

## Abstract

**Title** - Solar powered grinding machine for home gardening

**Introduction** - This thesis describes the design and construction of an automated eco-friendly grinding machine powered by solar energy for manufacturing soil nutrient/organic mulch for agriculture and home gardening. With an aim of this thesis is to weaken the rate of environmental pollution by introducing the use of eco-friendly machines over the use of internal combustion engines. The components used in the fabrication of this machine includes a solar panel, electric motor charge controller, grinding blade, battery, inverter

**Method** - Initially, the machines is exposed to solar rays in order to gain the energy required to power up the machine. Afterwards, this energy is used by the inverter in order to boost electricity for the machine. The charging controller of this machine is involved in order to prevent the overcharging of the battery. The mechanical section of this thesis involves the modeling and analysis of the grinding blade and the design of the hopper and the base frame according to the mechanical knowledge gained by researches. The automation of the project is done by using the automation software, Arduino.

**Result** - Mechanical results for the blade after the FEA revealed that the blade could resist the required maximum stresses. The automation results showed that the program was successful since the LCD display displayed the required precise information.

