Effective Method of Controlling The Vanter using Android Mobiles

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Abstract - The main objective of the paper is to the sunlight falls. The VANTER is controlled by means of smart host microcontroller (PIC16F88). The android mobile is used to track the rover and indicates is position, the amount of charging and discharging times of battery. The main concept of this paper is charging the Li-Po batteries that are used for two purposes. In case one battery is used for controlling the VANTER and another for ultrasonic detector develop the effective method of charging the Li-Po batteries using solar panel which is controlled by smart android mobiles. Hence the efficient power will be increased by solar tracking mechanism. By using the servomotor the solar panel tilted itself .

Keywords - Android, Mobile, Controlling, Vanter.

I. INTRODUCTION

The main aim of our paper is to charge the battery and hence to move the rover where there is sunlight. It is capable to provide high power with help of high efficiency Ultrathin–film silicon cell is constructed on the rover. The rover consists of four wheels which can rotate independently. The wheel consists of motor which is used for rotation and another for driving. The two rear wheels are controlled by servomotor.

When the sunlight hits an object the energy turns into heat, but when light hits certain material, like a solar panel, the energy instead turns into an electrical current. Solar photovoltaic (PV) panel use silicon crystal which produce the electrical current when struck by light. While silicon is very efficient at turning light energy into electricity, it tends to the cost more than “thin film” PV panel.

In a crystal, the bonds (between the silicon atoms) are made up of electron that is shared between all atoms of the crystal. When light get absorbed by the crystal, and individual electron in bonds get excited into a higher energy level and can move around the crystals freely, hence that produces an electrical current.

A solar tracker is a devicefor orienting a solar panel towards the sun. A solar tracker can substantially improve the amount of power produced by asystem by enhancing morning and afternoon performance. It is only worth installing trackers or non-concentrating application in the region with mostly direct sunlight.The panel can turn around the center axis. LINAK can provide the actuators that tilt the panels. LINAK supplies movement to your tracking system.

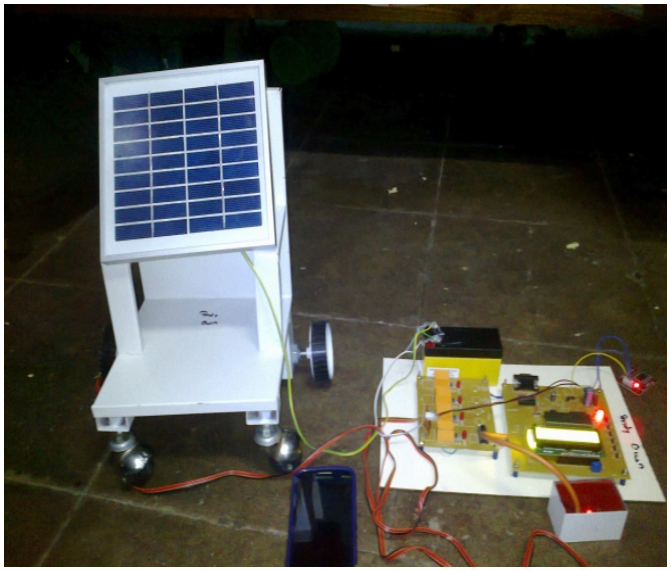

Fig1. Solar powered robotic VANTER

It is a specialist in linear movement and we have supplied electric linear actuators. An actuator is a type of motor that is responsible for moving or controlling a mechanism or system. It is operated by a source of energy, typically electric current, hydraulic fluid pressure, or pneumatic pressure, and converts that energy into motion.

Proteus is a fully functional, procedural programming language created in 1998 by Simone Canella. PROTEUS has many function derived from several other languages such as

C, BASIC, assembly.PROTEUS is a software technology that allows creating clinical executable decision support guidelines with little effort.

The PROTEUS guidelines are created with modular entities called knowledge components (KCs). Each KC represents a clinical activity and is executable knowledge with its own intelligence. It is used for transformation of data from one form to another is the main usage of this language. It is the best simulation software for various designs in the microcontroller. It is mainly popular because of availability of almost all microcontrollers in it. So it is a handy tool to test program and embedded designs for electronics hobbyist.

From the block diagram the operation of the rover can be easily studied. When the sunlight falls on the rover it is converted into an electrical pulses and the electricalpulses arecontrolled by the microcontroller. From the controller the PWM (pulse width modulation) signal is send to the battery (which has capacity of 12V). By using the pulse width modulationthe Li-Po battery is charged.

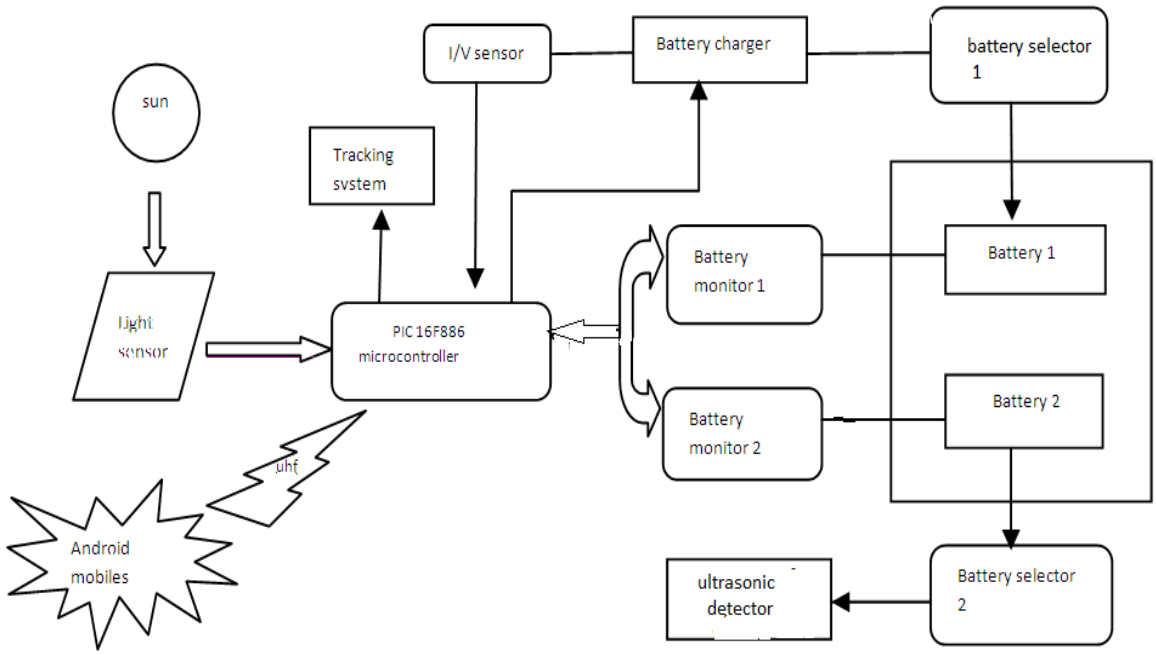

Fig2. Operation of the ROVER

Depending on the number of pulses arriving the battery via microcontroller the battery is charged.The ultrasonic detector is used to detect the obstacles with the help of microcontroller.

II.VANTER REQUIREMENTS

A Typical power management design consists of smart batteries integrating both communication devices and electronics able to control the charge. However when an economical system is required, the concept of intelligence should to software design for simple batteries. The system consists of and ++electrical Circuit, a chargerdevice, solar panel. The VANTER is based on PIC16F886 microcontroller.PIC16F886 microcontroller has 256 bytes of EEPROM data memory, selfprogramming, an LCD, 2 Comparators11 channelsof 10 bit analog to digital convertor, 1 capture/compare/PWM and one enhanced capture/compare/PWM functions a synchronous serial port that can be configured as either three wire serial peripheral interfaces (SPI) or the two wires integratedcircuit and an enhanced universal asynchronous receiver and transmitter (USART). All of these features make it ideal for more advanced level A/D application in automotive, industrial appliances or consumer appliances.

It has a flash program memory of 14KP. It has two timers (2*8bit, 1*16bit) and has a pin count of 28. A LCD (Liquid crystal display) displays which is used to determine the position of the rover. The microcontroller has 2 main functions that are used to control the rover.

1)Interpreting the operation data from the batteries and the solar panel to control the working mode of the charger.

2)Detecting the obstacle by using the ultrasonic detector.

III.VANTER OPERATION BASED ON SOLAR PANEL

The solar panel tracks the sunlight and charges the battery of 12V. The rover itself rotates where the sunlight falls. The PIC microcontroller sends the pulseto the battery and tracking system. From the battery, a part of power is send to the ultrasonic detector. By using the ultrasonic detector the rover can determine the obstacles. When the ultrasonic detector detects the obstacles it sends the information to the microcontroller via cable. The PIC microcontroller resends the pulse to the servomotor. The servomotor stops the rovers.

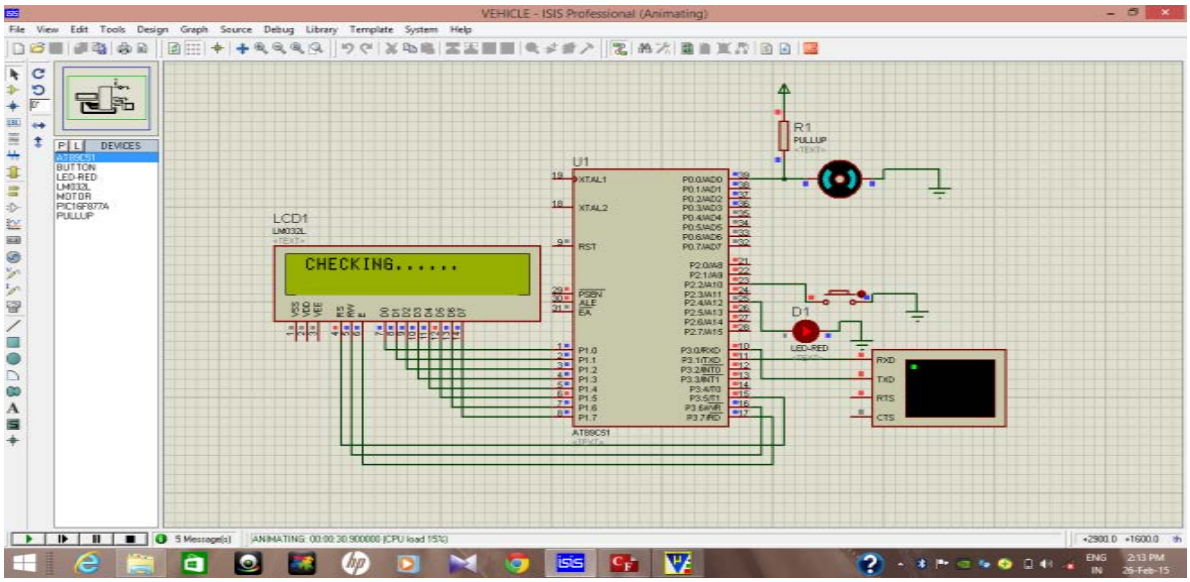

Fig3. Operation of the VANTER using the PROTEUS software

The rover moves in four directions (Right, left, forward, backward). The rotation of the rover is controlled with the help of the servomotor which is placed under the wheel. The rover can rotate in omni-directional by itself.

The solar panel converts the light energy into electrical pulses and these pulses are sends to the microcontroller. The PIC microcontroller instructs the pulse to battery.

The battery charges depend on the amount of pulses reaching the battery from the solar panel. The rover consists of LCD display which displays the direction of the rover where it is present. The controller is fetched by the program using keil c software.

The blue term is the software which is used to control the rover. Blue control is a basic universal remote control for blue tooth enabled serial device such as blue tooth module.

The four arrows in the display used for the direction control and its position. The blue term software can be easily downloaded with help of the google play or playstore apps. Initially the rover has to be connected or paired with help of Bluetooth. The device is name is HT-05. Once it is paired we can easily control the rover.

Fig3.Display of blue term

The controller is fetched by the program using KEIL program. The controller controls the rover using the Pulse Width Modulation. The Android mobile is used to control the rover's direction with the help of the software called "Blue Term".

IV. OBSERVATION OF THE VANTER

The VANTER is observed by the PROTEUS software. The PROTEUS software is used to observe the VANTER without help of the hardware kit. The PROTEUS software consists of all elements which is required for the rover. Initially encode the simulation in the Keil C and then it is fetched to the microcontroller(PIC16F88) and the diagram is shown in fig. After the completion of the connection, run is pressed, then the virtual terminal will be opened. When 1 is entered on the virtual terminal, the motor rotates in forward direction. When 2 is entered on the virtual terminal, the motor rotates in Backward direction. When 3 is entered on the virtual terminal, the motor rotate towards the right side. When 4 is entered on the virtual terminal, the motor rotates towards the left side. When 5 is entered on the virtual terminal, the motor will stop.

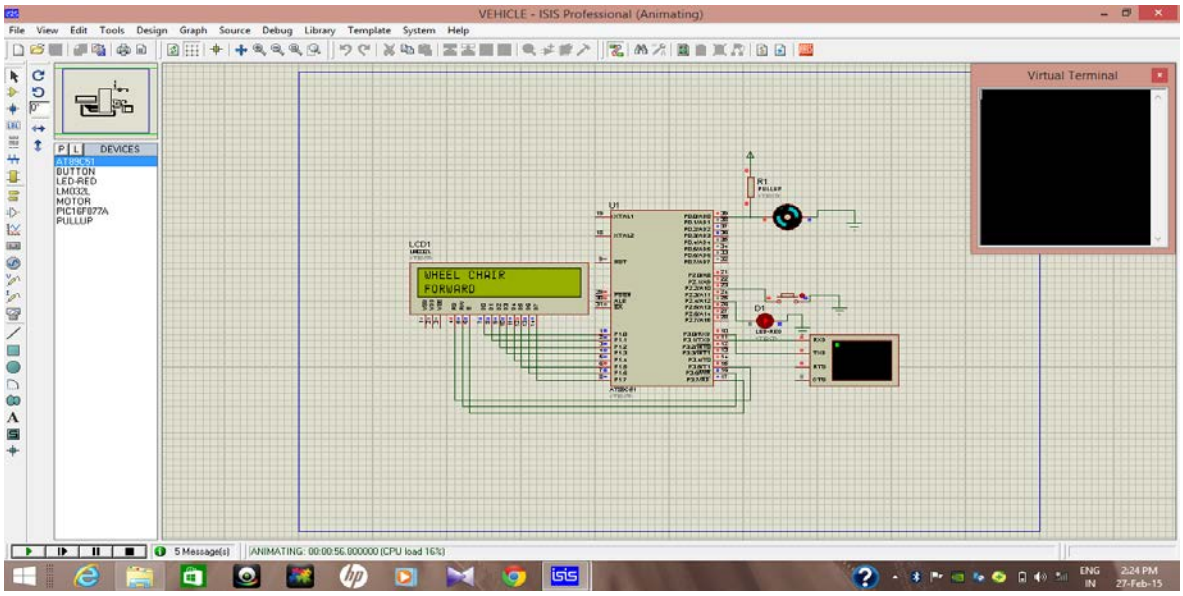

FIG4. VANTER rotates in forward direction

V. CONCLUSION

Based on this paper the rover is controlled by the android mobile and the rover is moved with the help of Li-Po battery which is charged with help of solar panel and it generates efficient amount of power.

Hence it provides maximum light intensity for the tracking system. Where the power from the solar panel are charged in the battery and the saved power is used as application of the load system as ultrasonic detector.

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