LICENSE PLATE DETECTION USING AI

By Chris, Kyle, Honor & Naimul

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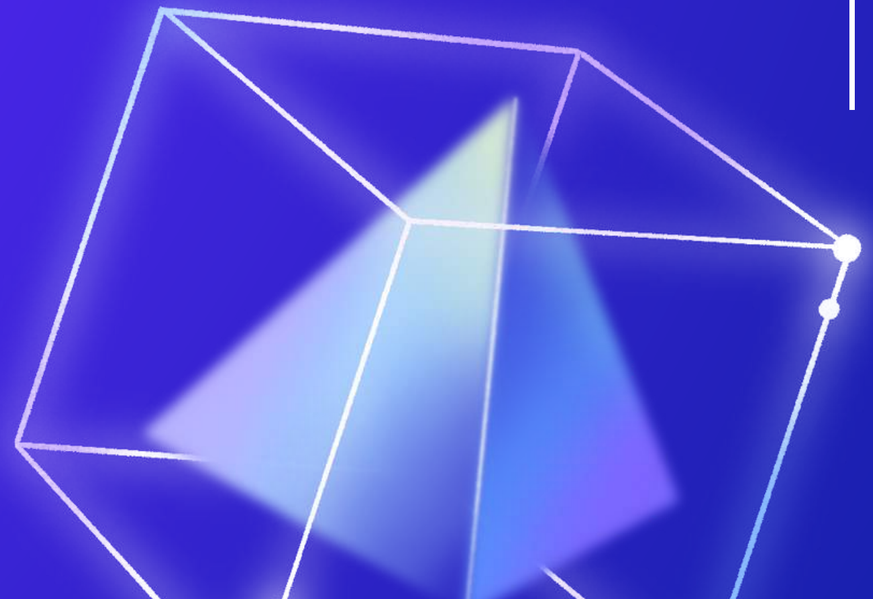


INTRODUCTION

Welcome, everyone!

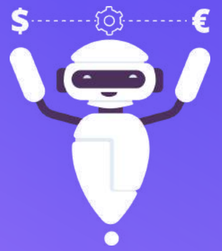
Today, we'll be discussing about our License Plate Detection project. This project brings together EasyOCR and YOLOv9, two smart technologies that are great at reading letters and finding objects. By using these tools, our system can identify license plates in pictures, videos, and even live camera feeds.

With precise letter reading and reliable object detection, it can help with tasks like policing and traffic management. This project showcases possibilities of a safer and more organized world powered by intelligent technologies. Let's explore how our project aims to make a difference!

PROJECT OBJECTIVES

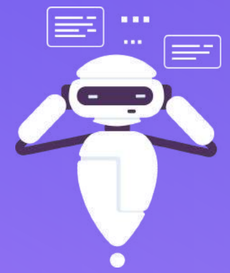
IMPLEMENT AI IN LICENSE PLATE DETECTION

Develop a robust system capable of accurately detecting license plates from images, videos, and live webcam feeds using machine learning algorithms



VERSATILITY AND ADAPTABILITY

Ensure that the system can adapt to different environments and lighting conditions, providing consistent performance across diverse scenarios such as day and night, indoor and outdoor settings.



REAL-TIME RECOGNITION

Enable the system to provide real-time solutions for license plate recognition, ensuring quick and efficient processing of data streams from live webcam feeds and video sources.

CONTINUOUS LEARNING

Feedback loop facilitates continuous enhancement, enabling the system to remain effective and up-to-date in dynamic environments, ultimately enhancing its practical utility and performance over time.

INCREASED EFFICIENCY

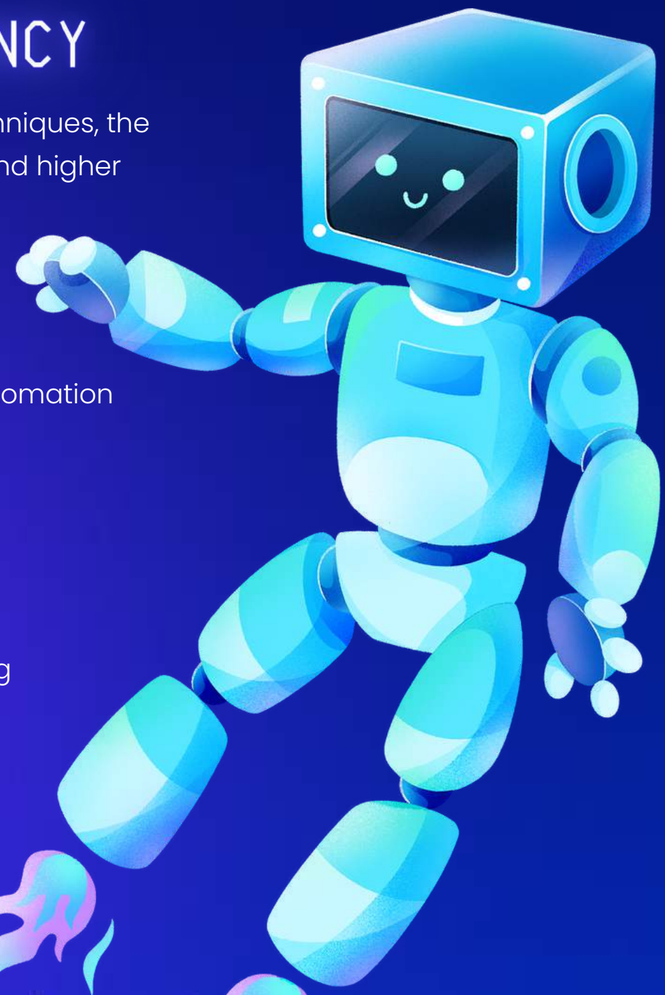
By leveraging advanced algorithms and techniques, the system achieves faster processing speeds and higher accuracy rates.

AUTOMATION

By eliminating the need for manual input, automation enhances system efficiency and reliability.

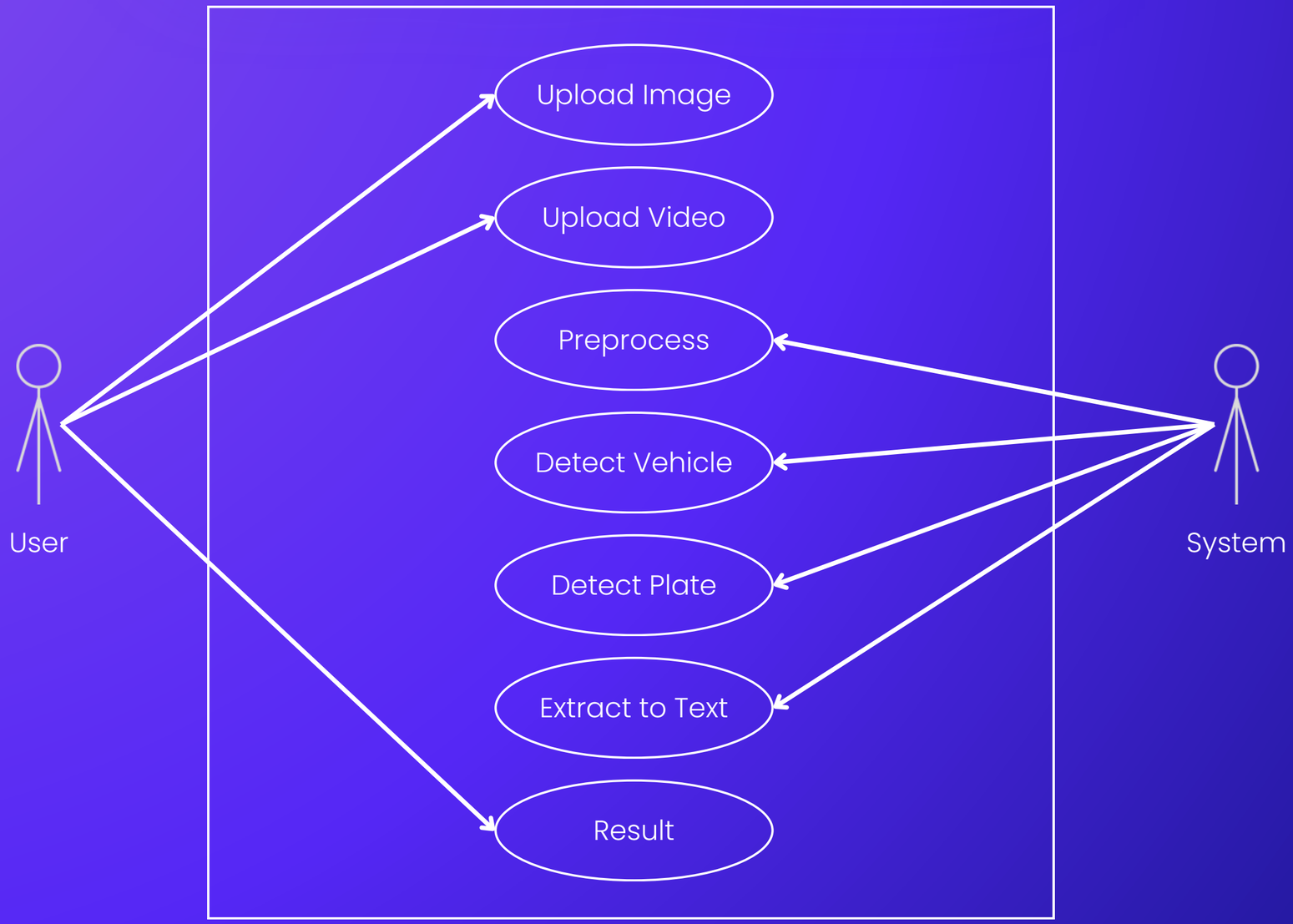
ENHANCED ACCURACY

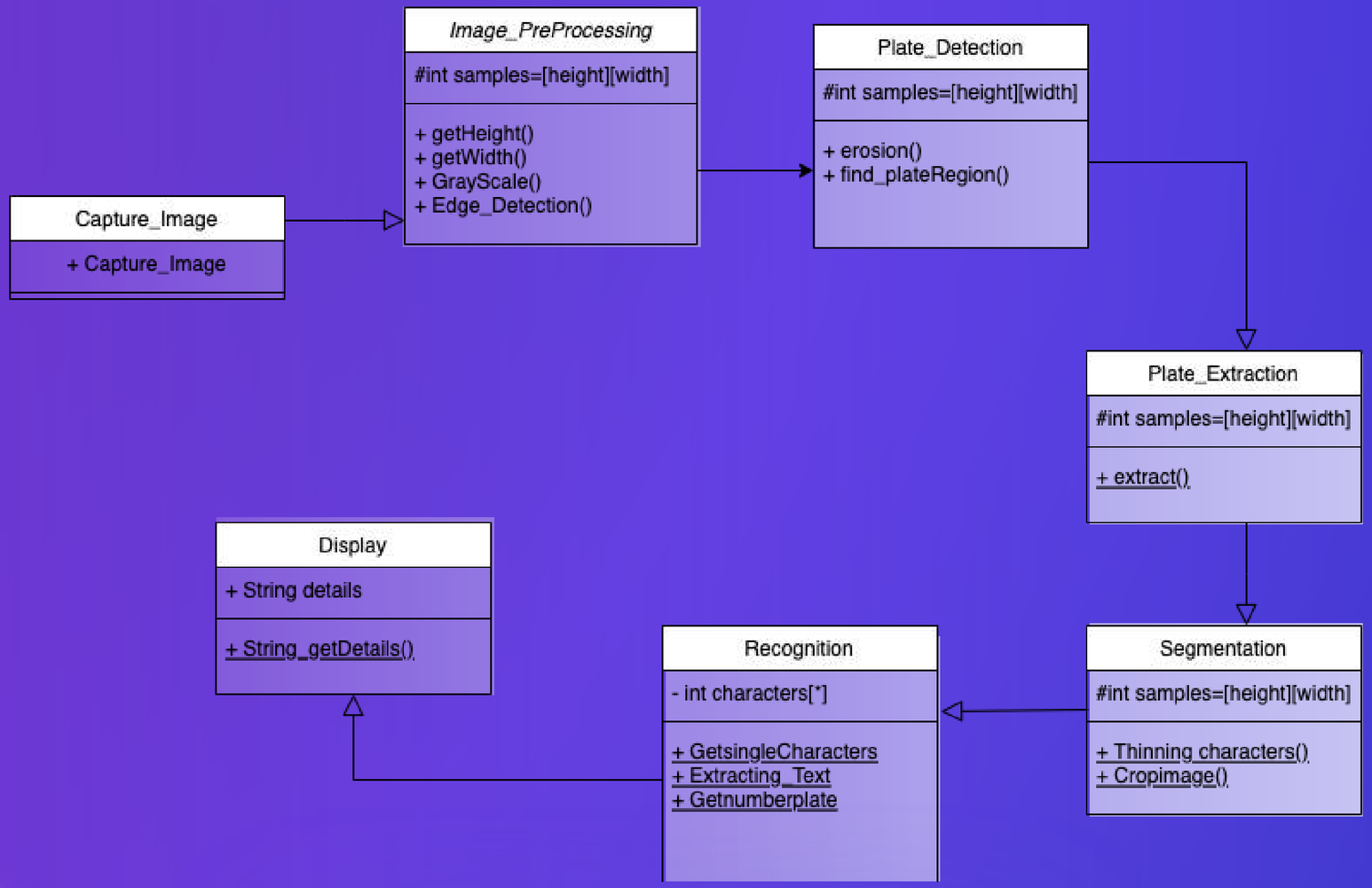
Fine-tuning parameters and incorporating feedback from real-world data enhance accuracy rates, reducing false positives and negatives.



USE-CASE SCENERIOS

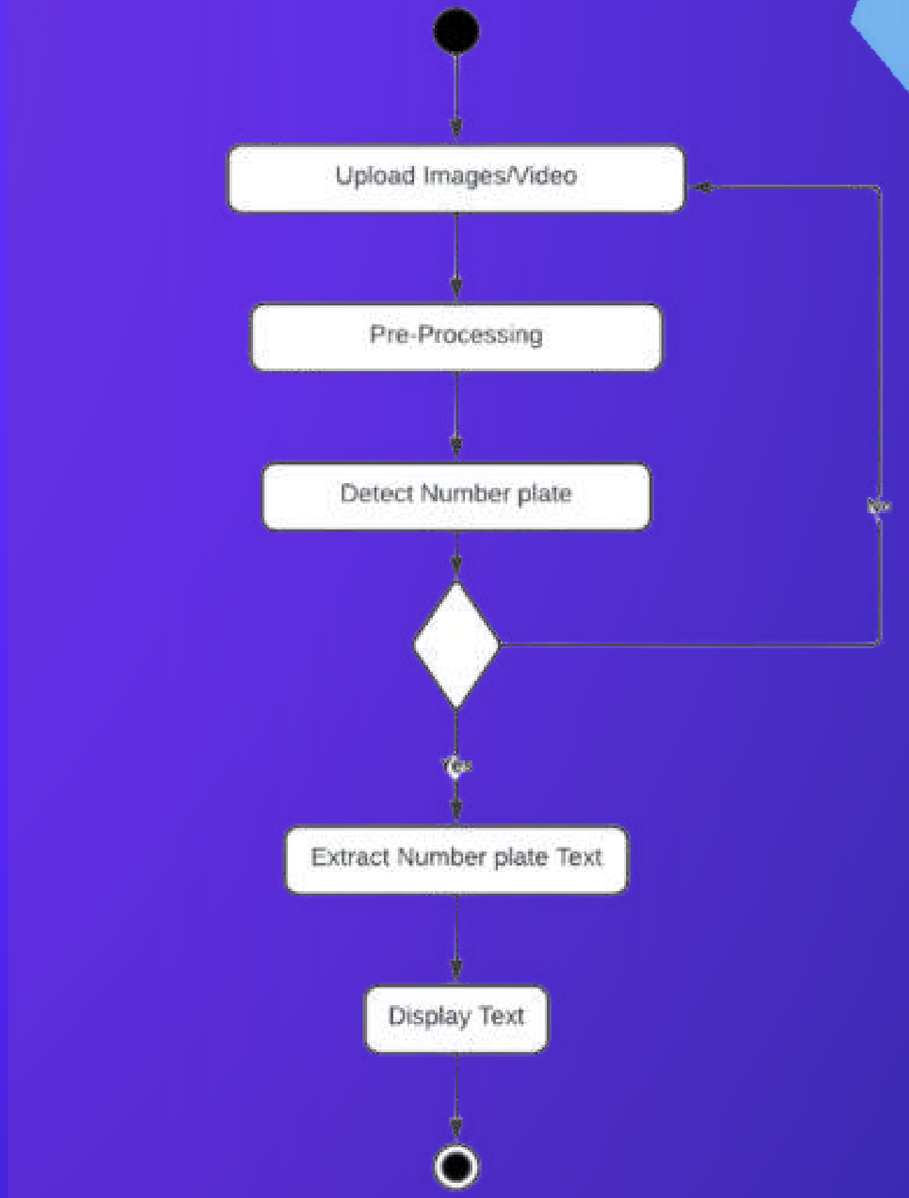
USE-CASE DIAGRAM





CLASS DIAGRAM

ACTIVITY DIAGRAM



PROJECT TIMELINE

01

Project Initiation

- Define project scope and objectives.
- Research YOLOv9 and EasyOCR integration.
- Set up development environment.

02

Model Development

- Train YOLOv9 model for license plate detection using labeled datasets.
- Integrate EasyOCR for license plate number recognition.
- Test model performance on various image and video datasets

03

Implementation

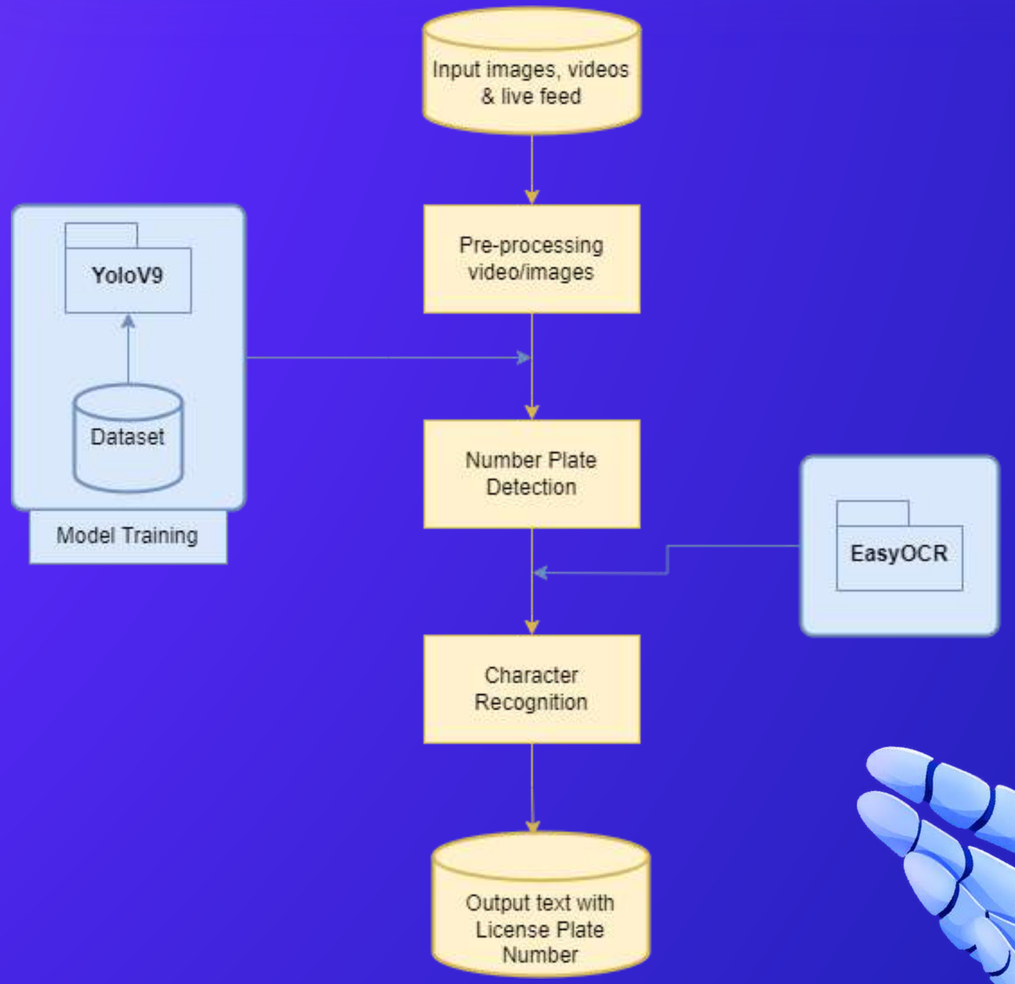
- Develop to detect license plates from images, videos, and live webcam feed.
- Implement functionality to read and display detected license plate numbers.

04

Testing

- Gather feedback and fine-tune the system based on test results.
- Ensure system compatibility and optimize for real-time performance.
- Prepare documentation

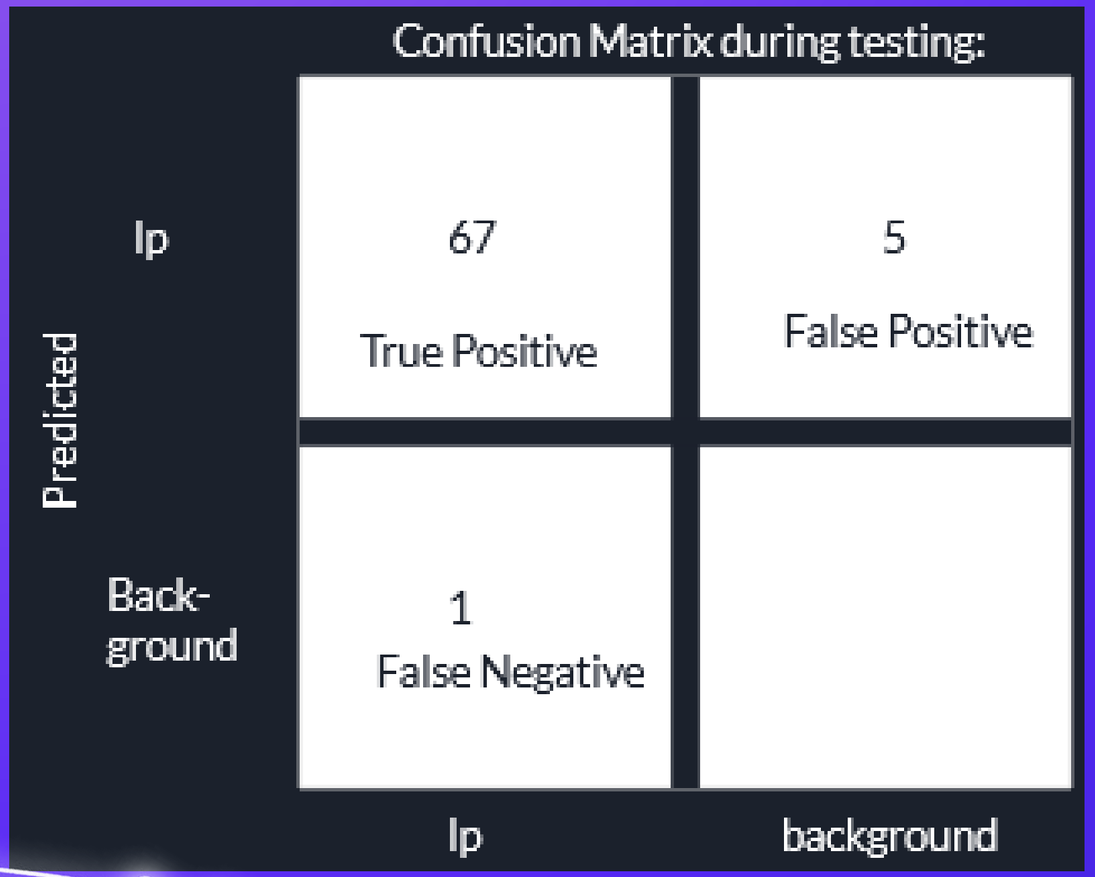
TECHNICAL ARCHITECTURE

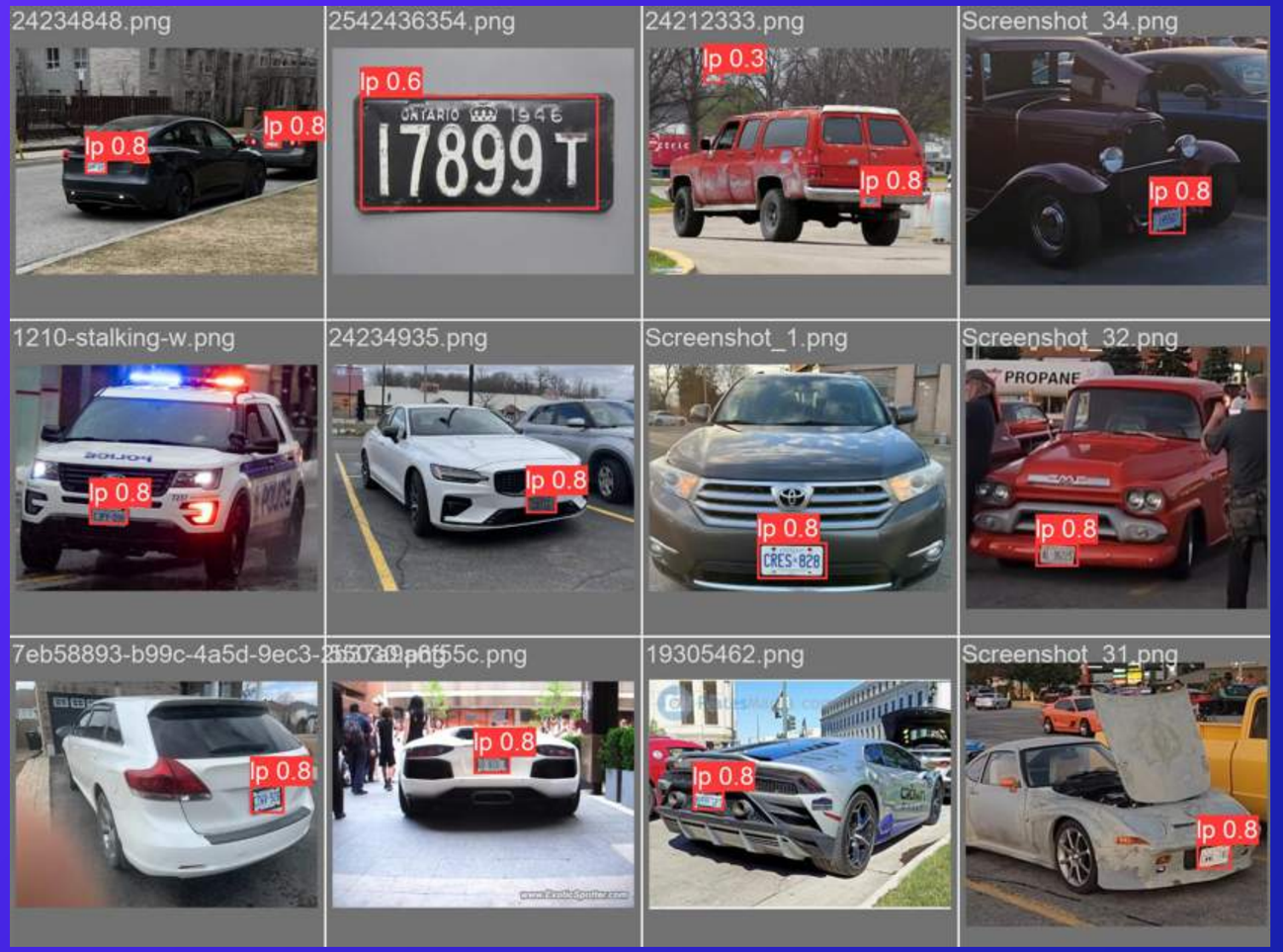


RESULTS

Model Performance - YOLOv9

The YOLOv9 model is used for detecting where a license plate is in an image and cropping it so the OCR can be used. This model was able to identify 99% of license plates in our tests.





Model Performance - OCR

Our model is able to detect many different license plates, including the new blue Ontario license plates and license plates from other provinces.

Example License Plate Readings:

Model Limitations: EasyOCR

One bottleneck with our License Plate Reader is the EasyOCR library which is used to read the text of the license plate

In certain lighting conditions and angles, this OCR does not perform well.
To improve the accuracy of our model, we could employ a higher-accuracy OCR module to improve text detection.

Examples where the OCR failed:

THANK YOU!