

Machine Learning and Applications

UE21EC352B

Number Plate Detection

Project Report

Team 14

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Introduction:

Number plate detection is an important problem in many applications, including traffic management, law enforcement, and vehicle monitoring. To function properly, these systems must precisely detect number plates from pictures or video frames. In this project, we are entirely focused on creating a reliable number plate detection system utilizing machine learning techniques.

Objective:

The goal of this project is to create and build a machine learning model that detects number plates in pictures or video streams. The system's goal is to precisely locate the position of number plates within the supplied data. The model's great accuracy and efficiency allow it to be used in real-world applications that require automatic number plate detection.

Methodology:

- 1) Dataset Acquisition: Obtain a broad dataset of photos of automobiles with visible license plates.
- 2) Data Preprocessing: Resize, normalize, and augment photos to prepare them for model training.
- 3) Model Selection: Select a machine learning or deep learning method appropriate for object identification tasks, such as Single Shot MultiBox Detector (SSD) or You Only Look Once (YOLO).
- 4) Training: Divide the data into training and validation sets. To learn the task of detecting number plates, train the selected model using annotated photos.
- 5) Evaluation: Evaluate the trained model's performance on a separate test dataset using measures such as accuracy, recall, and intersection over union (IoU).
- 6) Deployment: Combine the trained model with a practical system capable of real-time number plate detection.

Results:

The trained algorithm detected number plates with great accuracy across a wide range of scenarios and settings. The model's performance was measured using conventional criteria, confirming its ability to localize number plates inside pictures or video frames. The device also demonstrated real-time processing capabilities, making it ideal for use in applications needing automatic number plate detection.

Conclusion:

Finally, we created a comprehensive number plate identification system utilizing machine learning techniques. This study demonstrates the significance of dataset preparation, model selection, and evaluation in developing effective computer vision applications for specialized tasks such as number plate detection. Future work could include further refining the model for speed and scalability, as well as investigating new features to expand the system's potential. Overall, this effort advances the field of automatic number plate detection and has applications in a variety of businesses that rely on effective vehicle monitoring and management.

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