

**DESIGNING AND DEVELOPMENT OF A FULLY
AUTOMATED SOLAR-POWERED LAWN
MOWER**

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by

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Abstract

This Project aimed to design a fully automated solar-powered lawn mower (FASPLM) of electrical source to reduce the environmental pollution and use the natural resources in effective way. This device consisted of a square cross sectional cutting thread which is operated by the efficient powered motor and the power supply for the motor is given by a rechargeable battery. The battery can be charged by using a solar panel. The obstacles in the moving path of the mower can be sensed by an ultra-sonic distance sensor to avoid the obstacles in the track. Moreover, it has PIR sensors for detecting the human motion near the lawn mower. This design requires no perimeter wires to maintain the mower within the lawn and it will avoid and detect objects and human motion as it uses a self-localization platform with a global positioning system (GPS) module to travel and uses efficient cutting algorithms.

Initially, the market survey and literature survey were carried out to study the advantages and disadvantages of the existing devices. Then according to the survey results, a suitable platform for the lawn mower was designed. Thereafter, a detailed mechanical design and the mechanical structure were developed. Then the mechanical structure was fabricated, following that mechanical parts and the electronic wiring were assembled. The control algorithms and coding were written appropriately. Finally, manufactured equipment was tested in the field.

The major drawbacks of this device are with navigation control and duration of battery life. This lawn mower used GPS for localization and track following, coding and mechanical construction of GPS module is little difficult. Furthermore, during the long time of operation the battery discharging rate may be greater than the charging rate, therefore it is expected to use efficient motors, and efficient solar panels to keep the battery for long time operation.