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License Plate Detection

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**Morning Group A
Third Stage**

Introduction

This project focuses on building an AI system that can automatically detect a vehicle's license plate and read the plate number from an image.

The system combines YOLO for object detection and EasyOCR for text recognition

Problem Definition

Automatic license plate recognition is widely used in parking systems, traffic monitoring, and security.

The challenge is to accurately detect the plate in different lighting, angles, and image qualities.

Our goal is to create a simple Python-based system that detects the plate and extracts its text.

Dataset

We used the Car Plate Detection dataset from Kaggle.
The dataset contains labeled images of cars.

Converted annotations from XML to YOLO format

Split the data into:

Train: 80%

Validation: 20%

One class was used: “licence”

Method

1- YOLO Detection

YOLOv8 was trained to detect the plate's bounding box in each image. The model learns the shape and location of license plates and outputs a detection box.

2- OCR Extraction

After detection:

We crop the plate area using OpenCV

Apply EasyOCR to read the plate number

Display the result on the image

Implementation

We used Python with the following libraries:

OpenCV: image processing

YOLO (Ultralytics): plate detection

EasyOCR: text recognition

Matplotlib: display

Tkinter: choose an image from the device

The program loads an image → detects the plate → reads the text → shows the result

Results

The model successfully detected plates in most test images.

OCR worked well on clear and visible plates.

Accuracy improves with more training images and better annotations

Conclusion

We built a functional license plate detection system using YOLO and EasyOCR.

The project demonstrates a real-world application of AI and computer vision.

Future improvements may include:

More training data

Better OCR accuracy

Supporting different plate formats