

ROBOSCOUT: A WIRELESS ROVER WITH CAMERA FEED AND ROBOTIC ARM

18EE810 Project

*Submitted in partial fulfillment for the requirement of B.E. degree in
Electrical and Electronics Engineering of Anna University*

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CERTIFICATE

Certified that this is a bonafide record of the 18EE810 Project & Viva Voce done by **Mr. ASHISH KUMAR DUTTA** (20E012), **Mr. MOHAMMED SOHAIL SHEIKH** (20E049) and **Mr. KAMALESH A** (20E033) of Eighth Semester B.E. Electrical and Electronics Engineering during the year 2023 - 2024.

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INTERNAL EXAMINER

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EXTERNAL EXAMINER

CERTIFICATE

This is to certify that the **18EE810** Project Work Report entitled ***“RoboScout: A wireless rover with camera feed and robotic arm”***, being submitted by **Mr. ASHISH KUMAR DUTTA, Mr. MOHAMMED SOHAIL SHEIKH and Mr. KAMALESH A** in partial fulfillment for the requirement of **Bachelor of Engineering Degree in Electrical and Electronics Engineering**, is a record of bonafide work. The results embodied in this report have not been submitted to any other university or institute for the award of any degree or diploma.

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LIST OF SYMBOLS

Symbols & Acronyms	Description
EVs	Electric vehicles
BLE	Bluetooth low energy
μ C	Micro controller
IDE	Integration development environment

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ABSTRACT

The integration of robotics into various fields has revolutionized how tasks are accomplished, particularly in scenarios where human intervention is challenging or impossible. This report presents a comprehensive exploration of a rover equipped with a camera and a robotic arm, controlled wirelessly through ESP32 modules. This innovative rover is named – ‘RoboScout’ and it embodies advanced technological capabilities tailored for diverse applications such as reconnaissance, surveillance, disaster response, and industrial automation. The project consists of two primary parts: the rover and the controller, both utilizing ESP32 boards for wireless communication. The rover serves as the physical platform housing the camera and robotic arm, while the controller acts as the interface for remote operation. The rover functionalities are divided into stages of development, each introducing new features and capabilities. In the initial stage, basic rover movement is facilitated through a joystick, allowing for precise control in four directions. The ESP32 module interprets commands transmitted from the controller module, enabling smooth motion using the L298N motor driver. Additionally, ultrasonic sensors integrated into the rover module to detect obstacles and alert the operator via a buzzer. Stage two marks a significant advancement with the incorporation of real-time camera feed functionality. An ESP32 CAM module with servo motors, enables dynamic two-axis movement of the camera. The operator can adjust the camera's orientation, granting a comprehensive view of the rover's surroundings. The camera feed is accessible within a private network via an IP address. In the final stage of development, the rover's capabilities are further expanded with the integration of a robotic arm. The arm offers a wide range of manipulation abilities crucial for various tasks. The Wireless Rover Explorer represents a significant advancement in remote exploration and intervention technologies, offering unparalleled versatility and adaptability across a wide range of scenarios. This report serves as a comprehensive guide to the design, implementation, and potential applications of the Wireless Rover Explorer, highlighting its pivotal role in pushing the boundaries of remote robotic