MARS ROVER BY SOLAR ENERGY

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ABSTRACT

Our main aim to design mars rover for planets explorationby with using of solar energy and to develop new android application for measuring temperature and humidity of planets . Design of Mars rover by solar panel with arduino. When a rover send to mars, which is more than 33 million miles from the earth, to make sure it has power for a long life. We can't replace the battery so 12V solar panel used to charge the battery. Our purpose is to increase the stability of the system by expanding its polygon which has been discussed here.design of wheel by using Pythagoras theorem using polyvinyl chloride materials and rubber tube material.rocker bogie mechanism is major support for this vechile.photovoltic cell is used for recharging the battery which gives long life for explorarion.

Keyword : - *solar energy ,android application,increase stability*

1. INTRODUCTION

Solar panel is used to charge the battery which can withstand for a long life. One major shortcomings which is its low average speed of operation, making the rocker-bogie system not suitable for situations where high-speed traversal over hard-flat surfaces is needed to cover large surface areas in short periods of time, mainly due to stability problems. Our purpose is to increase the stability of the rocker-bogie system by expanding its support polygon, making it more stable and adaptable while moving at high speed, but keeping its original robustness against obstacles. The rocker-bogie mobility system was designed to be used at slow speeds. It is capable of overcoming obstacles that are on the order of the size of a wheel. However, when surmounting a sizable obstacle, the vehicles motion effectively stops while the front wheel climbs the obstacle. Most of the benefits of this method can be achieved without any mechanical modification to existing designs-only a change in control strategy.

1.1 WORKPLAN

A solar panel with 12V used to recharge the rover when the battery is not operated. A solar panel used to get energy from the sun which is more efficient. Wheel alignments of mars rover changes regarding to increase their stability and high speed operation to cover the large area in short time.
The general photovoltaic process, as described above, works through the following steps:
1. The silicon photovoltaic solar cell absorbs solar radiation.
2. When the sun's rays interact with the silicon cell, electrons begin to move, creating a flow of electric current.
3. Wires capture and feed this direct current electricity to a solar inverter to be converted to alternating current electricity.

2. WHEEL ALINGMENT AND SLIP FACTOR

The objective of our work is stair climbing. To achieve proper stair climbing the dimensions of linkages should be proper. The rover must maintain good wheel traction in challenging rough terrains. If traction is too high, the vehicle consumes a lot of power if it is too low the rover is not able to climb over inclined surfaces. Slip occurs when the traction force at a wheel-terrain contact point is larger than the product of the normal force at the same wheel and the friction coefficient.

2.1 STABILITY

Lateral stability is computed by finding the minimum allowed angle on the slope before the rover tips over. Lateral stability is ensured if this angle is smaller than the maximum angle of incline alpha on the slope at the wheel-terrain contact points. Longitudinal stability of the rover make use of a static model , when all

wheels have ground contact and the condition Ni>0 is satisfied where Ni is the normal force at wheel i. The inertial force which cause a vehicle to sway on its suspension and roll over in extreme cases in response to cornering, rapid steering reversals or striking a tripping mechanism, when sliding laterally may be thought of as a force acting at the cog to pull the vehicle body laterally. A wider track width also increase the lateral force necessary to cause rollover by increasing the leverage of the vehicle's weight in resisting rollover, and that advantage also increase the computed value of mobility.

2.2 SOLAR PANEL AND BLUETOOTH

Solar panel used as backup charger for mars rover and it's stability is more. Bluetooth module is a hardware component used as wireless module for faster communication.
Bluetooth serial port communication used for receiving and sending data for exchanging information

3. POWER SUPPLY

The MER has to travel the surface of mars where there is no availability of power source thus it used solar cell to charge the battery and derive the power from the battery for the motors and other equipment. But since we are using the rover on the earth surface and our main focus is the development of mechanism rather than the power source so we will be using the cheapest possible alternative that is the 12 step down transformer and a full wave rectifier for converting the ac into dc supply the adequate power to all motors in connection.

3.1 CONTROL

The control of the rover will be manual with the hep of joysticks for driving each side of the rover separately. It will be helpful while taking a turn. All the connections will be wired and no wireless means will be used because we need to formulate the mechanism and not the actual rover and to make it cost effective in all possible manners

4. CONCLUSIONS

Use of battery and solar panel
Usage of solar panel is efficient for life time
Sensors are used to predict weather, water content
Life span of the rover increased so, we can monitor more time.
By developing the mobile application the information about weather condition can be easily predictable, and easy to monitor

5. REFERENCES

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