VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI-590018

Mini Project Report On

"Servo Based Distance Indicator"

A report submitted in partial fulfillment of the requirements for

MINI PROJECT

In

Computer Science and Engineering (IOT , Cyber Security including Blockchain Technology)

Submitted by

DIKSHITA DEVADIGA	**4AL22IC011**
SHILPA A	**4AL22IC040**
THANVI SHETTY	**4AL22IC057**

Under the Guidance of

Dr. Rachana P

Associate Professor

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (IOT , CYBER SECURITY INCLUDING BLOCKCHAIN TECHNOLOGY)

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MOODBIDRI-574225, KARNATAKA

2023 – 2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. - 574225

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(IOT , CYBER SECURITY INCLUDING BLOCKCHAIN TECHNOLOGY)

CERTIFICATE

This is to certify that the Project entitled **"SERVO BASED DISTANCE INDICATOR"** has been successfully completed by

DIKSHITA DEVADIGA	4AL22IC011
SHILPA A	4AL22IC040
THANVI SHETTY	4AL22IC057

the bonafide students of **Department of Computer Science & Engineering (IOT , Cyber Security including Blockchain Technology), Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (IOT , CYBER SECURITY INCLUDING BLOCKCHAIN TECHNOLOGY)** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–2024. 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.

Dr. Rachana P
Project Guide

Dr. Pradeep V
HOD CSE(ISE/ICB)

H. O. D.
Dept. Of Information Science & Engineering
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

ABSTRACT

Accurate distance measurement systems are integral to various fields, including robotics, industrial automation, automotive safety, and smart infrastructure. This mini-project explores the development of a "**Servo-Based Distance Indicator**", which combines the precision of ultrasonic sensors with the real-time responsiveness of servo motors to provide an intuitive and reliable representation of spatial measurements. The system is designed to capture distance measurements using an ultrasonic sensor, which emits ultrasonic waves and measures the time taken for the reflected wave to return. This data is processed by a microcontroller, converting the measured distance into corresponding angular positions of a servo motor. The servo motor's movements visually represent the detected distance, offering an effective mechanism for understanding spatial changes.

A significant focus of the project is addressing practical challenges such as environmental noise, system calibration, and real-time responsiveness. The system undergoes rigorous testing, including accuracy evaluation to ensure precise distance measurements, response time analysis to validate its real-time capabilities, and robustness checks under various environmental conditions. The results indicate that the system is capable of maintaining high reliability and performance across diverse scenarios. Furthermore, the project emphasizes optimizing system efficiency by minimizing power consumption and computational overhead.

These enhancements make the Servo-Based Distance Indicator suitable for real-time applications where efficiency and reliability are paramount. Potential use cases include obstacle detection and avoidance in robotics, parking assistance in automotive systems, and safety monitoring in industrial automation. The Servo-Based Distance Indicator also lays a strong foundation for future advancements. By incorporating wireless communication or IoT features, the system could enable remote monitoring and control. Additionally, integrating adaptive algorithms powered by machine learning could further enhance its functionality, making it capable of operating in complex environments.

In conclusion, this project successfully demonstrates the practicality and versatility of the Servo-Based Distance Indicator as a reliable tool for real-time distance measurement and visualization. The system offers a scalable solution to address the growing demand for intelligent automation in various industries and real-world applications.