Automatic Number Plate Recognition

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Abstract – Automatic Number Plate Recognition (ANPR) is a computer vision-based system designed to detect and recognize vehicle license plates from images or video frames. It automates vehicle identification for traffic management, law enforcement, and access control. The system captures an image, locates the plate, segments characters, and uses OCR to extract the alphanumeric data. Machine learning enhances accuracy in diverse conditions such as varying lighting and plate styles. ANPR operates in real time, ensuring fast and efficient processing. It reduces manual intervention, improves surveillance, and supports intelligent transportation systems.

Keywords – Automatic Number Plate Recognition (ANPR), License Plate Detection, Optical Character Recognition (OCR), Vehicle Identification

1.INTRODUCTION *(Size 11, Times New roman)*

Traditional vehicle identification methods are manual, time-consuming, and prone to errors. Automatic Number Plate Recognition (ANPR) uses computer vision and OCR to detect and read license plates in real time. This system enables fast, accurate, and automated vehicle identification for enhanced traffic and security management.

2. Body of Paper

In traditional vehicle monitoring systems, identification and verification are manual, time-consuming, and prone to errors. These methods struggle with scalability and are vulnerable to human oversight, making them inefficient for real-time traffic enforcement and security. Illegible plates, varying lighting conditions, and diverse plate formats further reduce reliability. As a result, conventional systems fail to provide the speed and accuracy needed for modern surveillance and automated access control.

Our project introduces an Automatic Number Plate Recognition (ANPR) system that automates vehicle identification using computer vision techniques. It captures images or video frames, detects license plates, segments characters, and extracts alphanumeric data using Optical Character Recognition (OCR). By integrating machine learning and real-time processing, the system delivers fast, accurate, and reliable results, making it ideal for traffic management and law enforcement.
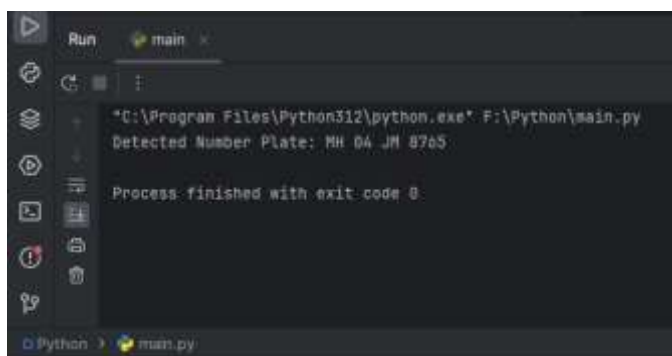
Fig -1: Contour and Edge detection

Furthermore, our ANPR system enhances performance and scalability by integrating cloud storage for secure archiving of recognized license plate data. Only authorized users can access the data, ensuring privacy and control. This combination of real-time computer vision, OCR, and decentralized storage offers a transparent, secure, and efficient solution for automated vehicle identification, traffic management, and law enforcement.

Fig -2: Thresholding for OCR

Fig -3: Text Recognition Output

3. CONCLUSIONS

Our project enhances vehicle identification and security by using Automatic Number Plate Recognition (ANPR). License plates are detected and recognized using computer vision and Optical Character Recognition (OCR) technology. The system processes images in real time, ensuring fast and accurate vehicle identification. By integrating machine learning, the system adapts to different conditions, making it more reliable, scalable, and resistant to errors, ideal for traffic management and law enforcement.

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