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Smart Parking Alert System in Electric Vehicle

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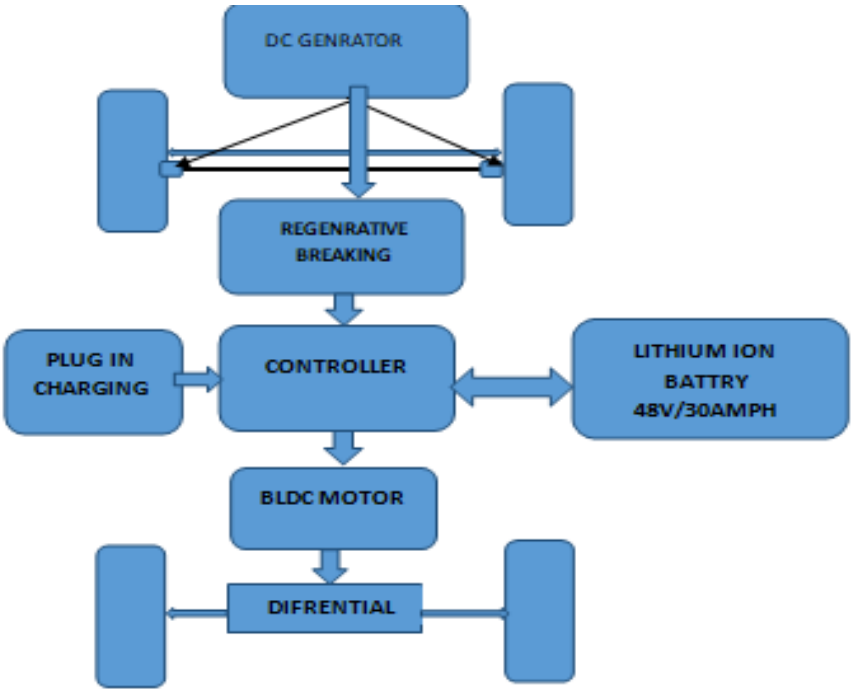
Abstract: This project describes about an obstacle evasion robot vehicle which is controlled by ultrasonic sensor. The robot is made using ultrasonic sensor and it is well-ordered by Arduino microcontroller. Ultrasonic sensor fixed in front portion of the robot vehicle. The sensor gets the data from nearby area through mounted sensors on the robot. The sensor is sense the obstacle and deviate its path to choose an obstacle free path. The sensor will be send the data to the controller is associated with controller to decide the movement of the robot Wheel. This project uses accelerometer sensor which can detect the unevenness of vehicle and vibrations when an accident is occurred. This sends a signal to microcontroller. Vehicle accident detection system using GSM and GPS modems is done. Messages notifications are sent to the mobile number which is agreed. The arduino courses this information and this processed information is sent to the user/owner using GSM modem . A GSM modem is interfaced to the MCU. Heat sensor used to notice temperature level and leakage of harmful gases in the vehicle.

Keywords: Ultra-sonic sensor ,GSM,GPS ,Geo satellite information, MCU

INTRODUCTION

Research and development of Electric Vehicles (EVs) has received accumulative courtesy from governments, industry, and public around the world due to the growing disquiets about global warming, fossil fuel shortage, as well as passenger vehicle safety. Great technical progress has been made in the areas of system structure and key component advance for electric vehicles in recent years, but there is still a performance gap between electric vehicles and conventional vehicles with respect to driving range, energy-saving and power train effectiveness and safety.

Fig.-Block Diagram of Multi-charging Electric Vehicle



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For a conventional vehicle, a substantial amount of energy is consumed in urban driving cycles by braking. To improve the exhibition of electric vehicles, the regenerative braking system has been developed. It utilizes the electric motor, providing negative torque to the driven wheels and changing kinetic energy to electrical energy for restoring the battery or power supply.. Research signposts that substantial energy savings are in fact achievable, from 8% to as much as 25% of the total energy use of the vehicle, contingent on the driving cycle and its control approach. Particularly, this additional energy recycling can be achieved without totaling of any extra components. In addition to their energy regeneration benefits, motor brakes are superior to hydraulic brakes in their accuracy, quick retort and ease of measurement.

BLDC MOTOR

Today's automakers use three different types of electric motors in green cars: the BLDC motor, brushed DC motor, and AC induction motor. The BLDC motor has a permanent-magnet rotor bounded by a wound stator. The winding in the stator get commutated electronically, in place of brushes. Brushless DC motors normally have an competence of 85-90%, while brushed motors are usually only 75-80% efficient. Brushes ultimately wear out, sometimes causing treacherous sparking, limiting the lifespan of a brushed motor.

WORKING PRINCIPLES AND OPERATION

The fundamental principles for the working of a BLDC motor are the same as for a brushed DC motor; i.e., internal shaft position feedback. In case of a brushed DC motor, feedback is applied using a mechanical commutator and brushes. With a in BLDC motor, it is reached using multiple feedback sensors. The most commonly used sensors are hall sensors and optical encoders.

Hall sensors work on the hall-effect principle that when a current-carrying conductor is visible to the magnetic field, charge carriers experience a force based on the voltage advanced across the two sides of the conductor.

Fig.-BLDC Motor

ARDUINO (Controller)

Fig: Arduino UNO

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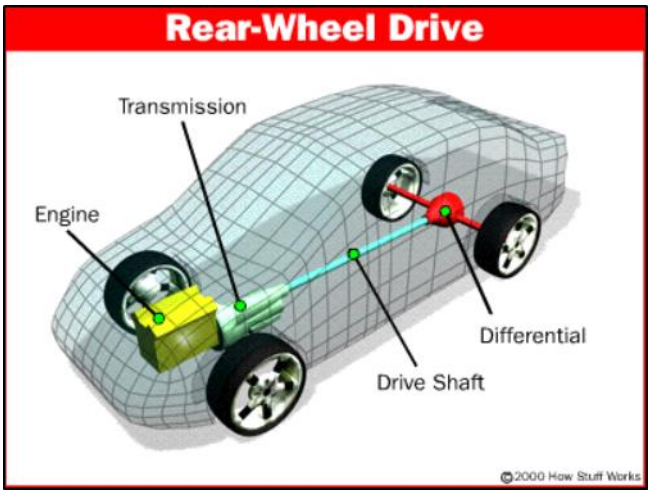
The high-enactment Microchip pico Power 8-bit AVR RISC-based microcontroller syndicates 32KB ISP flash memory with read-while-write capabilities, 1024B EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general resolve working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, a 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts.
By performing influential instructions in a single clock cycle, the device achieves throughputs impending 1 MIPS per MHz, balancing power consumption and processing speed.

DIFFERENTIAL

WHY YOU NEED A DIFFERENTIAL

Car wheels turn at different speeds, especially when turning. You can see from the animation that each wheel travels a diverse distance through the turn, and that the inside wheels travel a shorter distance than the outside wheels. Since speed is equal to the distance travelled divided by the time it takes to go that distance, the wheels that travel a shorter distance travel at a lower speed. Also note that the front wheels travel a different distance than the rear wheels.

For the non-driven wheels on your car the front wheels on a rear-wheel drive car, the back wheels on a front-wheel drive car this is not problem. There is no joining between them, so they spin autonomously. But the driven wheels are allied together so that a single engine and transmission can turn both wheels. If your car did not have a differential, the wheels would have to be sealed together, forced to spin at the same speed. This would make turning problematic and hard on your car: For the car to be able to turn, one tire would have to slip. With modern tires and concrete roads, a great deal of force is need to make a tire slip. That force would have to be transmitted through the axle from one wheel to another, putting a heavy draining on the axle components



BATTERIES

Batteries produce electricity using liquids or metals that are good conductors of electricity. You've perhaps seen that batteries have a + and a – sign on them. The positive and negative ends of the battery represent the two electrodes of the battery. Electrodes are two different kinds of metals that can move electrons between them, which generates electricity. The electrode that electrons move away from (with a negative sign) is called an anode. The electrode that electrons move towards (with a positive sign) is called a cathode. When a battery is connected to a motor or other device that is powered by electricity, ions start moving from the cathode to the anode through the material that separates them, called the electrolyte. Electrons don't travel through the electrolyte, so they have to move through the wires connected to the motor, which creates an electric current.

In the batteries lithium ions change from the negative electrode through an electrolyte to the positive electrode during discharge, and back when charging. Li-ion batteries use an introduced lithium compound as the material at the positive electrode and typically graphite at the negative electrode.

Research areas for lithium-ion batteries include life extension, energy density, safety, cost reduction, and charging speed, among others. Research has been under way in the area of non-flammable electrolytes as a way to increased safety based on the flammability and volatility of the organic solvents used in the typical electrolyte. Approaches include

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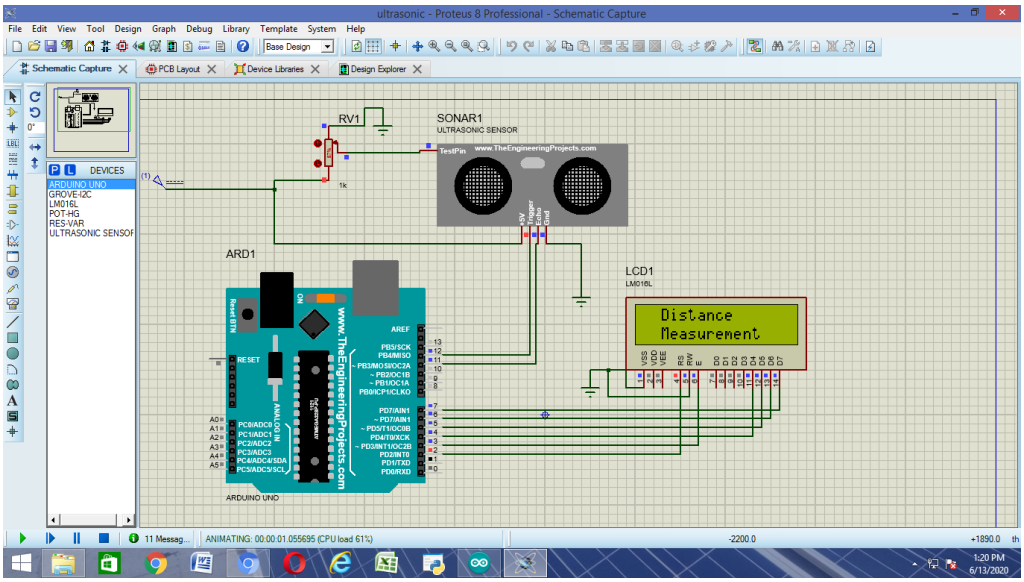
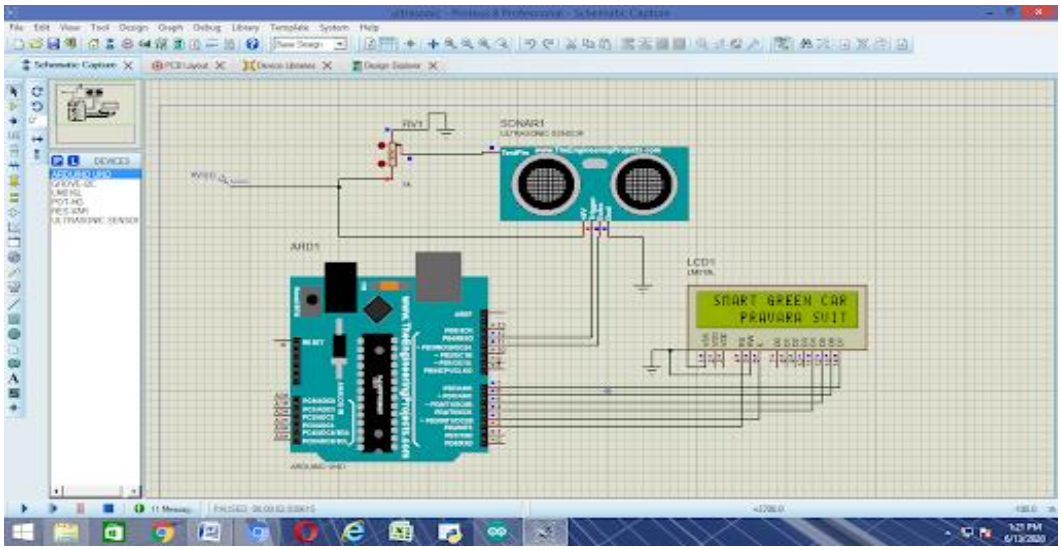
aqueous lithium-ion batteries, ceramic solid electrolytes, polymer electrolytes, ionic liquids, and deeply fluorinated systems.

SYSTEM IMPLEMENTATION





FUTURE SCOPE

The Arduino is going to reduce the minimum volume essential to include a control and sensing system with a product. Instead of expenditure large amounts money to build hundreds of obstinate circuit boards, the Arduino will allow businesses to bring many more unique devices to marketplace at lower breakeven volumes. Nowadays, technology has conquered, to a great degree, our lives. One of its “miracles” is the Arduino. Most people maybe don’t know what Arduino technology is or, even if they do, they have not fully unspecified its full potential. However, its range of operations makes it a useful tool for the future. As Edward Teller once stated: “the science of today is the technology of tomorrow.” Hence, the capabilities and the way this small scientific “miracle” works need to be labelled and interconnected sufficiently. Arduino is an open-source computer hardware and software company, a project and a user community that strategies and makings kits with a scope of creating digital devices and collaborating objects that can sense and control the physical world . Arduino programming language is based on Wiring, which contains some data from C and C++ as well. In other words, it is a platform with which the correct programming can subsidise in the expansion of robotics. In order to program Arduino, computer software provided by the company should be relocated and then users can start creating projects with

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this platform. The simplest thing you can do is to make an LED blink automatically via a computers. For more complex applications like aiding vision for patients, you also need various “boards” such as Arduino Uno, Robot, Pro and Mega 2560 . In general, whoever has resourcefulness and patience, can manufacture whatever he/she wants using Arduino. Moreover, no advanced programming knowledge and techniques are needed – basic knowledge is adequate.

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