

## Design and Implementation of Automatic E-Vehicle

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*Abstract:* Electric vehicles are a relatively recent technology that is seeking for its place in the market. It has several advantages, such as the reduced greenhouse emissions, fuel savings and its ease of use. The main problem of todays E-vehicles are the temperature of the battery. The temperature of the battery increases and the battery will blast or accidental condition occurs. In our project we are designing a kit for electric vehicles for automatic control the temperature of the battery and in accidental condition send message and location to the relatives.

## **INTRODUCTION**

All existing vehicles that are in the market cause pollution and the fuel cost is also increasing day by day. In order to compensate the fluctuating fuel cost and reducing the pollution a good remedy is needed i.e., our transporting system. Due to ignition of the hydrocarbon fuels, in the vehicle, sometime difficulties such as wear and tear may be high and more attention is needed for proper maintenance. Our vehicle is easy to handle and fuel cost is very low compared to the other existing vehicles. It will not add turban Department of Management Studies, MSRIT Consumer Awareness and Perception towards E-bikes pollution. The only thing required is to keep this bike charged with a battery. Electric bike manufacturing is considered as a grass root movement away from fossil fuels. Definitely, electric bikes are not the only answer to our environment problem, but it definitely will help us to treat environment better. In our project we are designing a kit for electric vehicles for automatic control the temperature of the battery and in accidental condition send message and location to the relatives.1) For automation control we are using ATmegau-controller for doing all operation. 2) We are using LM-35 sensor for sensing the temperature and for cooling we are using fans. 3) We are using Vibration sensor module SW-420 for detection of the accidental condition. 4) For sending sms and location to relatives after accident we are using GPS and GSM module.

## LITERATURE RE<mark>VIE</mark>W

- 2.1 Józef Gromba, 2018 European Union, the paper focuses on using the BLDC motor as electrical bike drive. As of today on the market there are already different methods of controlling electrical motor of a bike. The most common is setting the motor's speed with a lever mounted on handlebars. Controlling motors torque instead of speed makes new principle of how the drive works. Proposed method of control is based on controlling the motor torque in such a way that allows the user to set a desired torque value keeping the force on bike pedals constant. This article covers different methods of controlling the BLDC motor, analysis of electrical bike movement, methods of calculating the load torque, controlling electromagnetic torque of the motor, simulations and laboratory research..
- 2.2 R. D. Belekar introduces an alternator charging system for electric vehicle. At Nov 2017, IRJET paper of Yash Khandekar and Prathamesh Kulkarni introduces the concept of generator based alternate charging and discharging system. In this concept the generator is used as charging system. Initially there is some power stored in the batteries which will supply energy to the motor and hence the rear wheels will be operated and the car will run. Due to the car's motion, generator which is placed in the front will supply electricity to the batteries via a DC-to-DC Boost Converter to the batteries. Battery will get charged and provide power to the motor hence completing the cycle.
- 2.3 Mr. Anand Chopade, 1st Jan 2019, this paper introduces the improvement of a partner degree, Electric Bicycle System" with an imaginative methodology. The point of this paper is to demonstrate that the ordinary bi-cycle can be moved up to electric one by some means that including the advancement of a regenerative stopping mechanism and imaginative BLDC engine control –yet in addition utilizes ongoing detecting and the forces of publicly supporting to enhance the cycling background; get more individuals riding bicycles; and to help in the structure and improvement of urban communities. Electric bicycles have at the same time picked up fame in numerous locales of the world and some have

#### **BLOCK DIAGRAM**



#### **OPERATION**

For the safety of bike, we implement the Two automation systems in this one is automatic cooling system and other is automatic accident detection system.

LM35 analog temperature sensor keep in contact with the main battery to sense the heat or temperature of the battery and to indicate the temperature of battery on LED display in degree Celsius. When temperature is above 65 degree C then Fan get turn ON and LED shows the RED indication. And if temperature is bellowing55-degree C then its show Normal temp which shows by green indicator and for medium temperature (55-65 Degree C) Yellow Indicator is used.

For accident detection we have used vibration sensor as a input to Arduino nano controller and GPS Module is used to track location of accident and GSM module is used to send the SMS of accident with location co-ordinates which is cached by GPS module

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### SIMULATION DESIGN

## A. Automatic Cooling System:

Here we can see Temperature is increased, it is above 135F so to Indicate this temperature by Red LED is turn on and to control this temperature Fan is also turn ON. To change temperature value, we can press + and - on LM35 Temp sensor



## B. Automatic Accident Detection:

In above condition A. We can see Switch (Vibration sensor input S/W) position is in OFF condition. And now in this B. the S/W is turn ON means vibration sensor input Switch is turn ON that is showing it is accidental condition so to calling help controller will read this input and it will send SMS- "PLEASE HELP" to Mobile. here we have provided virtual screen as a mobile screen. And we can see output on virtual Screen.

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## RESULTS

### **Result Table1**

Case No	Case	Action		
А	Automatic cooling system	RED, LED ON	Radiator ON	
В	Automatic Accident detection	Vibration sensor (s/w) ON	"PLEASE HELP" This SMS sent to MOBILE	

## FINAL HARDWARE

## • Automatic cooling system:

Here we can see the result of Automatic cooling system. At the normal temperature, green LED is in ON condition & When temperature increased then yellow LED is turn ON and if Temperature is high(above 65 degree C) then RED led get turn ON and fan get turned ON.



Figure A

## • Accident detection:

In figure A we can see the accidental condition, which is showing by Red LED of vibration sensor. And in figure B we can see accident occurred SMS is received and location co-ordinates also send by our system for help.

In figure C location is tracked when we clicked on text SMS in figure B.

0:31 .stl : Titl 20.a @ • ▲ Akash kamble +019527003051 ivdia	•••	
PLEASE HELP MEAccident occurred http://www.google .com/maps/place/16.689754,74 .645111		
• Message		

Figure B



Figure C

## PROJECT APPLICATION

- It provides help at accidental case
- It helps to control battery temperature automatically

#### CONCLUSION

In this paper, we have designed a process of the project which shows that our project is economical cheap, quick, and easy operation depending on Arduino. The concept of the project is designed in Proteus Simulator Software with the help of Arduino. We have done simulation and hardware implementation of Automatic cooling system and Automatic accident detection which is Automatic SMS sending to relatives for help in accidental condition. This report shows all operating conditions of the project in a Simulator and hardware.

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