

Prototype of Computerized driverless vehicle

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Abstract - In manufacturing Industries the use of Transport Vehicle used to carry the goods, materials from one place to another needs the manpower for driving the vehicle, also there is a need to provide safety for the Driver, and the Natural Energy Sources such as Petrol, Diesel etc. are used for combustion and operation of the vehicle.

In such situations the human safety and the Manpower needed is large. Hence, the use of this Computerized Vehicle may prevent the Loss of Natural Energy Sources such as Petrol, Diesel etc. as the vehicle uses Electric Power and stores the power in battery for operation, also the excess manpower needed may be minimized at a certain level and most importantly as the operator does not need to operate the Vehicle moving with it, and can control the vehicle as same as of driving, sitting at a control room which would be far placed and the distance of approx. 200m(Wi-Fi & Zeeg Bee Sensor). The standard distance of operation of the vehicle may be upgraded by upgrading the needed Hardware Equipment.

1. INTRODUCTION

Major crises of fuel consumption, pollution problems, sudden death of humans in accidents, heavy transportation done daily of goods such as metals, hazardous chemicals in massive amount. Industrialists must have to pay compensation to any worker which died during any kind of accidents and Workman compensation act. No matter how dangerous it would be any place to surveillance, soldiers have must go there and perform their duties. So many died while doing such kind of surveillance on a country border. Prototype of computerized driver-less vehicle is a totally driverless in which there is no need to any kind of person who drives it. This vehicle controls from a controller who is very far from it. Because of prototype model this whole communication is conducted within a range of Wi-Fi using TCP-IP protocol. This protocol is very reliable and contains a negligible latency. If there is no any person present is a car then how controller would know that where car is going? That's why we uses a web cam which streams a live video to the controller's side. Our vehicle is not fully automated due to this the chances of failures are become zero. Focuses at fuels crisis we made this car electrically runnable. All the power supply of car comes from a Electric battery.

The agricultural farming industry is facing significant challenges at present. The global competition for a higher productivity in the agriculture has made demands on more automation in the machinery and more cooperation between agricultural machines. The decreasing number of farming labour force and the higher labour costs in the agricultural industry is a significant issue for the Indian agriculture. As a response to mechanized and site-specific farming, more and more GPS-guidance is utilized in modern farming to meet the demands on precision agriculture and has made possible to guide the agricultural vehicles autonomously. For example, with the commercial real-time kinematic (RTK) GPS systems the accuracy of the positioning can reach 1-2cm per 10km.

2. PROBLEM DEFINITION

What is Problem ?

1. Consumption of excessive amount of fuels during transportation.
2. Loss of human lives in case of accidents.
3. In Defence there is threat to soldier in Danger zones.
4. Handicapped People are dependent on another one.
5. Unavailability of Man power in farming.

Problem Solution:

1. Vehicle is Remotely Controlled.
2. Driverless Vehicle.
3. Vehicle is not using fuel like Petrol and Diesel.
4. Very much Environmental Savvy.

3. PROJECT SCOPE

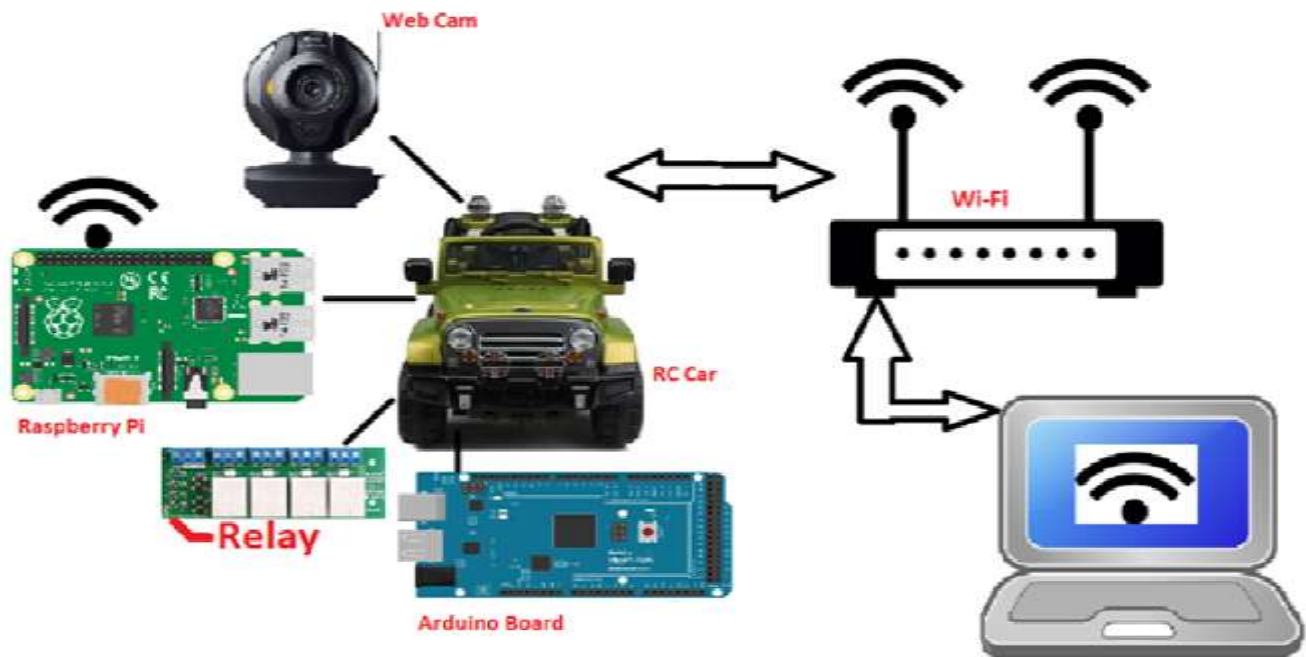
We can implement this system on a real vehicle. We can add more sensors like ultrasonic sensor to measure a distance. In this system we can implement AI to read road signs and act accordingly on the environment. Add more camera so we can get multidirectional view. Add

RF sensors for long range connectivity for areas like

manufacturing

industries.

3. SYSTEM ARCHITECTURE



[1] Raspberry Pi v.3 B

Raspberry Pi 3 Model B is the newest mainline Raspberry Pi. Raspberry Pi boards are priced between US \$5–35 on Feb 2014. It has 1.2 GHz 64 bit quad-core processor and also inbuilt Wi-Fi and Bluetooth as compare to later versions.

Technical specification:

1. A 1.2GHz 64-bit quad-core ARMv8 CPU
2. 802.11n Wireless LAN
3. Bluetooth 4.1
4. Bluetooth Low Energy (BLE)
5. 1GB RAM
6. 4 USB ports
7. 40 GPIO pins
8. Full HDMI port
9. Ethernet port
10. Combined 3.5mm audio jack and composite video
11. Camera interface (CSI)
12. Display interface (DSI)
13. Micro SD card slot (now push-pull rather than push-push)
14. Video Core IV 3D graphics core

[2] Arduino UNO

Arduino Uno is a microcontroller board based on the ATmega328P . It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 Analog

inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Technical specification:

1. Micro-controller: ATmega328P
2. Operating Voltage : 5V
3. Input Voltage (recommended): 7-12V
4. Input Voltage (limit) : 6-20V
5. Digital I/O Pins : 14 (of which 6 provide PWM output)
6. PWM Digital I/O Pins : 6
7. Analog Input Pins : 6
8. DC Current per I/O Pin: 20 mA
9. DC Current for 3.3V Pin : 50 mA
10. Flash Memory : 32 KB (ATmega328P)of which 0.5 KB used by boot loader
11. SRAM : 2 KB (ATmega328P)
12. EEPROM : 1 KB (ATmega328P)
13. Clock Speed : 16 MHz
14. LED_BUILTIN: 13

[3] 12V 4-Channel Relay Board

The 4 channel Relay Board can be used to turn lights, fans and other devices on/off while keeping them isolated from your microcontroller. Relay's coil voltage is

12V, so you can use directly with any 12V regulator. This Relay Board allows you to control high-power devices (up to 10 A) via the on-board relay. Control of the relay is provided via a 1 x 3 header – friendly to servo cables and convenient to connect to many development boards.

[4] Web camera /Pi-camera

A webcam – short for ‘web camera’ – is a digital camera that’s connected to a computer. It can send live pictures from wherever it’s sited to another location by means of the internet. Many desktop computer screens and laptops come with a built-in camera and microphone, but if yours doesn’t, you can add a separate webcam at any time.

4. ADVANTAGES

- Vehicle is remotely controlled.
- Driverless vehicle.
- Vehicle is not using fuels like Petrol and Diesel.
- Very much Environmental Eco friendly.

5. CONCLUSION

As per our observation we conclude that our vehicle run as per user commands only even in worst condition also. It never disobeys user's order. Whatever commands are given to car no matter how difficult or how fast it was our vehicle always perform as per we designed it.

No matter what condition is the car is very easy to handle. On any kind of surface and at any turning point it will become very soft due to controls we provide to it.

On all kind of terrains and all kind of roads the vehicle can run very smoothly. We personally tested some kind of conditions such as mountains and valleys where car can run perfectly.

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