

Performance Report – Number Plate Detection System

1. Object Detection Performance (YOLO)

- Precision: 0.7992
- Recall: 0.7179
- mAP@50: 0.7434
- mAP@50-95: 0.3816

2. Bounding Box Accuracy

- IoU: 0.8177

3. Error Rates

- True Positives: 46
- False Positives: 8
- False Negatives: 9
- False Positive Rate: 0.148
- False Negative Rate: 0.164

4. Inference Speed

- Inference Time: 13.2 ms per image

5. OCR Summary

OCR works well on clearly visible plates but may struggle on blurry or low-light images.

Final Overview

The Number Plate Detection System demonstrates strong performance in real-time environments with accurate plate localization and fast inference. The YOLO detection model achieves high IoU and good mAP scores, showing reliable bounding box predictions. While OCR accuracy is acceptable for clear images, further refinement may improve performance under challenging lighting or low-resolution conditions. Overall, the system is suitable for practical applications such as surveillance, parking systems, and traffic monitoring.