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SOLAR-POWERED ELECTRIC VEHICLE

[1] **Dr. D Nageshwar Rao,** [2] **A. Joseph Anisha,** [3] **B. Sai Vardhan,** [4] **Ch. Anusha**
[1]Professor, Dept of Electronics and Communication Engineering, TKR College Of Engineering and Technology
[2,3,4] B.Tech Students, Dept of Electronics and Communication Engineering, TKR College Of Engineering and Technology

ABSTRACT

This project's main goal is to use solar energy to produce electricity to fuel electric vehicles. Dealers of natural resources, such as gasoline and coal, are currently finding it difficult to keep up with the rising demand. Therefore, it is essential to conduct fresh explorations of natural sources of energy and electricity in order to meet this need. Because of this, sunlight is now seen as a source of energy that is used in many daily activities. Through the utilization of sunshine, solar energy is used to create electricity. In our project, we plan to create a solar-powered vehicle with the aid of this technology. Solar panels are the primary building block for solar cars. In the batteries of the solar automobile, the solar cells store a portion of the energy that the sun provides. In order for the batteries and the motor to utilize solar energy, power trackers transform it to the appropriate system voltage before it can be used. The motor and motor controller can utilize the energy that has been stored in the batteries to move the automobile after it has been released from the batteries. We will utilize sets of batteries: one will get its power from the panel to power the engine, and the other will serve as an auxiliary power source, supplying the rest of the electrical equipment in the car with what it needs to function.

INTRODUCTION

Direct solar energy is the main source of electricity for solar vehicles. To capture and transfigure solar energy into electrical energy, photovoltaic cells (PVC) are put on the vehicle. The semiconductors, which are made of silicon and blends of indium, gallium, and nitrogen, absorb light and also release it, creating an inflow of electrons that induce electricity. This electricity charges the 12V battery connected to the semiconductors, which in turn powers the DC Motor, which transmits power to the bus of the vehicle. In some configurations, the motor can run solely on the electricity produced by solar cells.

Autonomous robotic vehicles have long employed solar power systems often. The Sojourner rover is one such illustration, which generates a large portion of its energy using a smaller photovoltaic (PV) panel. The rover will however cut

back on consumption if there is little to no solar energy because its batteries can't be replenished in a timely manner when they run out. In a space mission, the Mars Exploration Rovers were the first devices to employ rechargeable batteries. Spirit and Opportunity did, however, satisfy the demand for more operating flexibility by expanding the use of solar panels. Solar panels for the next Exo Mars expedition will be created using this methodology. The high-efficiency ultrathin film silicon cells in this rover allow it to produce more electricity

Vehicles for the exploration of various generations were inspired by NASA initiatives. A prototype robot box for usage in polar conditions was recently produced by Lever and his colleagues using the modeling, designing, and production techniques they had found before. To optimize the system-supplied power for five cube-shaped PV modules, the platform, dubbed Cool Robot, employs a maximum power point (MPP) control algorithm. The best selection of solar energy and other power sources in accordance with a robot's operation circumstances is the main achievement of a number of noteworthy initiatives.

In order to advance several facets of the aforementioned rovers, the VANTER robotic exploration vehicle was created. Figure 1: Simple Robotic VANTER In the next section, the robotic mobile system is described. It introduces its architecture of hardware and software and outlines its key characteristics. The idea of an exploration vehicle equipped with a smart host microcontroller (SHM) for intelligent power management is presented in Section III. The control of the battery-charging system through tracked solar panels, which is the primary objective of this work, is described in the parts that follow. Additionally, the design of its mechanical structure, its electrical components, and its graphical user interface (GUI) are discussed. So, by evaluating the rover power systems in Section V, the current method is put into practice. It concludes by presenting the outcomes and conclusions of the conducted study.

However, population estimates predict that, during the next 100 years, the global population will probably stabilize at a level that is two to three times higher than it is today. Earth's scarce energy supplies are quickly running out due to the planet's growing population. Additionally, people's needs are growing. If that population is to be maintained with a good level of life for everybody, the question is whether the resources of the planet can support it. Energy is the primary concern in this.

Natural resource merchants, such as those who sell coal, gasoline, and other resources, are finding it difficult to meet the rising demand in the modern world. On the one hand, more automobiles or motor vehicles are dominating the transportation mode, while on the other side, gasoline is ruling these cars. In order to meet this demand, manufacturers and dealers are squeezing the few resources, which is putting our future, in which there will be a shortage of minerals and fuel, in jeopardy. Therefore, it is evident that current patterns of energy use, particularly oil consumption, cannot continue for very long. Additionally, these are to blame for environmental problems like global warming, an imbalanced environment, the thinning of the ozone layer, etc., all of which pose serious risks to the survival of the human species. These coffers are formerly again having a mischievous impact in light of the probability of global warming. A fresh exploration of natural sources of energy and electricity is thus veritably important in this situation. still, there is no need to explore when the resource is there in front of our bear eyes. Above all differently, it's a measureless force of energy, making it effective and less precious. It's conceivable to make the transition to energy-grounded frugality and continue the prognosticated development of global frugality with much better energy effectiveness. Solar energy is a good illustration of this.

- It helps conserve energy by reducing the use of fuel in vehicles.

BLOCK DIAGRAM

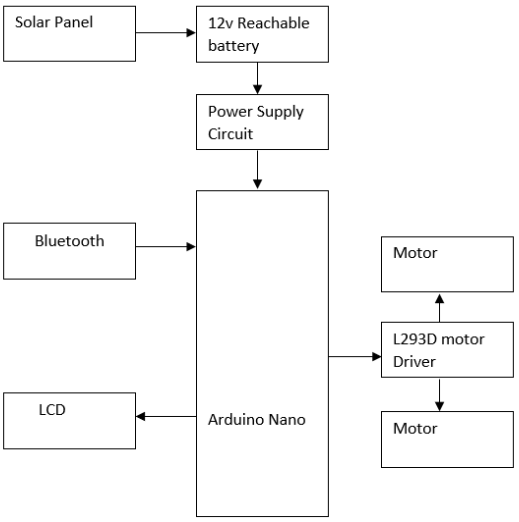

Fig. 1. Block Diagram

FLOW CHART

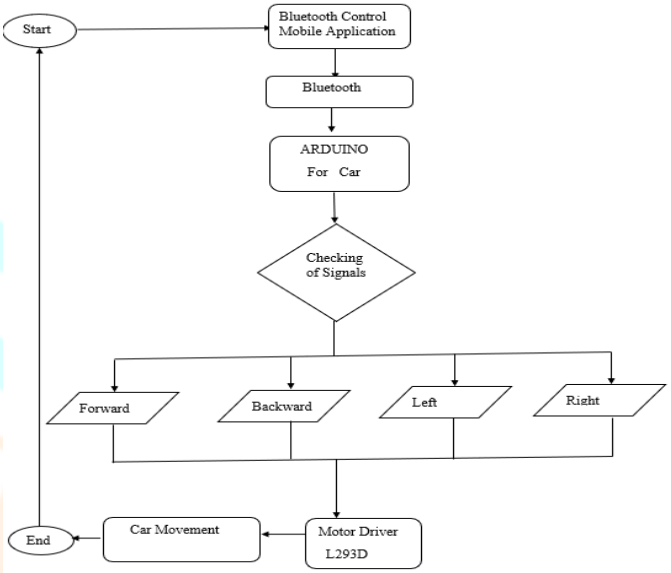

Fig. 2.Flow Chart of Solar powered Electric Vehicle

EXISTING SYSTEM

- The current electric vehicle system uses electricity as the main power source as it is more expensive.
- Electric cars are limited by range and speed. Most of these cars have a range of about 50-100 miles and need to be recharged again.

PROPOSED SYSTEM

- The main objective of this project is to generate power using solar energy to run electric vehicles.
- In this project, the system has been designed and installed to generate power using solar panels.

Experimental Set-up

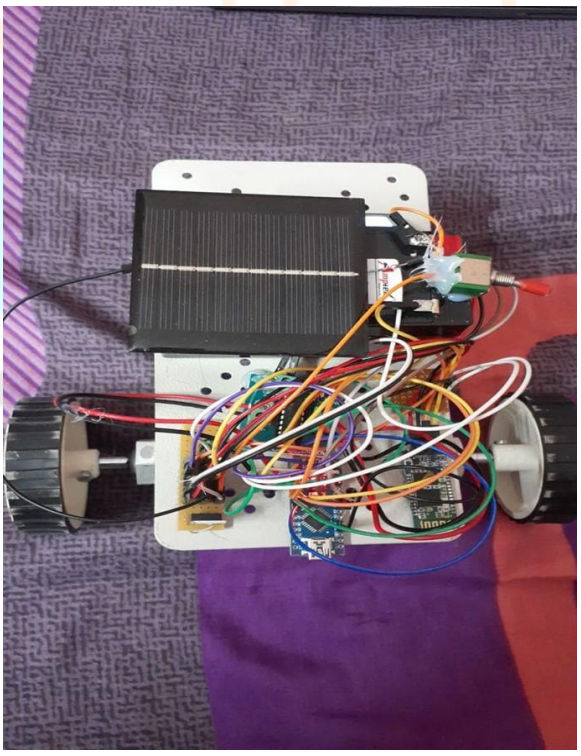

Fig. Experimental Set-up

RESULT:

This project aims to run a vehicle using solar energy. The batteries store the electric energy from the solar panel. So the vehicle is able to run even at night by energy stored in the batteries. The android application can control the movement of the robot as per instructions given, which are displayed on LCD.

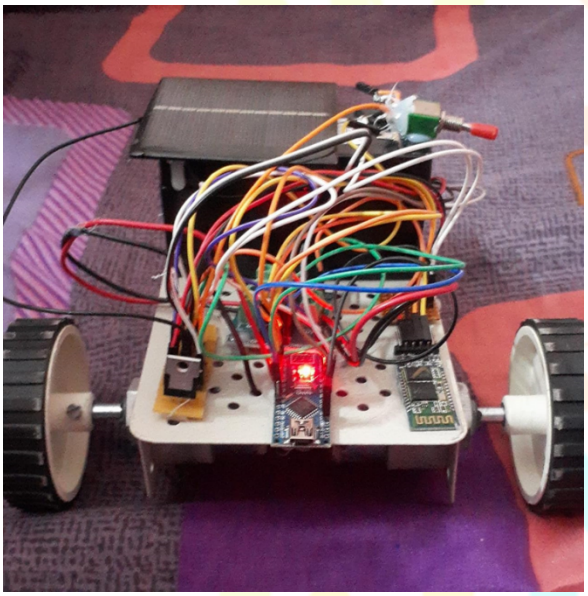

Fig. Result

ADVANTAGES

- It's a solar robot automobile that you can operate wirelessly.
- Both reconnaissance and surveillance are possible with the robot.
- It is extremely inexpensive and widely accessible.
- The robot's diminutive size makes it suitable for use as a spy.
- A design that is both simple and cost-effective.

APPLICATIONS

- Scientific Use: The majority of the probes to the other planets in our solar system have been remote control vehicles.
- Military and Law Enforcement Use: Remote-controlled vehicles are used by many police department bomb squads to defuse or detonate explosives.
- Search and Rescue: This can be a great asset to save the lives of both people along with soldiers in case of terrorist attacks.
- Forest Conservation.
- Used in aviation and space flight.

CONCLUSION

Solar Research Laboratory successfully tested the entire system. The Indian economy is expanding quickly, and the automobile industry is a key factor in this growth. The manufacture of solar vehicles will lead to job opportunities and reduced pollution. In addition, maintenance costs for solar cars are lower than for conventional cars. The solar power system that will power the robot is the primary focus of the project. The power source would also include a smart battery with integrated electronics and communication devices for charging and discharging the battery. A photovoltaic device, a charger, a selector device, and a battery system make up the power management system. Arduino is a clever microcontroller that is utilized to carry out essential tasks.

FUTURE SCOPE

For automatic obstacle detection and avoidance, IR sensors can be employed. The robot can be password-protected in the project so that the right password must be entered to run it. Receiving alarm condition notifications while the user is at work from their home would be fantastic.

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