A Prototype of Automobiles Using the raspberry Pi

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***Abstract*- We are living in an age, where everyone is looking for comfort with the help of technology. Does it anyway can affect our trips? How can we make car work on its own? Is it possible to drive a car without the drivers?**
(Self-Driving Car), Yes it is possible and we can make a car that drives on its own and intelligently senses all obstructions. It can be looked as new invention in this age of technology and prove helpful in carrying things from one place to another. The report begins defining brands in this sector. What is already in the market and their uses and scopes? How will it affect mankind at large scale? It also includes traffic solution improved dynamism, improved accident avoiding. Its role in improving havoc caused by Air pollution. With a less fuel consumption, it is all possible with this model. Wherever it is necessary images have been taken using a camera module and image correction techniques that will achieve artificial intelligence.

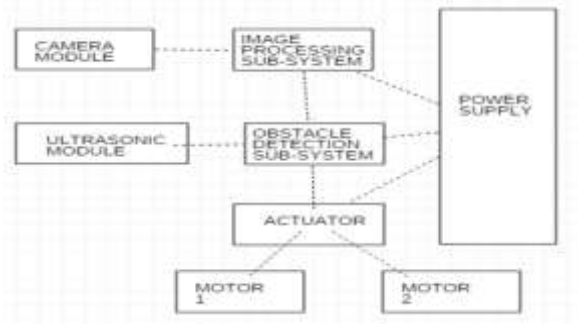
I.INTRODUCTION

Everyone in the world with improved finance nowadays owns a car. It is increasing on day to day basis and giving rise to Traffic problems. It is human tendency to break traffic rules .But a machine doesn't break rules. To prevent this, we need the intelligence driven car. Intelligence driven Car is one of the miracles of technology. It will definitely impact firms and mankind at large. Institute of Electrical and Electronics Engineers forecasted that by 2040, Self-Driven Car will be improved to 75% of the roads. Millions of people have suffered casualties of road accidents in the last decades, the purpose is to design such a car which can save millions of people every year. All these casualties happened because of Human Mistake. This fearful figure of casualties is going to increase anyhow. But we can bring AI Driven Car and change these statistics.

II. DIRECTIONS

A. Produce a drawing

Here is figure of self-driving car that shows its architecture and how they are linked to each other through data flow, as shown in the diagram there exists to further programs. These are module parts for icon usage and restriction block. A camera attached to a sub optical that captures the picture and supplies to the system. The system takes the information from pictures provided and issues instructions for action. Mostly data processing is used to find regularities in path. The outcomes refer to the irregularities identification system. The lower barrier system detects barriers in close proximity and if there is appropriate space for movement, the car forwards this instruction from Raspberry Pi to car AI Based Driver, Another instruction is overlooked

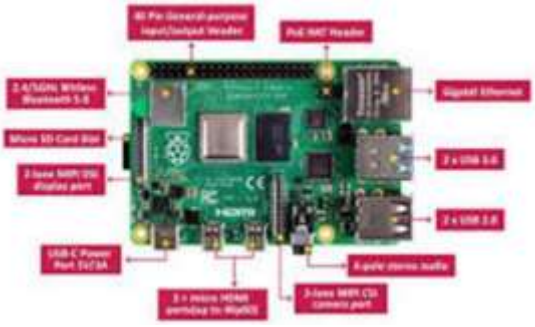


B. Local component

1. Hardware Description

Raspberry pi:

Raspberry pi the size of a small computer that has Raspbian Operating System Able to perform many tasks at once. It has a 1.5 Giga hertz quad core ARM cortex A-53 and 1 GB RAM. [1] A voltage of up to 5V, 2.5 ampere is required for the PC. [1]



Pi Camera:
For vision we have made use of 8 Mega Pixel resolution Camera with rigid lenses, which can take quality images that is of order 3280X2464 pixel image. [2]

Ultrasonic Module:
For calculating the gap of ultrasonic modules the aim is usually used because they are not impacted by any other interference. [3] The module made applicable in this project has a cycle of 40 Hertz and can scale up 10 to 400 centimeters. [4] This has symmetry of 15 Degree angle. [4]

Arduino Board:
Arduino is an open source electronics platform for devices in physical accessories and Electronic world. It can be edited in C language, it has an internal digital converter analog.

2. Software Raspbian Operating System:
There are different operating systems in this technical world, in these Arch, Reduced Instruction Set Computer Operating System, Plan 9 or Raspbian can be used in Raspberry Pi. [8] It helps in easy usage, good designs with varieties of automated and consolidated software.
It is free Raspbian-based operating system. Linux is accessible at no cost on its website. [8]

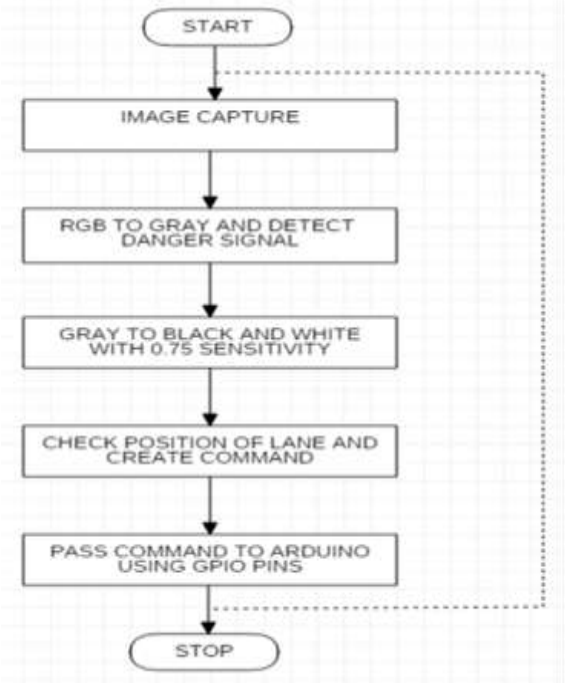
Python:
Python is one of the most user friendly language, it can code in very few lines as compared to other languages, and it is functional in nature.

GPIO Python Library:
The RPI.GPIO the Python library lets you easily configure and read-write input / output pins in Pi's
The GPIO header within the Python script [7, 9]. This package is not distributed along with Raspbian.

Open CV:
The CV stands for Computer Vision which is a library in Python for real time image perception. It has good number of algorithms, which range from shape recognition algorithm. Which even identifies humans, pointing, categorizing, and tracking of activities. The libraries make work easier with computer architecture for faster scientific utilities (9, 10).Open CV is widely utilized in Google, Honda, Yahoo, Microsoft, Intel, IBM, Sony, Toyota. Many research organizations use them. It makes use of C++ though wrappers are accessible in python too.
In this project, we identify roads and help the vehicle on unknown narrow roads. [10]

Arduino Language:
Arduino IDE based on C and C++ languages with distinct code modification rules. Arduino IDE gives a software library which is taken from Wiring Project that gives standard Input and output processes.

C. Flow Chart:
1. Image processing of the sub-system algorithm:
Here in process of looking for narrow roads algorithm in the favored area is explained below. The red marked region is our beloved area and the pillars help determine the road position and the decision to turn is decided on this. Consider the box photo taken by the camera.



The count of white pixel in every unit in reference to black pixels is numbered respectively. This number determines the vehicle command.

After Picture Study, the raspberry pi produces the instruction as explained above in block image.

These outcomes received are transmitted to arguing board via

GPIO pin .To pass the following command the table is sent.

COMMAND	GPIO pin 1	GPIO pin 2
STOP	LOW	LOW
FORWARD	HIGH	HIGH
LEFT	HIGH	LOW
RIGHT	LOW	HIGH

2. Restricted access to system subsystem

III. TEST RESULT

A. The effect of sub-system image functionality:

It is of vital importance to get Narrow roads Images from Street. And also identify their position in the shape of the pixel merge with rotation resolution.

In order to detect narrow roads it is vital to transform the picture to grayscale as explained. When the traffic is detected, the image is looks like the images below. That street with the tagged image is completely white due to photo spotting. We need to take look of only those white pixels which are in our domain of interest. The calculation of this will give positions. The beloved slide area is aligned toward the speed of the car.

B. The result of the adoption of the obstacle course:

The distance between the two components is given through the ultrasonic module. Arduino sequence communication provides impact about distance and instructs to stop the command to the car.

IV. THE BASIS AND THE FINAL WORK

A. Conclusion

Non-motorized driving aimed at the development of autonomous vehicles for ease of movement. In economics, the community and each business of this autonomous technology has brought a wide range of results. In this paper, the method determined by the marked edges of the road is described in detail is based on Open CV. Self-driving vehicles will reduce road accidents, improved energy saving. Improved production and utilization, Intelligent Drivers. Technical Advancement help improves alignments of car for road safety by completely taking in note that most accidents are caused by Human Mistakes, The algorithm used in this research was executed in a self-driven vehicle display.

B. Future work:

There is the scope of improvement in the present design with the help of Machine Learning; ML provides better algorithms which can enhance image correction algorithm. Multi-layered processors can be used for quick processing. There is scope that algorithm may not only detect obstacles but Halt also And then take another way using a higher level algorithm to detect an obstacle.

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