

A Review on Real-Time License Plate, Vehicle Type and Face Recognition Using Computer Vision

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Abstract. Automatic License Plate Recognition (ALPR) is an image processing system that uses various phases such as detection, pre-processing, segmentation, and recognition to identify vehicles based on their license plates. Vehicle Type Classification (VTC) is critical in transportation management systems, especially when operating in real-time environments. It's still difficult to classify and count each sort of vehicle. Face recognition is the most reliable biometric identification method and the most cutting-edge technology for security and password systems since it can detect the person with no interaction. This study aims to seek into the approaches and methods utilized in ALPR, VTC, and Face Recognition systems, with a particular focus on Deep Learning techniques. For the systems listed above, we conducted a thorough literature review and created tables with summaries of their methodology, datasets, recognition rates, and device configurations. We also examine and discuss relevant studies in order to determine the best technology for implementing these systems with more accuracy and efficiency. RCNN, Fast RCNN, Faster RCNN, SSD, and YOLO are some of the most common CNN models for recognizing vehicles and license plates. PCA, LBPH, and LDA algorithms appear to be the most well-known and successful convolutional neural network methods for face recognition. Many modern systems appear to be a hybrid or a combination of the above-mentioned algorithms, as some algorithms perform better especially when combined than when used alone. One of the more successful strategies looks to be PCA with LDA. Each of the proposed ALPR, VTC, and Face Recognition solutions has its own share of benefits and drawbacks.

Keywords: *ALPR, VTC, Face Recognition, LP, Deep Learning, Computer Vision*