberry pi

Pi Camera:The Raspberry Pi Camera Board is a add-on module for Raspberry Pi hardware. The sensor has 5 megapixel native resolution in still capture mode. In video mode it supports capture resolutions up to 1080p at 30 frames per second. The camera module is light weight and small making it an ideal choice for mobile projects.

Fig3pi camera

Battery:A12vLithium-ionbatteryisusedtopowerupArduinoUno. A USB CABLE is used to charge up the Raspberry Pi.

3. Block Diagram



4. Circuit Diagram

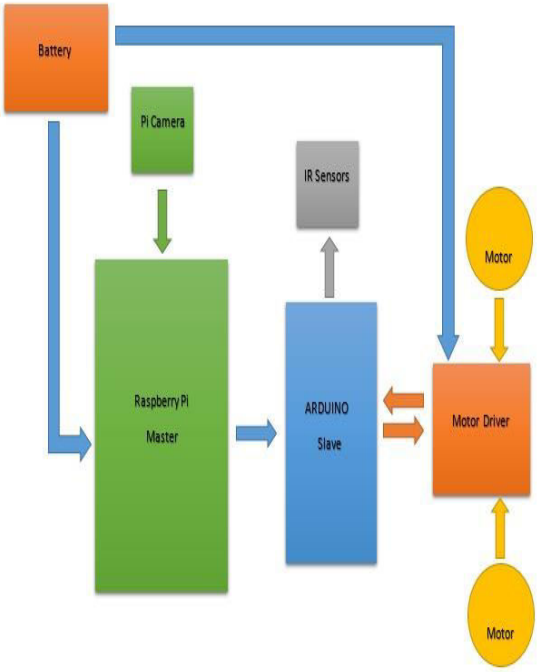


Fig4.CircuitDiagramofProject

5. Working

Raspberry is the most important component in our project. The overall project is controlled by raspberry pi 3b. It also has a added advantage of a slightly faster graphics processor. As the processing speed of camera is high, hence it is controlled by raspberry pi. The Raspberry Pi Camera Board is a add-on module for Raspberry Pi hardware Arduino uno is the second most important component of our circuit. It is used for executing the code, and it connects all the system together. It is an open source microcontroller board. As raspberry pi cannot control the overall system that's why Arduino is used to increase the efficiency of the car L298 motor driver will drive the motors and will provide power supply to motors. It also allows easy motor speed control. It easily changes the direction of a DC motor. IR Sensor detects the particular track and move accordingly.

6. Future Scope

Future scope is considered to be next generation technology because this technology is aimed at

replacing most of the present petrol power car into electric car. Artificial intelligence and Machine learning are the major for buzzword for upcoming career.We can add a GPS system in this project so that it will find its definition automatically.

7. Result

We have successfully built a self-driving car using raspberry pi and machine learning model using tensor flow. We can train more module using the same method. Lane is designed and the lane detection of the self-driving car demonstrated. The self-driving car found to be successfully detecting traffic light and responding to it as follows:

For Red – car stop , For Yellow – the car moves a bit forward and stops , For Green – the car move forward. It is demonstrated that self-driving car stops after detecting other vehicle and it over takes on its own.

A low cost prototype of a Self-Driving Car model is designed developed and all functionalities are successfully demonstrated. The car is able to follow lane efficiently using IR sensor module and the traffic colors are detected and decisions are made by the car using image processing techniques to follow real-time traffic rules.

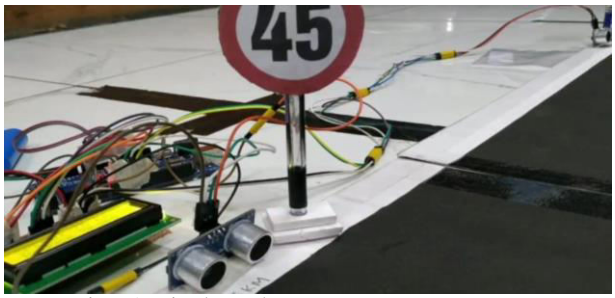


Fig.7A-Final Product

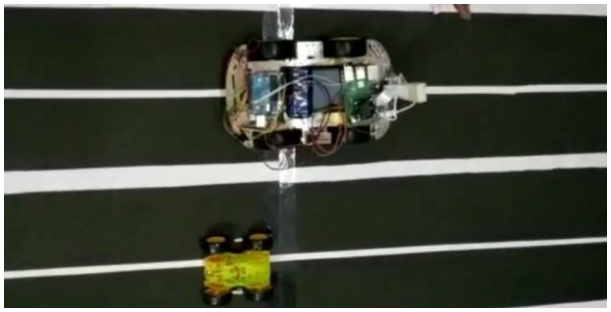


Fig.7B-Final Product

8. Conclusion

Through raspberry pi and arduino we can runour working model. This paper presented the designof an efficient, cost effective and reliable electric car. Raspberry pi andarduino was successfully tested on prototype.ThusSELF DRIVING AUTOMATIC CAR was successfully designed, implemented andtested.

9. References

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