

Self Driving Vehicle Using Raspberry Pi

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Abstract— Human beings like enjoying their life, and that's why they invented and created the vehicles. But towards enjoying their environment, they suffer with accidents and lose valuable lives and properties. To avoid rash driving of the drivers and from accidents, the system has designed with the help of main controllers Raspberry. The Digital image processing takes major place in a road sign recognition system. Digital signal processing is used in many fields such as space exploration, medicine, geology etc. The main objective of this system is to demonstrate the ability of image processing.

Keywords: Raspberry Pi, Image Processing, Automation, K nearest Algorithm

I. INTRODUCTION

There are four types of traffic signs that are shown in the traffic code:

- Warning;
- Prohibition;
- Obligation;
- Informative.

Depending on the form and the color, the warning signs are equilateral triangles with one vertex upwards. They have a white background and are surrounded by a red border. Prohibition signs are circles with a white or blue background and a red border. Both warning signs and prohibition signs have a yellow background if they are located in an area where there are public works. To indicate obligation, the signs are circles with a blue background. Traffic sign recognition also gets an immense interest lately by large scale companies driven by the market needs for intelligent applications such as autonomous driving, driver assistance systems (ADAS), mobile mapping etc.

II. PROPOSED SYSTEM

The proposed system provides a Self Driving Vehicle feature to any existing electric car on road that doesn't has autonomous driving feature inbuilt within it. Most existing electric cars that are on roads don't have this technology and this is mostly found in new and expensive cars.

III. BLOCK DIAGRAM

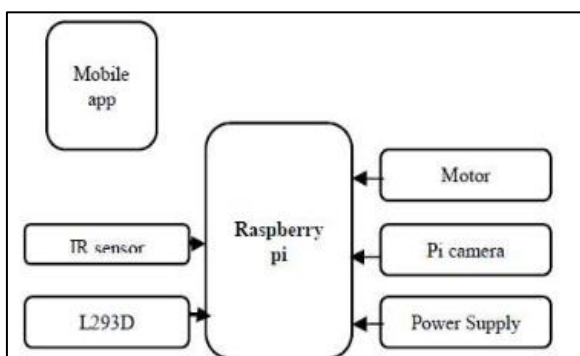


Fig.1: Self Driving Vehicle Using Raspberry Pi

IV. HARDWARE AND SOFTWARE

A. Raspberry Pi

The Raspberry Pi is a credit card sized, single board computer developed in the UK by the Raspberry Pi Foundation. The Raspberry Pi has a Broadcom BCM2835 System on a Chip (SoC), which includes an ARM1176JZF-S 700 MHz processor. It has an internal storage of 512 MB, external storage supported up to 32 GB, 1 Ethernet port, 4-2.0 USB ports, 1 micro SD card slot, DSI display connector, 1 HDMI out port, 1 CSI Camera connector, 5V USB power, RCA. The Raspberry Pi2 B model CPU is of ARM 11 family operates at 700MHz. The GPU having general-purpose (GPIO) compute. It operates on 1mA at 5V power supply. With the help of GPIO pins Broadcom Video core-IV, open GLES 2.0, 1080p30, H.264/MPEG-4, AVC high profile decoder and capable of 1Gpixel/s, 1.5 G Texel/s (or) 40 GFLOPs of we can control the devices from any place.

B. USB Camera

USB camera's or imaging camera's that use UBB 2.0 or 3.0 technology to transfer image data. USB cameras are designed to easily interface with dedicated computer systems by using same USB technology that is found on most computers. The accessibility of USB technology in computer systems as well as the 480Mb/s transfer rate of USB 2.0 makes USB camera's ideal for many imaging applications.

C. Motor

A DC electric motor that divides a full rotation into number of equal steps is used. The motor's position can then be commended to move and hold at one of these steps without any feedback sensor, as long as the motor is carefully sized to the application in respect to torque and speed.

D. L293D

A motor driver is an integrated circuit chip which is usually used to control motors in autonomous robots. Motor driver act as an interface between Arduino and the motors. These ICs are designed to control 2 DC motors simultaneously. L293D consist of two H-bridge. L293D has 16 pins.

E. Python

Python is an interpreted high-level programming language for general purpose programming created by Guido van Rossum and first released in 1991; Python has a design philosophy that emphasizes code readability, notably using significant whitespace. It provides constructs that enable clear programming on both small and large scales.

F. MySQL

MySQL is an open source relational database management system based on Structured Query Language (SQL). MySQL, which was originally conceived by the Swedish

company MySQL AB, was acquired by Sun Microsystems in 2008 and then by Oracle when it bought Sun in 2010.

V. RESULT

Driverless cars promise to greatly reduce the occurrence of both risks, as well as accidents involving pedestrians. The result is that the cost of insurance will collapse as it is associated with human driving and is eliminated by this technology.

VI. ADVANTAGES

Safety issues have the most serious impact on daily life out of all the transportation problems. Traffic accidents have colossal negative effects on economy. Traveling by car is currently the most deadly form of transportation, with over a million deaths annually worldwide. For this reason, the majority of the research projects in the transportation sector concentrate on developing safety systems. Implementation of autonomous vehicles can greatly reduce the number of crashes, since 90 percent of the traffic accidents are caused by human error.

VII. CONCLUSION

In this paper, the different hardware components and their assemblies are described. The software can recognize and record the traffic sign. It uses camera to calculate exactly or using probabilities, the position of the car on the road, where the roadsides are and propose a new direction even in the absence of traffic signs for the next seconds. Autonomously Tracking and detecting of object is used for motion detection of various objects. The application of tracking and object detection is farming, military, transportation, civil, security and for commercial use. Autonomous car provide independent mobility to non-drivers, reduce the stress and tedium of driving.

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