

# DESIGN OF LIGHT WEIGHT TWO WHEELER USING SOLAR AND ELECTRIC POWER EQUIPPED WITH GSM AND GPS

Saddi Nitin Reddy<sup>1</sup>, Pasunuti Rishitha<sup>2</sup>, Rayudu Sai Divya<sup>3</sup>,  
Vineeth Narwa<sup>4</sup> , S.Madhava Reddy<sup>5</sup>

<sup>1-4</sup>UG Student, Dept of Mechatronics Engineering, Mahatma Gandhi Institute of Technology, Telangana, India

<sup>5</sup>Professor, Department of Mechatronics, MGIT, Telangana, India.

\*\*\*

**Abstract** – Transportation plays a vital role in human life. Even for small distances people use 2-wheeler which causes massive pollution. This project deals with solar and electric power to drive this vehicle, which is emission free (zero pollution). In a world where environment protection and energy conversion are growing concerns, the development of solar and electric vehicle has taken on an acceleration pace. A solar panel and lead acid batteries are used to charge this vehicle. Accelerometer detects the sudden change in the axes of vehicle and GSM module send the alert message on your Mobile Phone with the location of the accident. When met with an accident this vehicle detects the current location with the help of GPS and an alert message is sent to the register mobile numbers using GSM. The possible result we can get from this project is reduced pollution and a major help to the people who can't handle heavy vehicles.

**Key Words:** Solar power, GSM, GPS, Battery, Vibration sensor

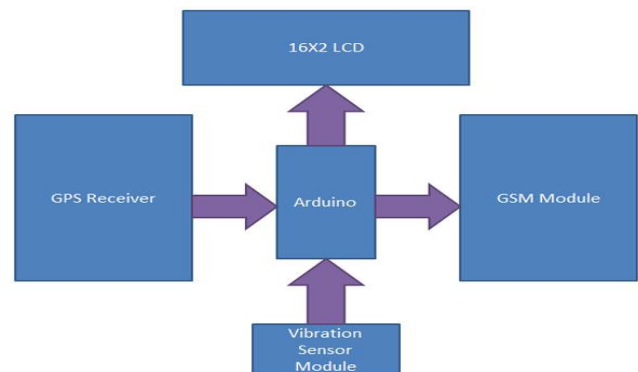
## 1. INTRODUCTION

In twentieth century, the number of vehicles exponentially increases due to growth in the automobile industry. Transportation plays a vital role in life. The major drawback of the society is environmental pollution so taking into concern both transportation and environment, the Design and Fabrication of two wheeler using solar and electric power equipped with GPS and GSM has been designed and fabricated to reduce environmental pollution by using natural source of light and electricity and main motive of the project is to design light weight two wheeler .Now a days two-wheeler are too heavy above 100kgs so it is hard for the old people to drive or handle that weight. So we have designed a vehicle which can bear up to 120 kgs and it weights around 25kgs (approx). GPS, GSM are equipped and

it can show the location where the accident occurs, fuel cost is zero.

## 2. HARDWARE COMPONENTS

**Arduino Uno:** It is the central control unit for the Accident detector and alert system. It basically gathers information from vibration sensor module and GPS sensor module, process it and display output to LCD and send message alert to the mobile.



**Fig 1: Block Diagram of Arduino based Car Accident SMS Alert System**

**GSM and GPS:** This system uses GPS and GSM. Whenever the vehicle is met with an accident the GPS detects the location of the vehicle with the help of trilateration principle and GSM sends the alert message to the registered mobile number.



Fig 2: GSM Module and GPS Module

**Dc motor:** A DC motor consists of a stator, an armature, a rotor and a commutator with brushes. Opposite polarity between the two magnetic fields inside the motor cause it to turn. A DC motor consists of a stator, an armature, a rotor and a commutator with brushes. Opposite polarity between the two magnetic fields inside the motor cause it to turn.



Fig-3: DC Motor

**Solar panel:** This system uses a solar panel. Solar panels are those devices which are used to absorb the sun's rays and convert them into electricity or heat. A solar panel is actually a collection of solar (or photovoltaic) cells, which can be used to generate electricity through photovoltaic effect. These cells are arranged in a grid-like pattern on the surface of solar panels.



Fig-4: Solar Panel

**Lead acid batteries:** The negative plate is made up of lead and the positive plate lead dioxide in the fully charged state. Concentrated sulfuric acid is the electrolyte, which retains most of the chemical energy. This batteries are less in cost and gives maximum efficiency.

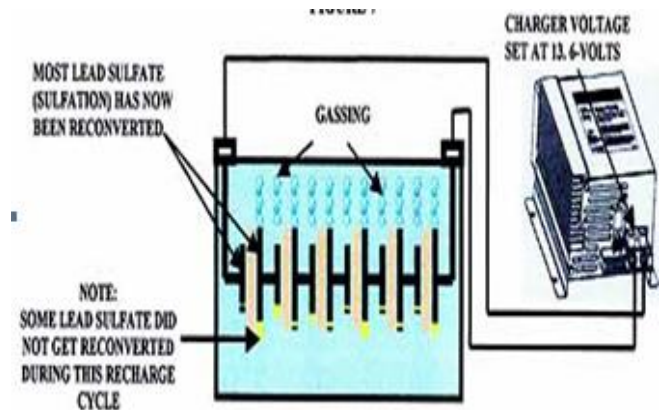


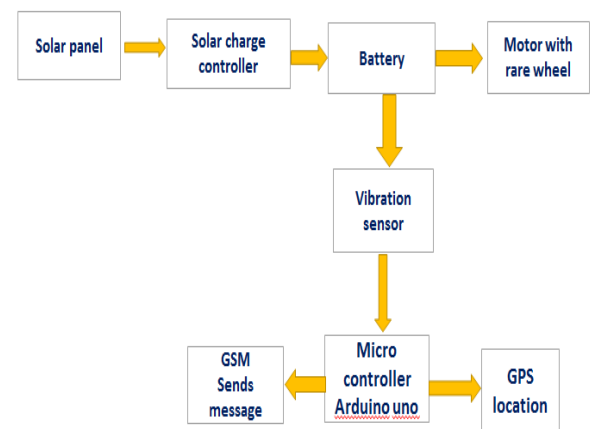
Fig-5: Lead Acid Batteries

**Vibration sensor:** This system uses vibration sensor for accident detection. A vibration sensor switch will make or break contact when certain vibration levels are detected. A vibration sensor switch will make or break contact when certain vibration levels are detected.



Fig-6: Vibration Sensor Module

### 3. BLOCK DIAGRAM



### 4. WORKING

- Solar panel is placed at an angle where large amount of photon energy can be segregated and it is connected to a battery.

- Charging of battery can be done by using solar energy or by plugging in the vehicle with an electric system.
- Battery with the capacity of 24v and 7amp is placed at the bottom of the vehicle which is connected to a dc motor of 24 volts.
- This vehicle uses chain drive mechanism and it is a rear wheel drive.
- Vibration sensor detects the first occurrence of the accident and it is intimated to the microcontroller.
- The Latitude and Longitude are detected using GPS and it is sent as message to the rescue team through GSM.

## 5. ADVANTAGES

- This vehicle can be charged using both and electric and solar energy.
- It can be used by any age group from starting from 15 years; hence it is easy to operate.
- Sends alert messages when met with an accident to the registered mobile number.

## 6. CONCLUSION

- This paper mainly focuses on the how this two light weight wheeler is emission free and it can be used by any age group.
- The battery can be charged using solar and electric energy.
- Periodic maintenance is required for this vehicle.

## REFERENCES

- [1] Marie Bernadette Pautet and Michel Mauley, "The GSM system for mobile communications," 1992.
- [2] Understanding GPS: Principles and Applications (Artech House Telecommunications Library), Elliott D. Kaplan (Editor) / Hardcover / (1996)
- [3] Alex Fares, "GSM systems engineering and network management," 2003.
- [4] Md. Syedul Amin, JubayerJalil and M. B. I. Reaz, "Accident detection and reporting system using GPS, GPRS and GSM technology," October 2012, DOI: 10.1109/ICIEV.2012.6317382.

[5] FengyuanJiaHongyan Wang "A New Type of Automatic Alarming Device to Rescue Accident Injured in Time".

[6] Sri Krishna ChaitanyaVarma, Poornesh, TarunVarma, Harsha "Automatic Vehicle Accident Detection and Messaging system using GPS and GSM Modems", International Journal of Scientific & Engineering Research, Volume 4, Issue 8, August-2013 ISSN 2229- 5518.

[7] GPS: Theory and Practice, B. Hofmann-Wellenhof et al., Springer Verlag, 1992, ISBN 3-211-82364-6 and 0-387-82364-6

[8]reenithyChandran, SnehaChandrasekar, N Edna Elizabeth, "Konnect: An Internet of Things(IoT) based smart helmet for accident detection and notification ", in 2016 IEEE Annual India Conference (INDICON) ,pp.1-4

[9] MohdKhairulAfiqMohdRasli, Nina KorlinaMadzhi, Juliana Johari, "Smart helmet with sensors for accident prevention ", in 2013 International Conference on Electrical, Electronics and System Engineering (ICEESE) , pp. 21-26

[10] Nandu R & Singh K, "Smart Helmet for Two Wheelers" AdvAutomobEng 3:110. Oct 2014, doi:10.4172/2167-7670.1000110