VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama" Belagavi – 590 018

PROJECT REPORT ON

"DESIGN AND IMPLEMENTATION OFA SELF DRIVEN VEHICLE WITH COMPUTER VISION -A PROTOTYPE"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING

IN

ELECTRONICS & COMMUNICATION ENGINEERING

Submitted By

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

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Shobhavana Campus, Mijar – 574225

2023 - 2024

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the project work entitled "**DESIGN AND IMPLEMENTATION OF A SELF DRIVEN VEHICLE WITH COMPUTER VISION -A PROTOTYPE**" *is a bona fide work carried out by*

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in partial fulfillment for the award of **BACHELOR OF ENGINEERING** in **ELECTRONICS & COMMUNICATION ENGINEERING** 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.

D.V.M — Siddesh —

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ABSTRACT

Computer vision technology has witnessed significant advancements, particularly in the context of self-driving vehicles. We've developed a hardware solution for enhancing autonomous driving capabilities. Our system integrates multiple sensors, including ultrasonic, camera, and Bluetooth modules, to detect lanes, obstacles, and traffic elements in real-time. Processing this environmental data efficiently is crucial, so we leverage advanced GPUs provided by the Google Collab platform. These GPUs enable swift processing, allowing the autonomous system to make rapid decisions for safe navigation. Trained a custom object detection model utilizing the Huigh transformation algorithm. This model enables accurate detection of objects in real-world scenarios. Additionally, we have incorporated actuators to control DC motor rotations, facilitating precise locomotion control of the vehicle. Our project is geared towards enhancing the safety and reliability of self-driving vehicles by augmenting their ability to perceive and respond to dynamic environmental conditions.

This project presents the hardware implementation of a self-driving vehicle prototype, focusing on real-time control mechanisms. The system processes video feeds using a custom algorithm, resulting in a directional value ranging from -0.99 to -0.01 for leftward movement, 0.01 to 0.99 for rightward movement, and 0 for straight movement. Additionally, object detection capabilities are integrated, halting locomotion upon detection.