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Smart Featured Vehicle for Smart City

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ABSTRACT

Automated guided vehicle system (AGVS) are widely used for transporting material in manufacturing and warehousing applications. These systems offer many advantages over other forms of material transport .However the design of these systems is complex due to the interrelated decisions that must be made and the large number of system design alternatives that are available

Here we introducing a smart vehicle with features of transporting large amount of materials of various industries in one vehicle. The vehicle is designed with RFID sensor and consists the IP address of particular industry or location.

One more feature of that smart vehicle is a sensor system for protecting the door of a vehicle from damage includes an electronic sensor operable to detect when object external to the vehicle which is closer to the door of the vehicle. The sensor system provides a signal indicative of the closer vehicle to the external object .It also includes a blocking hinge mechanism coupled with the signal. It blocks the opening of the door beyond a distance where the vehicle door would strike the object.

The lighting system of a vehicle consists of lighting and signaling devices mounted to the front rear, sides and in some case the top of a vehicle. This lights the roadways for the drivers and increases the visibility of the vehicle allowing other drivers to see a vehicle's presence, position, size, direction of travel and drivers intensions towards the directions and speed of travel. Emergency vehicles usually carry distinctive lighting equipment to warn drivers and indicate priority of movements in traffic.

Nowadays the drivers are facing accidents at road turnings, there is a chance of under steering or over steering of the vehicle. By using TILT sensor at the vehicle's engine will slow down and the friction will be applied to the breaks so the drivers can control the vehicle.

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I. INTRODUCTION

PRESENT SCENARIO:

- Vehicles from different companies will deliver goods and services by heavy transportation. This may causes air pollution, fuel consumption, over traffic.
- The most common sever night accidents occur when the head lamp focusing of both opposite vehicles is high.
- While travelling through high ways, the major accidents occur at the U turns and long turns.

PROPOSED SYSTEM:

- A smart vehicle which is used to transport large number of materials from industries to their required destination.
- In order to avoid night accidents due to head lamp focusing of opposite vehicles,by using sensors we are providing LED's to decrease the focus of light from opposite vehicle.
- At over turnings the vehicle's engine will slow down and the friction will be applied to the required wheel for the driver to control.

OBJECTIVE:

Reliable smart vehicle and energy conservation system is the proposed project that is planned and is set to perform the following tasks.

- The usage of more number of trucks for delivering goods causes pollution issue, over traffic .For this we are using separate vehicle with number of trolleys along with RFID tags are processed by Arduino MC to leave the trolleys to their respective locations of a company.
- The identification of the opposite objects is done by input source ultrasonic sensor and the respected LED's of headlamps will switch ON and OFF. The head lamp intensity will be minimized based on the position of vehicles.
- In order to control the over steering and under steering problem, by using TILT sensors we can identify the turns and the controller will process the data to slow down the engine and breaks will be apply to required wheel by the concept of dynamic stability control.

MOTIVATION OF WORK:

In our day to day life we are using vehicles in each and every field so many lives are spoiled due to accidents. To avoid this we are implementing the smart

vehicle it reduces the accidents.

- It is an advanced system to deliver the goods through RFID tags.
- It avoids accidents during night times by using the automatic LED headlamps.
- It also avoids the crashes at U-turns.

ADVANTAGES:

- It avoids clashing of vehicle in U-turns and avoids night accidents.
- Less skilled technicians can also operate it very easily.
- This smart vehicle can prevent accidents.

Avoids over traffic.

DISADVANTAGE:

- Maintenance and repair cost is high.
- Designing of circuit is complex.

APPLICATIONS:

- Four wheeler applications.
- It is also used in two wheeler applications.
- Heavy load transportations.

INDIVIDUAL BLOCK DESCRIPTION:

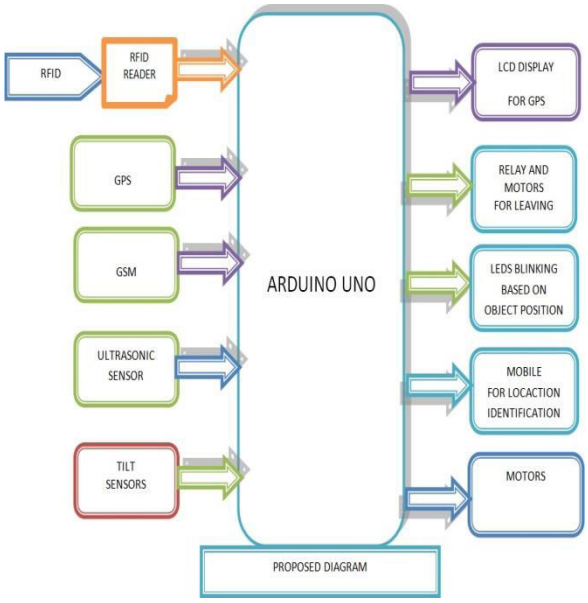
This project mainly consists of RFID Readers, Arduino, GPS, Ultrasonic sensors, Tilt sensors, LCD display, Electromagnetic materials, Motor drivers and Motors.

RFID READERS:

A radio frequency identification reader (RFID reader) is a device used to gather information from an RFID tag, which is used to track individual objects. Radio waves are used to transfer data from the tag to a reader. However, the RFID tag does not have to be scanned directly, nor does it require line-of-sight to a reader. The RFID tag it must be within the range of an RFID reader, which ranges from 3 to 300 feet, in order to be read. RFID technology allows several items to be quickly scanned and enables fast identification of a particular product, even when it is surrounded by several other items.

GPS:

Stands for "Global Positioning System." GPS is a satellite navigation system used to determine the ground position of an object. Today, GPS receivers are included in many commercial products, such as automobiles, smart phones, exercise watches, and GIS devices.. A GPS receiver combines the broadcasts from multiple satellites to calculate its exact position using a process called triangulation. Three satellites are required in order to determine a receiver's location, though a connection to four satellites is ideal since it provides greater accuracy.



ULTRASONIC SENSORS:

Ultrasonic sensors are used to detect the presence of targets and to measure the distance to targets in many robotized processing plants and process plants. Sensors with an ON or OFF digital output are available for detecting the presence of objects and sensors with an analog output which changes relatively to the sensor to target separation distance are commercially available. Ultrasonic obstacle sensor consists of a set of ultrasonic

receiver and transmitter which operate at the same frequency. The point when the something moves in the zone secured the circuit's fine offset is aggravated and the buzzer/alarm is triggered.

TILT SENSORS:

Tilt sensors are devices that produce an electrical signal that varies with an angular movement. These sensors are used to measure slope and tilt within a limited range of motion. Sometimes, the tilt sensors are referred to as inclinometers because the sensors just generate a signal but inclinometers generate both readout and a signal.

LCD DISPLAY:

LCD (liquid crystal display) is the technology used for displays in notebook and other smaller computers. Like light-emitting diode (LED) and gas-plasma technologies, LCDs allow displays to be much thinner than cathode ray tube (CRT) technology. LCDs consume much less power than LED and gas-display displays because they work on the principle of blocking light rather than emitting it.

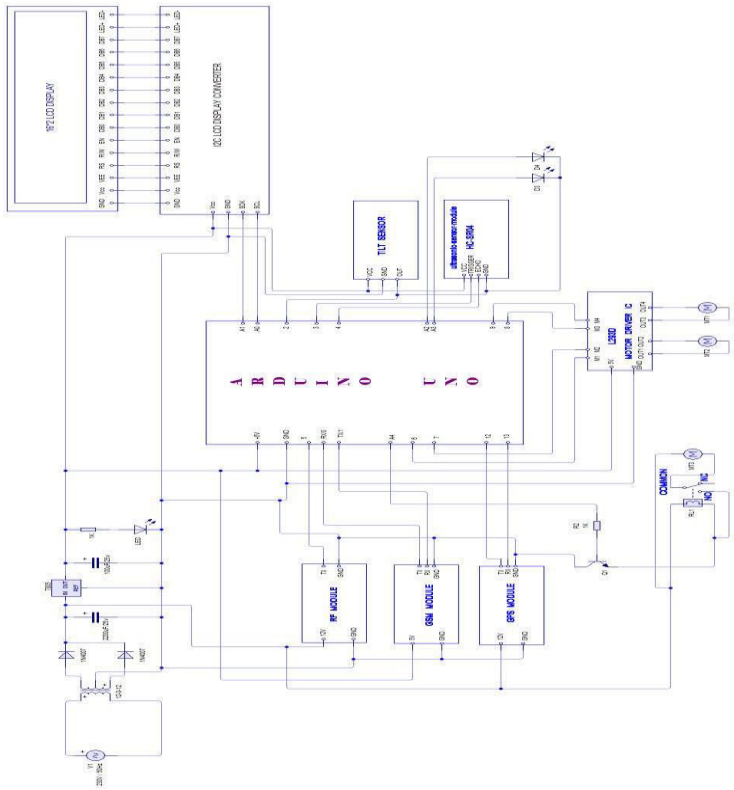
DC MOTOR:

A **DC motor** is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor.

MOTOR DRIVERS:

A motor driver IC is an integrated circuit chip which is usually used to control motors in autonomous robots. Motor driver ICs act as an interface between microprocessors in robots and the motors in the robot. The most commonly used motor driver IC's are from the L293 series such as L293D, L293NE, etc. These ICs are designed to control 2 DC motors simultaneously. L293D consist of two H-bridge. H-bridge is the simplest circuit for controlling a low current rated motor. For this tutorial we will be referring the motor driver IC as L293D only. L293D has 16 pins.

SCHEMATIC DIAGRAM:

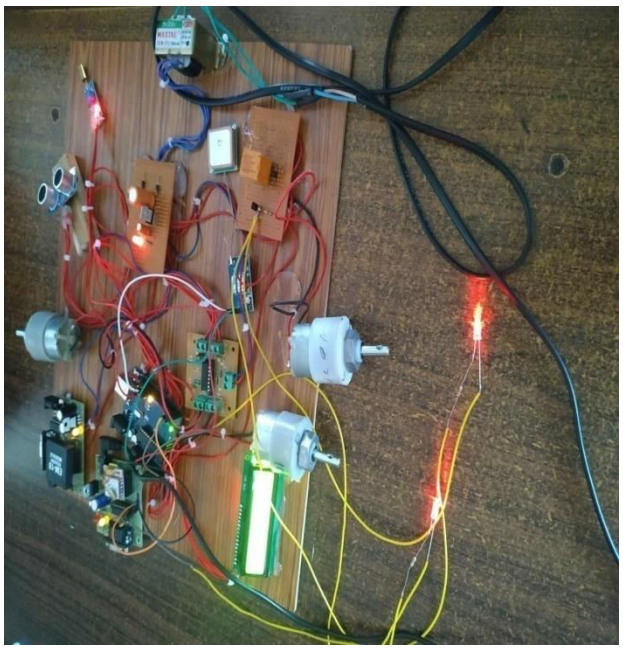


WORKING OF SMART FEATURED VEHICLE IN SMART CITY:

The project deals with the "SMART FEATURED VEHICLES IN SMART CITY". Today's main problem is the usage of more number of trucks for goods delivery of each company. Hence pollution issue, fuel energy, noise pollution, over traffic were raised. For this we are using separate vehicle with number of trolleys along with RFID tags are processed by arduino MC to

leave the trolleys to their respective locations of a company. In order to control the over steering and under steering problem, by using TILT sensors we

are identifying the turns and the controller will process the data to slow down the engine and breaks will be apply to required wheel by the concept of dynamic stability control. The next processing of the controller is done for automatic ON and OFF of headlamp LED's. The identification of the opposite objects is done by input source ultrasonic sensor and the respected LED's of headlamps will switches ON and OFF.



RESULT:

Finally the output of the project

" SMART FETURED VEHICLE IN SMART CITY" helps in avoiding accidents at dark night, controlling of motor at curves and it can also be used for over traffic control.

COMPONENT KIT

Arduino is interconnected with GSM, GPS, Ultrasonic sensor, Tilt sensor, Relay, Motor divers and LCD display. Transformers are used for giving power supply to all components.

OVER TRAFFIC CONTROL SYSTEM:

Waiting For Vehicle

Vehicle Detection

Getting GPS Data

Finding Module

Module Connected

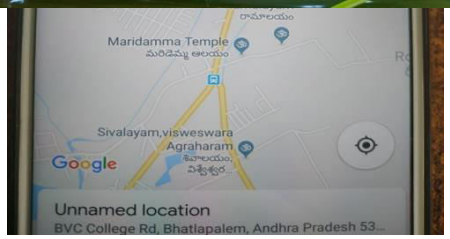
Disabling ECHO

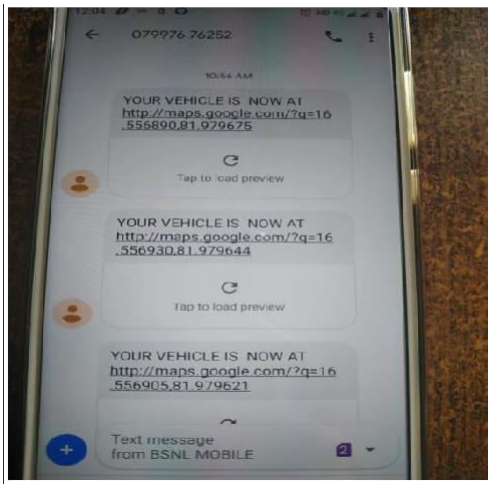
Echo OFF

Network found

Message sending

Message delivered





Location tracking

OBSTACLE DETECTION:

Entering Into Driving Mode

Waiting For Obstacle

Obstracle Detected

CONTROLLING MOTOR AT CURVES:

Wating For Curve

Curve Detected

CONCLUSION:

The conclusion for "SMART FEATURED VEHICLE IN SMART CITY" is it helps in avoiding accidents at dark night, controlling of motor at curves and it can also be used for over traffic control.

FUTURE SCOPE:

- In future everything is gone online. So there is a future scope to decrease the size of trolleys.
- In future an automatic sensing system can be used to find the obstacle distance and gives an indication by the buzzer.
- For the problem of oversteering and understeering we can also use automatic breaking system for the future purpose

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