

# **Integrated Surveillance System Using License Plate Recognition**

## **Abstract**

This project presents an integrated surveillance system leveraging advanced license plate recognition (LPR) technology. The primary objective is to develop a robust platform capable of efficiently identifying and tracking vehicles based on their license plates, thereby enhancing surveillance capabilities in various contexts. The system utilizes Raspberry Pi 5 as its core computing platform, running PyTorch for deep learning-based object detection and recognition tasks. Specifically, the YOLOv8 model based on Convolutional Neural Networks is employed for initial object detection, followed by fine-tuning through transfer learning to specialize in license plate recognition. An Optical Character Recognition (OCR) model is then applied to extract alphanumeric characters from the identified plates. The collected data, along with corresponding timestamps and location, is stored in a database for organized retrieval and analysis. Additionally, a web interface is developed using React and Django, facilitating monitoring of surveillance data. This integrated system offers promising applications in security enforcement, access control, providing valuable insights and actionable information for surveillance operations. The utilization of PyTorch on Raspberry Pi 5 provides a portable and efficient platform for running complex deep learning models in resource-constrained environments.

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