

Autonomous Navigation Bot

Yash Dattatraya Desai¹, Sahil Santosh Ratnaparkhi², Vitthal Pratap Jadhav³,

Gauri Laxman Raut⁴, Prof. Deepa H. Kulkarni⁵

Students, Department of Computer Engineering^{1,2,3,4}

Professor, Department of Computer Engineering⁵

Smt. Kashibai Navale College of Engineering, Pune, Maharashtra, India

Abstract: This article presents an innovative concept for an autonomous vehicle that operates and navigates without human intervention. The proposal involves constructing a 1/10 scale RC car that utilizes an array of sophisticated software and hardware components, including a Convolutional Neural Network (CNN), an Arduino UNO Board, an NVIDIA Jetson Nano board, a camera, an ultrasonic sensor, a gyroscope, an accelerometer, an Electronic Speed Controller (ESC), a BLDC motor, and a servo motor. The camera and ultrasonic sensor are integrated with the Arduino UNO board to provide input data for the CNN running on the Jetson Nano. This enables the vehicle to detect and classify objects in real-time and make informed navigation decisions. The ultrasonic sensor, located at the front of the vehicle, plays a crucial role in collision avoidance by halting the vehicle before reaching a certain distance from an obstacle. The Jetson board sends a signal to the BLDC motor to stop the vehicle when required. To achieve real-time object detection and obstacle avoidance, the vehicle employs a highly advanced system that utilizes both the camera and ultrasonic sensor.

Keywords: autonomous, real-time object detect, Convolutional Neural Network, YOLOv7, obstacle avoidance. BLDC motor, ESC

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