

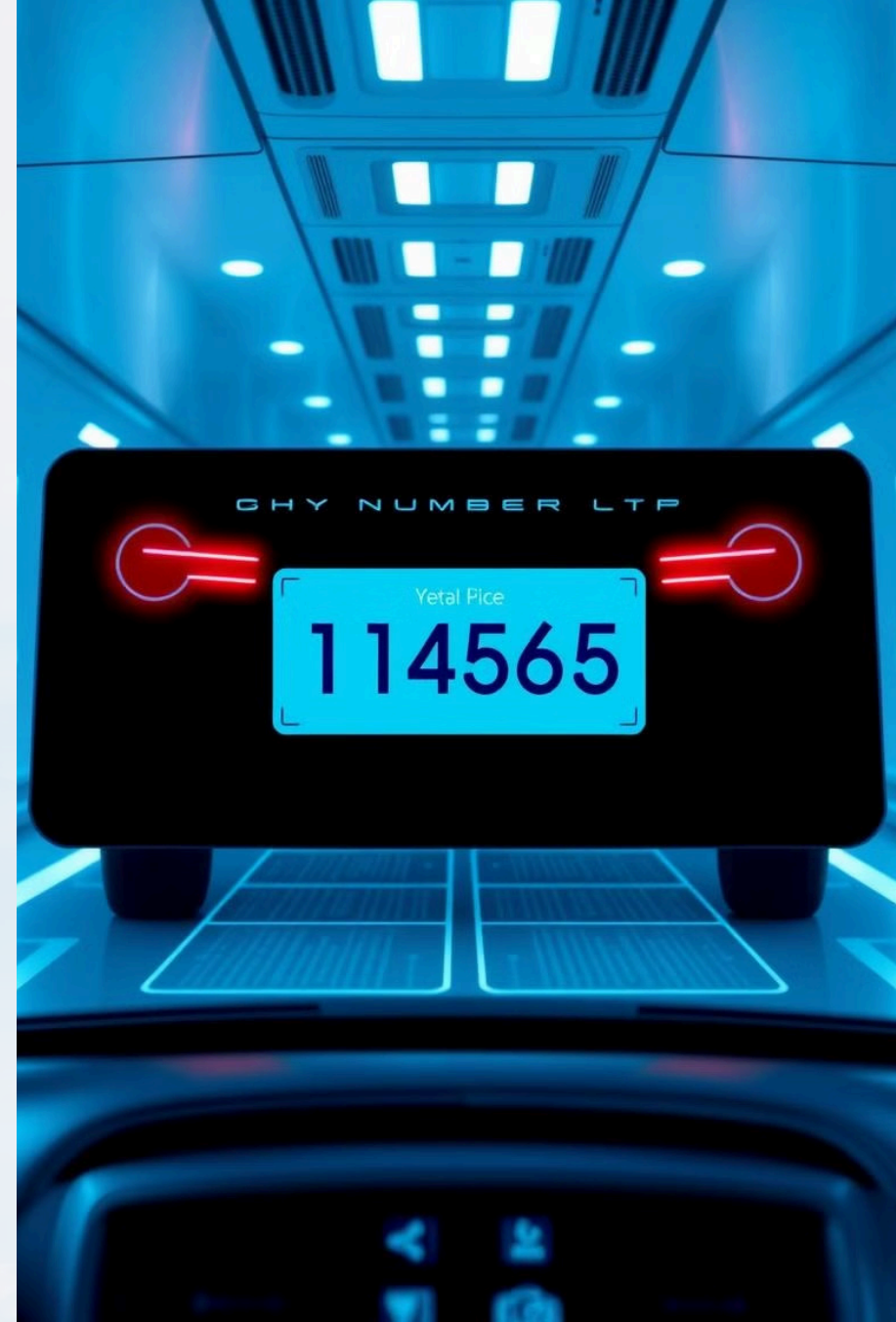
NUMBER PLATE RECOGNITION

This presentation outlines a comprehensive approach to extracting and identifying vehicle license plate numbers from images.



Description

This project leverages Optical Character Recognition (OCR) to extract and identify vehicle license plate numbers from images. The system combines image processing techniques with OCR technology to create an efficient solution for various traffic management applications.





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Project Objectives

1 Accurate Detection

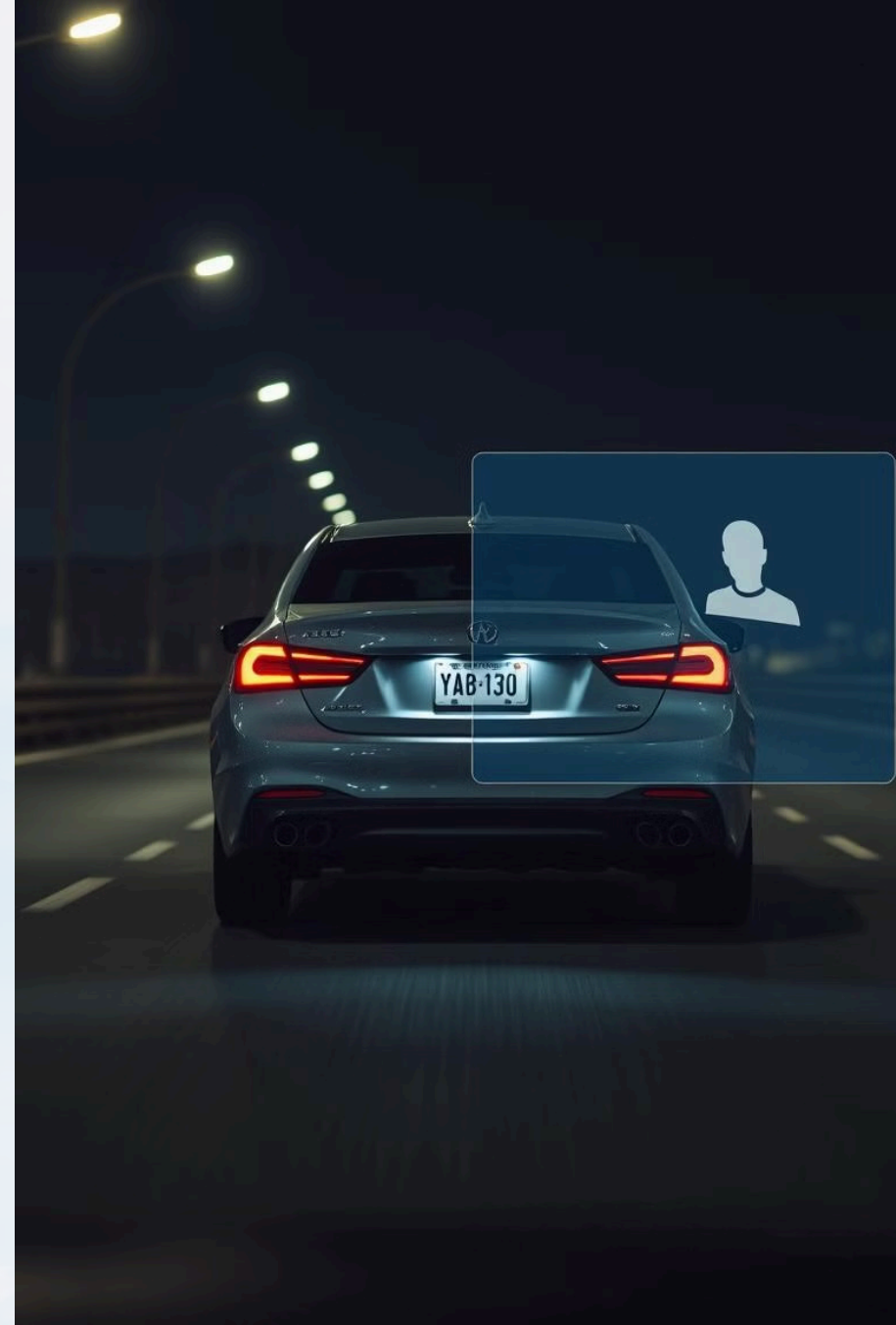
Develop robust algorithms to detect number plates in various conditions.

2 Character Extraction

Implement OCR technology to accurately interpret characters from detected plates.

3 User-Friendly System

Create an intuitive interface for seamless integration with existing traffic management systems.





Technology Stack

Python

Core programming language chosen for its versatility and extensive library support.

OpenCV

Utilized for advanced image processing and pre-processing of input images.

EasyOCR

Employed for efficient character recognition from processed number plate images.

NumPy & Matplotlib

Used for array manipulations and result visualization respectively.

Image Acquisition and Preprocessing

1

Image Capture

System acquires images through live video feed or pre-stored image files.

2

Grayscale Conversion

Images are converted to grayscale for simplified processing.

3

Thresholding

Binarization enhances contrast between plate and background.

4

Edge Detection

Canny edge detection identifies plate boundaries for accurate localization.



Number Plate Detection

1

Contour Detection

Algorithm identifies closed shapes in the processed image.

2

Bounding Box

Rectangular regions are drawn around potential number plate areas.

3

Plate Extraction

The identified plate area is cropped for further OCR processing.



OCR Implementation

EasyOCR Processing

The OCR model analyzes the cropped plate image. It identifies individual characters and converts them to text.

Character Segmentation

Advanced algorithms separate each character for improved recognition accuracy. This step handles varying plate styles and fonts.

Text Output

The final output is a string of alphanumeric characters representing the license plate number.



Post-Processing and Results

Input Image	Detected Plate	OCR Output
Vehicle on road	Cropped plate image	AP 19 EQ 0001

Challenges and Future Work

Skewed Plates

Implementing perspective correction algorithms to handle angled number plates.

Lighting Conditions

Developing adaptive thresholding techniques for varying light scenarios.

Deep Learning Integration

Exploring CNN models to enhance detection accuracy and speed.

Real-Time Processing

Optimizing the system for faster processing in live video streams.



Conclusion

1 Efficient Solution

The system successfully extracts and recognizes characters from vehicle number plates.

2 Practical Application

Demonstrates the real-world utility of OCR technology in traffic management.

3 Future Potential

Sets the foundation for advanced, AI-driven traffic monitoring and vehicle identification systems.

