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DEPARTMENT OF CSE

ACADEMIC YEAR: 2023-2024

**MAJOR PROJECT WORK DETAILS AND ABSTRACT**

**Title of the Project**: IOT BASED SOLAR POWER MONITORING SYSTEM

**Project Associates:**

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Signature of Guide



**Abstract:**

Renewable energy sources are proven to be reliable and accepted as the best alternative for fulfilling our increasing energy needs. Solar photovoltaic energy is the emerging and enticing clean technologies with zero carbon emission in today's world. To harness the solar power generation, it is indeed necessary to pay serious attention to its maintenance as well as application. The IoT based solar energy monitoring system is proposed to collect and analyzes the solar energy parameters to predict the performance for ensuring stable power generation. The main advantage of the system is to determine optimal performance for better maintenance of solar PV (photovoltaic). The prime target of PV monitoring system is to offer a cost-effective solution, which incessantly displays remote energy yields and its performance either on the computer or through smart phones. The proposed system is tested with a solar module of 125- watts to monitor string voltage, string current, temperature, and irradiance. This PV monitoring system is developed by a smart Wi-Fi enabled CC3200 microcontroller with latest embedded ARM processor that communicates and uploads the data in cloud platform with the Blynk application. Also the Wireless monitoring system maximizes the operational reliability of a PV system with minimum system cost

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**Problem Statement:**

An loT-based solar power monitoring system to enhance renewable energy management. The project aims to create a real-time monitoring solution for solar panels, inverters, and related components. Challenges include robust data collection, remote accessibility, energy efficiency optimization, integration with weather data, user-friendly data visualization, scalability, and cost-effectiveness. The system should offer predictive maintenance, security measures, and compatibility with various solar configurations. The outcome will be an efficient, remotely accessible solar power monitoring system that maximizes energy production, contributing to sustainable and reliable renewable energy sources

# **HARDWARE REQUIREMENTS:**

1. ESP32 Wifi Module
2. Solar Panel(3-25V)
3. Voltage Sensor Module
4. LM35 Temperature Sensor
5. Resistor 2.2K
6. Micro USB Data cable

**SOFTWARE REQUIREMENTS:**

1. Arduino IDE – 1.8.16
2. RAM – 4 to 8 GB minimum
3. Operating System
4. Python – 3.10.0
5. The open-source Arduino Software (IDE)

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**References:**

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