VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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MINI PROJECT REPORT

OF

SOLAR PANEL TRACKING SYSTEM

Submitted by

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Under the Guidance

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CERTIFICATE

Certified that the mini project work entitled ***"LINE FOLLOWER ROBOT"*** *is a bonafide work carried out by*

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in partial fulfilment for the award of **BACHELOR OF ENGINEERING** in **INFORMATION SCIENCE AND ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM** during the year 2022-2023 It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the Bachelor of Engineering Degree.

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Project Guide

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ABSTRACT

In recent years, the utilization of solar panels to convert solar energy into electrical energy has seen a significant increase. Solar panels offer a versatile solution, as they can be employed as stand-alone systems or integrated into large solar systems that are connected to electricity grids. With the Earth receiving a staggering 84 Terawatts of solar power, and global energy consumption hovering around 12 Terawatts per day, there is a growing endeavor to harness more energy from the sun through the use of solar panels. To maximize the conversion efficiency from solar to electrical energy, it is crucial to ensure that the solar panels are positioned perpendicularly to the sun's rays. By doing so, they can capture the maximum amount of sunlight and convert it into usable electricity. Therefore, precise tracking of the sun's location and continuous adjustment of the solar panel's orientation become vital factors in achieving optimal energy production. The primary goal of this project is to design an automatic tracking system that accurately determines the position of the sun throughout the day. By knowing the sun's position, the tracking system will dynamically adjust the solar panel's alignment, ensuring it remains perpendicular to the sun's rays at all times. This continuous optimization allows for maximum energy conversion and significantly enhances the overall energy output of the solar panel system.

To achieve this, the automatic tracking system will utilize photoresistors as sensors. These photoresistors are light-sensitive components that detect the intensity of sunlight, providing real-time data to the system. The core components of the automatic tracking system will include a light sensing system, a microcontroller (responsible for processing the sensor data and controlling the movements), a gear motor system (to physically adjust the position of the solar panel), and, of course, the solar panel itself. The proposed automatic tracking system offers a substantial advantage over traditional fixed solar panels that do not adjust their orientation. The system's dynamic adjustment capability ensures that the solar panel is always optimally positioned to capture the most sunlight throughout the day. As a result, the system is expected to generate up to 40% more energy compared to non-tracking solar panels, making it a highly efficient and environmentally friendly energy production solution...