



**UNIVERSITI TEKNOLOGI MARA CAWANGAN  
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**FINAL YEAR PROJECT 2 (EEE368)**

**REPORT**

**BLYNK ACTIVATED SOLAR PANEL SHINER  
USING ESP32 AS MICROCONTROLLER**

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## **ABSTRACT**

In its simplest form, solar energy is the act of using photovoltaic panels (PV) to either directly or indirectly transform solar energy into electrical power. Actually, the majority of the energy that humans can utilize on Earth comes from clean, green power. Solar energy holds the key to the future of power generation because of its ecologically beneficial nature. It's become well recognized as a practical instrument all throughout the world. A lot of research is being done to maximize the power that sunlight can provide, but some major obstacles to doing so are dust accumulation on solar panels and air pollution, which can reduce the energy output of solar cells by more than 25% and 40% in some parts of the world, including tropical nations like India. Periodic cleaning is necessary to maintain the proper operation of the solar energy production process, which is generated from the solar panels. Therefore, in this field, solutions like automatic cleaners are significantly needed to simplify, reduce time, and save manpower. This paper's primary goal is to develop a smart solar panel cleaner that can autonomously clean PV panel surfaces with water spray and a brush to ensure that any dirt is eliminated. In order to guarantee that the interior cleaning task is completed correctly, the ESP32 microcontroller in this system moves other parts like the dc motor and ultrasonic sensor. The intended system can now transmit data from input to output thanks to the usage of an ESP32 microcontroller. In this project, a whole prototype system is created, and its functionality is assessed.

## **ACKNOWLEDGEMENT**

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I want to start by expressing my gratitude to my family for their unwavering love, support, and inspiration over the past year. In addition, I would like to state that the Final Year Project is the best way for students to gain knowledge and confidence in their ability to create something using the electrical engineering curriculum. Without a doubt, receiving all of the help and inspiration from the people listed above will always be a special memory in our hearts. May God bless them.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Project Overview

This project uses the Internet of Things to create an autonomous cleaning robot. In order, the solar panels to maximize energy production, the system's level of cleanliness is crucial to the project. In addition, ultrasonic sensors will control the direction of the DC motor and the system can be operate using Blynk apps via mobile phone. The area that needs to be identified and cleaned will be determined by the ultrasonic sensor's distance measurement. The water level in the tank will be indicated by a signal sent by the LEDs attached to the water level sensor.

The LED light will continue blinking to indicating that the water needs to be refilled. Furthermore, to determine whether the system should run or stop due to the panel's efficiency at high temperatures, a humidity sensor is also used in this project. It is connected to the Blynk app on a smartphone, and it shows the panel's heat level. If water is added to the panel, this could potentially damage the panel and jeopardize its durability or lifetime of the material. Because of its lengthy surface and ability to thoroughly clean panels, the ultrasonic sensor-controlled system can only move forward and backward. The microcontroller will receive a signal to rotate in the opposite direction when the ultrasonic meets the panel's end. In order to completely clean the panel, this project also includes a brusher and a DC motor pump that transfer water from the tank to the panel.

By communicating wifi in this project, the ESP 32 are used to communicate microcontroller with the sensor. Users can also control the movement of the robot, which is used to turn on or off the system via a smartphone. Through the Blynk app, users can link this cleaning system to their smartphones. The user can decide whether to start the system by phone, which will display the panel's temperature and water level. The system's overall benefits include the ability to finish cleaning a large number of solar panels and the advantage of short usage.