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## Solar Energy Operated Robotic System

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### ABSTRACT

Robots are now becoming a part of our daily life and acting ordinary tasks much more professionally and swiftly. Robotics as a subdivision of engineering deals with proposal, structure, procedure, and submission of robots. Their mobility is as efficient as the control signal. Humans can achieve extremely accurate tasks without much effort. This project objective at giving the same mobility to the robotic arm so that it can perform tasks precisely in an environment not accessible or suitable for humans, remotely using solar energy source and the RF pair to control the robot wirelessly. The automated arm so far composed can lift the items, with a specific end goal to broaden its capacity, further developed a framework to be utilized. We infer that the proposed framework works legitimately as the order is given. The proposed framework works on Keys, according to the key is squeezed the separate piece of the arms move. The Electronic Circuit, to which the keys are associated, comprises of Arduino and RF transmitter. On squeezing specific key, we see the consequential progress on the framework. Arduino recommends bearing development to the engine and mechanical arm conferring to the information got by Arduino by means of RF recipient. A sustainable power source is exploited for control up to the Robot arm unit; sun-powered board changes over daylight into electrical vitality.

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### INTRODUCTION

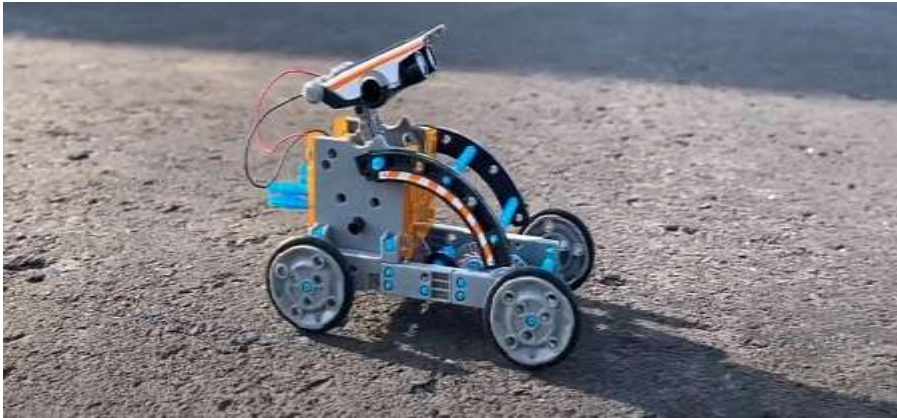
A robot is usually an electro-mechanical appliance that is guided by means of computer and electronic programming. Robots can be autonomous, semi-autonomous or remotely controlled. Robots can be used for a wide variation of tasks ranging from household tasks, industrial applications to investigation of outer space. Nowadays, advanced robots consist of hardware laterally with software. The software offers the required indication of intelligence to direct the mechanical parts to do the task. Humans have the extraordinary capability of haptic – a sense of touch. Our system exploits this feature to afford precise control signals to mechanical robotic arm wirelessly, giving the ability to accomplish even very delicate tasks without much determination. The user refers charge about the course of development of the robot whether the robot ought to go ahead, invert or stop and so on or about the rebellion and up/down development of the Robotic arm for pick and place. These summonses are exchanged to the Arduino board by means of RF transmitter. Arduino recommends heading of development to the engine and automated arm conferring to the information got by Arduino by means of RF recipient. A sustainable power source is utilized to control up to the Robot arm unit; sun based board changes over daylight into electrical vitality. L293D is an engine driver IC, which is utilized to drive engines as most microchips work at low voltages and require a little measure of ebb and flow to work while the engines require a generally higher voltage and ebb and flow. In this manner, current can't be provided to the engines from the chip.

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### Advantages of Robots

Robots can free people to focus on the creative process by taking care of unpleasant physical and mechanical work. The greatest benefits of robotics should be meant for people working in unhealthy environments, such as mines and deep waters. Using robots, industrial production could be maintained in countries with high labor costs – especially for small scale batch production. The third domain for robots would be confined to productive activities and tasks that a man cannot perform. Robots planned to analyze, audit and edit massive data are in the business interest of companies and private experts. The majority of data collected in the world has been gathered in recent years; approximately 90 per cent of it all in the past two years. Thus, the "Big Data" are real-time data and up-to-date; in their analysis, attention is paid to the volume of data stream, variances, and to the velocity of data. When big data is analysed on the basis of these criteria, businesses and other stakeholders will identify new opportunities in crowds, markets and networks. At present, the main challenge of robotization lies in combining human and robot activities, guaranteeing the safety of the "man-robot merger". The key aim is to find the best human-robot match. On the basis of co-operation of humans and robots, companies and the public sector would increase efficiency and capacity, as well as improve quality and industrial working conditions. In particular, co-operation of humans and robots would enhance the production of small series manufacturing. The background information necessary to understand the technology used for the design of a solar robot deals with different parts like charge controller, inverter, and power management, docking station and batteries. A charge controller has to protect the battery from overcharging. The core of the International Journal of Advanced Scientific Research and Management, Volume 3 Issue 10, Oct 2018 [www.ijasrm.com](http://www.ijasrm.com) ISSN 2455-6378 265 solar robot design is the power management. Many factors determined the type of power scheme used. The solar panels had to be

efficient and yet affordable, the capacitors had to be configured in a certain way for maximum performance, and circuitry had to be introduced to manage or regulate the power.



### Solar Robot Behaviour

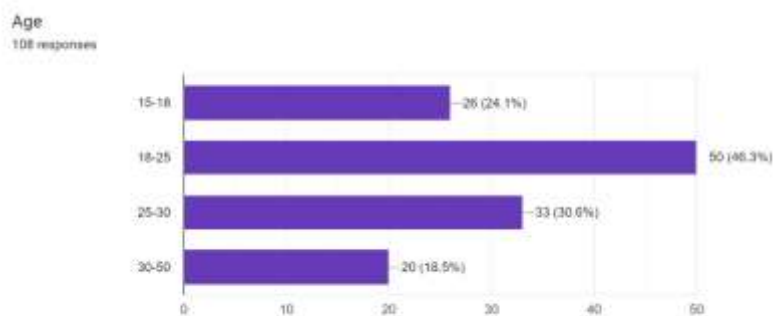
Solar Robot is planned to display two main behaviours: Obstacle avoidance and Light-seeking. The primary goal of any Phototropic (light-seeking) robot is to find and maintain access to a source of light (it's primary source of energy). The secondary goal is to keep from getting stuck. Your Solar Robot is equipped with optical sensors to find the light, and touch sensors to avoid any immediate obstacles. The optical sensors can sense obstacles by the shadow they cast, so your Solar Robot may occasionally surprise you with their adeptness. The power consumption of the robot is measured while the robot is driving in a plane soil bin with a speed of 0.3m/s. The soil in the bin was dry and very loose. The measurement device measured in DC voltage per current and made a measurement 2 times per second. The current was found and then the power was calculated with the battery voltage at 48V.

### Conclusion

Making a self-sustainable human-independent robotic system develops two main ideas. The first one is creating a robot that can work on some projects without any human help. The second one is using a renewable power source as main energy supplier. Combining these two concepts, very powerful robotic systems can be assembled contributing to the whole aspect of the life in future. This paper describes the beginning of the process in which a self-sustainable robotic system is created. This is a very stable platform which can be easily modified and upgraded. Adding new features, such as controller and sensors, will make this robot more intelligent and adaptive to the human needs.

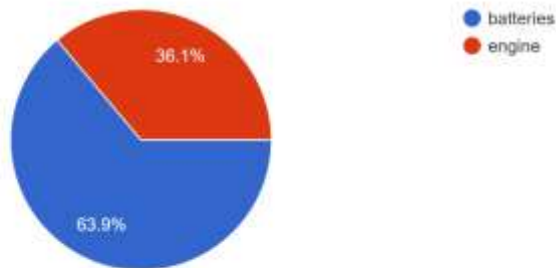
The robotic arm so far designed is able to lift the objects, in demand to extend its ability, more advanced system can be used. We conclude that the proposed system functions properly as the command is provided. The proposed system operates on Keys, as per the key is pressed the respective part of the arms move. The Electronic Circuit, to which the keys are connected, consists of an Arduino and RF transmitter. On pressing a particular key, we see the resultant movement on the system. Arduino tells the direction of movement of the motor and robotic arm as per the data received by Arduino via RF receiver. A renewable energy source is used to power up the Robot arm unit; solar panel converts sunlight into electrical energy. It can be used in military applications like bomb disposal, it allows interactivity in real-time with virtual objects, accurate control of tools during development, reduction in a number of peoples need for operation. Although the system is best suited for a different application it suffers from some limitations like complication in debugging issues as they involve real-time data analysis, the Full working of the robot is dependent on the range of RF transceiver.

### Figures and survey result



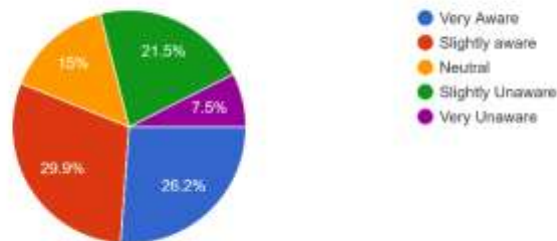
What is the best power source for robots?

108 responses



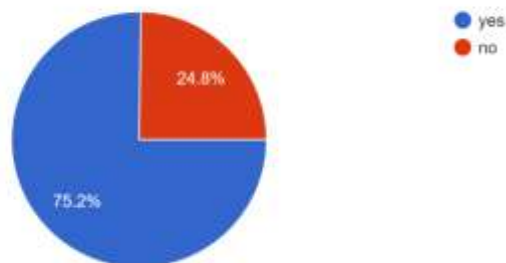
How aware is your organization about technologies used in solar energy?

107 responses



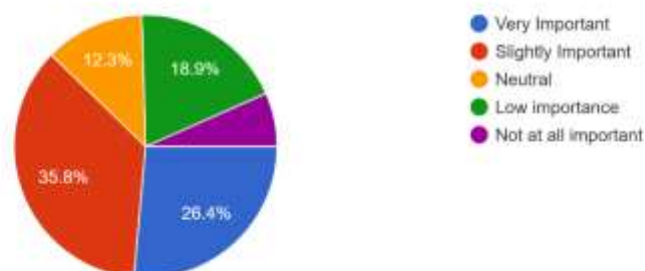
Do robots need batteries?

109 responses



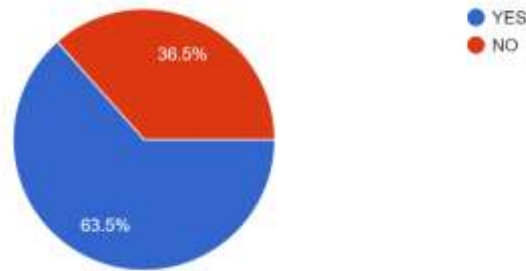
How important is it for your organization to contribute towards clean energy by investing in renewable sources such as solar?

106 responses



Do you know power is generated for the robot through the photovoltaic effect ?

104 responses



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