Portable Roadside Sensors for Vehicle Counting, Classification, And Speed Measurement

[1] Kolukulapally Ramesh
Mail: rameshkolukulapally94@gmail.com
Master of Technology
Annamacharya Institute of Technology and Sciences, Blatasingaram, Hayat Nagar, Rangareddy District, Hyderabad, Telangana-500075.

[2]Mr. P. Rajeshwar
Email: rajpakala05@gmail.com
Asst. Professor, M.Tech,
Annamacharya Institute of Technology and Sciences, Blatasingaram, Hayat Nagar, Rangareddy District, Hyderabad, Telangana-500075.

Abstract:

This Project focuses on the development of a portable roadside magnetic sensor system for vehicle counting, classification, and speed measurement. The earliest magnetic field detectors allowed navigation over trackless oceans by sensing the earth's magnetic poles. Magnetic field sensing has vastly expanded as industry has adapted a variety of magnetic sensors to detect the presence, strength, or direction of magnetic fields not only from the earth, but also from permanent magnets, magnetized soft magnets, vehicle disturbances, brain wave activity, and fields generated from electric currents. Magnetic sensors can measure these properties without physical contact and have become the eyes of many industrial and navigation control systems. This paper will describe the current state of magnetic sensing within the earth's field range and how these sensors are applied. Several applications will be presented for magnetic sensing in systems with emphasis on vehicle detection and navigation based on magnetic fields.

The IR transmitter and receiver are mounted on the both sides of the highway such that the rays from transmitter fall on the receiver. When a vehicle passes through IR system, it acts as an obstacle between transmitter and receiver sections .This will be fed to the microcontroller which counts the number of vehicles as well as speed of the vehicles and displays on LCD. And this project can classify the vehicle using 3 LDR sensors arranged at road side and then this status will update to traffic unit through IOT (Internet of things), here ARM7 Microcontroller is programmed using Embedded C language.

Keywords

Elliptic curve cryptography (ECC), Biometrics, RFID, Embedded system, Low Cost, High protection.

1. Introduction

The appearance of new rapid innovation and the developing PC Capacity gave reasonable chance to new robot controls and acknowledgment of new strategies for control hypothesis. This specialized change together with the requirement for superior robots made speedier, more exact and smart robots utilizing new robots control gadgets, new drives and propelled control calculations. This venture depicts another efficient arrangement of robot control frameworks. The introduced robot control framework can be utilized for various refined robot applications.

This Project "Portable Roadside Sensors for Vehicle Counting Classification and Speed Measurement" is utilized to control the Robot which is comprised of DC engines. It will advance either in, in reverse or Left, Right. The foreordained guidelines are as of now stacked in to the ARM-7 LPC2148 microcontroller by Using Embedded C Programming. All the above procedures are controlled by the ARM-7 LPC2148 microcontroller.

The primary point of this task is to identify the individual by utilizing the remote controlled Robot, which have the sensors that recognizes the nearness of the person and demonstrates the client. As it is a remote Robot it can be effectively assembled and can be controlled. This can be utilized to distinguish psychological oppressors/hoodlum inside the building.

In this undertaking we utilize miniaturized scale controller, which is modified to control the info and yield modules interfaced to it. The controller makes utilization of a PIR based information sensor to detect the person and give us a ready sign. We likewise make utilization of a remote, which is utilized to control the robot.

The venture comprises of miniaturized scale controller based motherboard is available with the Robot itself. It is interfaced with some DC engines for moving the robot, a PIR sensor for human nearness discovery, and a zigbee for accepting the directions from the remote.

This task uses two DC Motors separately. The DC engine produces torque specifically from DC control provided to the engine by utilizing inner recompense, stationary perpetual magnets, and turning electrical magnets. It takes a shot at the standard of Lorentz compel, which expresses that any current conveying conductor set inside an outside attractive field encounters a torque or

power known as Lorentz drive. Favorable circumstances of a brushed DC engine incorporate low starting cost, high unwavering quality, and straightforward control of engine speed. Detriments are high support and bastard traverse for high power employments.

Support includes frequently supplanting the brushes and springs which convey the electric current, and in addition cleaning or supplanting the commutator. These segments are vital for exchanging electrical power from outside the engine to the turning wire windings of the rotor inside the engine.

The driver utilized for DC Motors is L293D. The Device is a solid incorporated high voltage, high flow four channel driver intended to acknowledge standard DTL or TTL rationale levels and drive inductive burdens, (for example, transfers solenoids, DC and venturing engines) and exchanging power transistors. This task makes utilization of a small scale controller, which is modified, with the assistance of implanted C guidelines. This ARM-7 LPC2148 microcontroller is equipped for speaking with information and yield modules. The controller is interfaced with dc engines, which are settled to the Robot to control the course of the Robot.

An installed framework is a blend of programming and equipment to play out a committed undertaking. A portion of the principle gadgets utilized as a part of implanted items are Microprocessors and ARM-7 LPC2148 microcontrollers.

Microchips are usually alluded to as broadly useful processors as they just acknowledge the sources of info, process it and give the yield. Conversely, an ARM-7 LPC2148 microcontroller acknowledges the information as contributions as well as controls it, interfaces the information with different gadgets, controls the information and in this manner at last gives the outcome.

LPC2148 microcontroller is a selective undertaking that can move the robot as indicated by the guidelines given by the above said ARM-7 LPC2148 microcontroller.

The framework has camera which is settled to the Robot, this venture empowers the client to catch the picture toward any path utilizing a remote camera which is associated with a robot that can move with the speed and heading indicated by the client

2. Project Design

In this project the block diagram of the task and design thing of unbiased modules are considered. Block diagram is proven in figure:
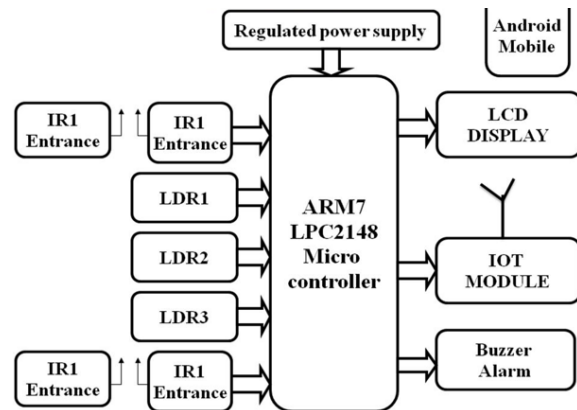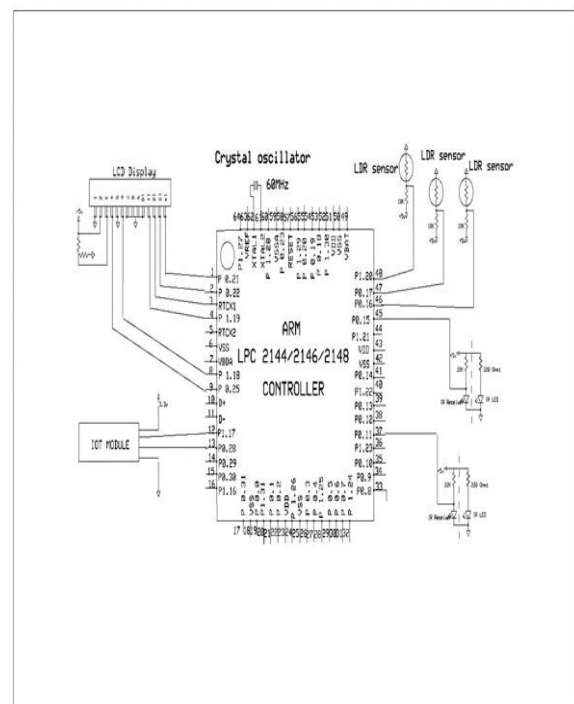

Figure 1: Block Diagram of the Project

Figure 2: Schematic Diagram of the Proposed Design

The above schematic diagrams of both transmitter and receiver sections of PIR based live human being detection ROBOT using RF Explains the interfacing section of each component with ARM-7 LPC2148 micro controller and PIR sensor module.

Advantages:

1. Detection of human presence using PIR sensor.
2. Wireless controlling of robot using RF.
3. Fast response.
4. Efficient and low cost design.
5. Low power consumption.

Disadvantages:

1. PIR sensor takes delay of some time to sense the presence of a person, when switched on.

2. PIR sensor doesn't respond, if the person is in standby condition (no movement).

3. Limited distance.

Applications:

1. Can be used to detect persons in restricted areas.

2. Can be used in mines.

3. Can be used to detect terrorists in buildings.

The project was planned with the end goal that the robot can be worked utilizing RF innovation and the PIR sensor recognizes the human nearness and when the nearness of human was being distinguished it stops and signals a caution framework.

3. Conclusion

Coordinating highlights of all the equipment parts utilized have been created in it. Nearness of each module has been contemplated out and set painstakingly, accordingly adding to the best working of the unit. Besides, utilizing exceptionally propelled IC's with the assistance of developing innovation, the venture has been effectively actualized. In this way the venture has been effectively composed and tried.

4. Future Scope

Our task "PORTABLE ROADSIDE SENSORS FOR VEHICLE COUNTING CLASSIFICATION AND SPEED MEASUREMENT" is mostly expected to distinguish people by a robot. This task has a PIR sensor, RF innovation to control the robot remotely and a robot which are interfaced to the ARM-7 LPC2148 miniaturized scale controller. The small scale controller is customized such that the robot can be worked utilizing RF innovation and the PIR sensor identifies any human nearness in its way and if any human nearness is being distinguished it stops and ringers an alert framework.

This undertaking can be broadened utilizing ZigBee innovation, which increments working remote separation. Additionally a camcorder can be utilized get the photographs of the individual being identified.

In future we can utilize this task in a few applications by adding extra parts to this extend.

By interfacing remote camera to the robot, at that point we can see the external world from our PC just by utilizing GPRS and GPS. We can utilize this robot at such a large number of fields and we can use to deal with such a significant number of circumstances.

By associating bomb finder to the robot, we can send it to anyplace i.e (front line, woodlands, coal mines, to wherever) by utilizing our PC and we can ready to distinguish the bomb at field, here sensor identifies the bomb and offers data to miniaturized scale controller and it gives the data to handset and it sends the data to the PC.

By associating temperature sensor to the robot we can get the temperature of perilous zones in PC itself as opposed to sending human to there and confronting issues at field we can send robot to there and sensor will recognize the temperature and it offers data to the smaller scale controller and miniaturized scale controller gives the data to the handset from that we can get the information at pc side. By associating smoke sensor to the robot we can get the data related centralization of smoke or gasses in individual field's i.e. (coal mines, unsafe zones, and so forth). Sensor sense the data and it provide for the miniaturized scale controller and it provides for the handset and from that we get the data in PC.

By associating relating instruments to the robot we can utilize it in horticulture for cultivating reason. This robot can propel either and in reverse and left and right rely on our guidelines so we can do some piece of farming from pc just by utilizing robot.

By interfacing terminating instrument and remote camera to the robot we can fire the objective from pc. Here by utilizing camera we can see the inverse target and we can fire the objective from PC by squeezing chose catch and we can undoubtedly deal with the circumstances like Mumbai psychological oppressor's assault without loss of human life's and we can diminish our troopers exertion as well.

5. References

The sites which have been used whilst doing this task:

1. Www.Wikipedia.Com

2. Www.Allaboutcircuits.Com

3. Www.Microchip.Com

4. Www.Howstuffworks.Com

Books Referred:

1. Raj kamal -Microcontrollers Architecture, Programming, Interfacing and System Design.

2. Mazidi and Mazidi -Embedded Systems.

3 PCB Design Tutorial -David.L.Jones.

4. Microcontroller Manual - Microchip.

5. Embedded C -Michael.J.Pont.

Student:

Guide: