



Bluetooth Remote Controlled Car and Drowsiness Detection Glasses using Arduino

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November 11, 2019

Bluetooth Remote Controlled Car and Drowsiness Detection Glasses using Arduino

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***Abstract :** In present scenario we are very much dependent on digitalized machines. Automatic controlled machines in our daily life are very much preferred rather than manually controlled machines. Transport is one of the most essential things in our daily life. But it is impossible to drive a four wheeler car without knowing proper driving. From that aspect, our project will help a layman to control the vehicle without knowing driving, but just sitting inside it. It will also enhance the security, accidental emergency and many more problems to solve.*

I. INTRODUCTION :

Our project is based on developing an electric vehicle which can be operated by a mobile device connected via bluetooth. The description of the used components are as follows,

ARDUINO UNO : The 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 AC-to-DC adapter or battery to get started. You can tinker with your UNO

without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again. "Uno" means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now devolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards.

ARDUINO NANO : The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino Nano 3.0) or ATmega168 (Arduino Nano 2.x). It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one. The Nano was designed and is being produced by Gravitech. Arduino Nano 2.3 (ATmega168): manual (pdf), Eagle files. Note: since the free version of Eagle does not handle more than 2 layers, and this version of the Nano is 4 layers, it is published here unrouted, so users can open and use it in the free version of Eagle. The Arduino Nano can be powered via the Mini-B USB connection, 6-20V unregulated external power supply (pin 30), or 5V regulated external power supply

(pin 27). The power source is automatically selected to the highest voltage source. The FTDI FT232RL chip on the Nano is only powered if the board is being powered over USB. As a result, when running on external (non-USB) power, the 3.3V output (which is supplied by the FTDI chip) is not available and the RX and TX LEDs will flicker if digital pins 0 or 1 are high.

MOTOR DRIVER : It is a high voltage, high current dual full-bridge driver designed to accept standard TTL logic levels and drive inductive loads such as relays, solenoids, DC and stepping motors. Two enable inputs are provided to enable or disable the device independently of the input signals. The emitters of the lower transistors of each bridge are connected together and the corresponding external terminal can be used for the connection of an external sensing resistor. An additional supply input is provided so that the logic works at a lower voltage.

BLUETOOTH MODULE : Bluetooth is a wireless technology standard for exchanging data over short distances (using short wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices, and building personal area networks (PANs). Range is approximately 10 Meters (30 feet). These modules are based on the Cambridge Silicon Radio BC417 2.4 GHz Bluetooth Radio. This is a complex chip which uses an external 8M bit flash memory.

ULTRASONIC SENSOR : The HC-SR04 is an inexpensive, easy to use distance sensor, with a range of 2 to 400cm. It is commonly used in obstacle avoiding robots and automation projects. Ultrasonic sensors work by emitting sound waves with a frequency that is too high for a human to hear. These sound waves travel through the air with the speed of sound, roughly 343 m/s. If there is an object in front of the sensor, the sound waves get reflected back and the receiver of the ultrasonic sensor detects them. By measuring how much time passed between sending and receiving the sound waves, the distance between the sensor and the object can be calculated.

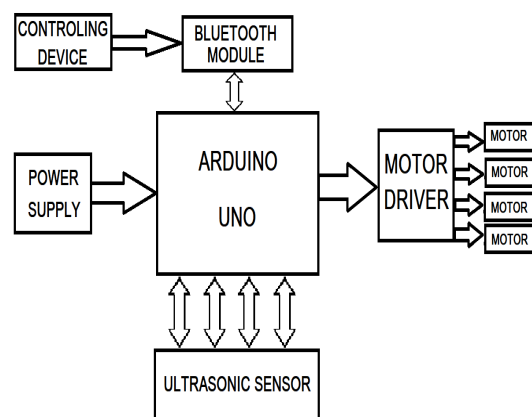
EYE BLINK SENSOR : The eye-blink sensor works by illuminating the eye and eyelid area with infrared light, then monitoring the changes in the reflected light using a phototransistor and differentiator circuit. The exact functionality depends greatly on the positioning and aiming of the emitter and detector with respect to the eye.

PIEZO BUZZER : A "piezo buzzer" is basically a tiny speaker that you can connect directly to an Arduino. ... From the Arduino, you can make sounds with a buzzer by using tone. You have to tell it which pin the buzzer is on, what frequency (in Hertz, Hz) you want, and how long (in milliseconds) you want it to keep making the tone.

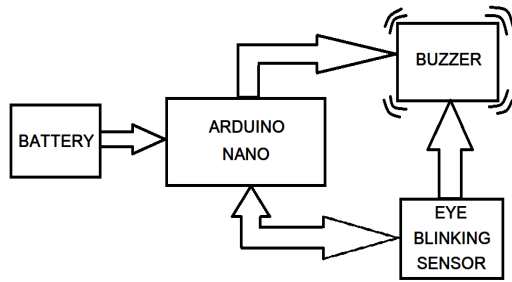
WEBCAM : A webcam is a small digital video camera directly or indirectly connected to a computer or a computer network. Webcams come with software that needs to be installed on the computer to help users record video on or stream it from the Web. Webcams are capable of taking pictures as well as high-definition videos, although the video quality can be lower compared to other camera models. Webcams are also known as Web cameras.

II. BLOCK DIAGRAM:

ARDUINO BASED ELECTRIC CAR :



SAFETY GLASSES FOR USER DROWSINESS:



III. **OBJECTIVE :**

This project is an Arduino based electric car, including a pair of safety glasses to detect user drowsiness. The remote in this car will be a controlling device which is having an inbuilt Bluetooth module. For android devices, we will be using 'Bluetooth Robo Control' Application. The Bluetooth is a serial communication medium through which we can connect two devices. Here we have inserted a Bluetooth module in the Arduino Board which gets connected to the device's Bluetooth, that allows us to communicate and to take command over it. The Bluetooth module does not work on its own in controlling the car. The main part in controlling the car is played by the Arduino uno which houses the micro-controller ATMEGA32. The arduino uno takes command from the connected device and gives them to the motor driver. The motor driver is connected with four motors, hence the motor driver operates the car. The Arduino uno is also connected with four ultrasonic sensors, attached with the car body. The sensors send ultrasonic waves which reflects on the surface of any object nearby and then receives the waves. Thus the sensors can sense nearby obstacles with the distance and informs the user if it is too close. There are four LED lights connected with the sensors which blink if there is any object within the pre determined danger range. There is a webcam attached in front of the car with live video streaming, which helps the user to observe what's happening in front of the car to avoid accident.

The safety glasses works based on Arduino Nano. The arduino nano board is attached with the glasses. An eye blinking sensor is connected with the board. This sensor illuminates the eye and eyelid area with infrared light, and monitors the changes in the reflected light using a phototransistor and differentiator circuit. When the sensor detects any drowsiness or if the eyelids of the user are closed, then the attached buzzer will notify the user. The buzz timing is set on two seconds after detection. Thus the glasses will help to wake up the user if drowsiness is detected.

IV. **CONTRIBUTION :**

The main motto of our project is to help the people who do not know how to drive or who are physically disabled. The user can operate the vehicle by sitting on the backseat. The live video streaming using the webcam will help the user to observe whatever happening in front of the car. While facing any kind of medical emergencies, the patient will be able to lie down and operate the car by his own and reach to the hospital. Any person who cannot drive properly or have difficulty using the steering and gear function, can sit on the backseat and control the car with his own mobile phone easily. The ultrasonic sensors are there to help whenever there are any other obstacles approaching this car. These will also help the user while parking the car. These pros will help to reduce the number of road accidents happening. And most importantly, this electric vehicle will help the society to prevent pollution.

For long journeys, the user may feel sleepy or drowsy due to long period of driving. The safety glasses are there to help the user prevent drowsiness. Whenever the user will feel sleepy and drowsy, the system will inform and wake the user up by buzzing. This will be a great help while driving at night. And this will also help to prevent road accidents a lot. Not only that, these glasses will also help people who are differently abled to notify or inform us via eye blinking.

V. *CONCLUSION :*

The Arduino is an open source device that has been the brain for numerous projects. The Arduino has everything that is required by the user which includes its inbuilt converter, i/o pins etc. With the combination of Arduino, and the Bluetooth Shield we can control over many other things, like home Lightings, air conditioner and many more through our cell phones. The Arduino can also contribute at large for the SmartHome system. By doing this Project we found out a lot about the Arduino, and how it has made us easier to convert digital signals into physical movements. One more advantage of Arduino is that once a program is burned we don't need to worry about the program getting erased as long as it is not RESET. Arduino has also over all other microcontroller because of its efficiency and user friendly property.

VI. *REFERENCE :*

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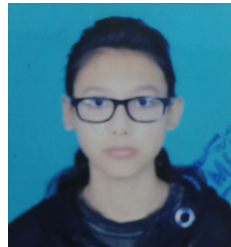
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