

SMART VEHICLE IDENTIFICATION SYSTEM



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PREFACE

This textbook aims to provide a comprehensive and accessible introduction to Automatic vehicle identification, which is an essential stage in intelligent traffic systems.

Nowadays vehicles play a very big role in transportation. Also, the use of vehicles has been increasing because of population growth and human needs in recent years. Therefore, controlling and providing security to vehicles is becoming a big problem and much more difficult to solve. Automatic vehicle identification systems are used for the purpose of effective control and security maintenance.

CHAPTER-1 deals with an Intelligent parking system where each vehicle is identified automatically and security is provided to it using RFID-based technology. This system is useful for very big corporate offices, industries, etc., where hundreds of vehicles will move in and out. RFID is attached to their ID cards. Whenever a vehicle reaches the main entrance the RFID receiver across the gate will receive the ID of the vehicle and checks the ID for validation. If it is valid then it will send Gate open signal to the main entrance. In the case of visitors, the security enters the details and provides an RFID card to each visitor, and the guard is given the authority of opening and close the gate manually. As soon as the vehicle is parked the owner switches on the security system. In case of any movement in a particular slot, the alarm gives the siren and the guard will be intimated. In order to take his vehicle from the parking slot the owner has to disable the security system by swiping the card. Where as visitors deposit the cards back to the security guard.

CHAPTER-2 deals with the identification of Traffic density using Deep Learning Nowadays, Congestion in traffic is a serious problem. Mega cities are the ones most affected by it. Knowing the traffic density in real time helps in better signal control and effective traffic management. There can be different causes of congestion in traffic like insufficient capacity, unrestrained demand, large Red Light delays etc. Traffic lights are hard coded and dependent on traffic. Traffic density detection model is to build a system which calculates the density of the traffic through traffic video. This model assumes that there is front facing camera on traffic poles near the signals which will capture images/video. In this paper, we proposed a model; machine learning technology is of great help. OpenCV module is a highly optimized library with focus on real-time applications which can be used for the video analysis and visualization. OpenCV's helps the detection using 2D and 3D feature toolkits, Egomotion estimation, Vehicle recognition system, Human computer interaction (HCI), Motion understanding. There are three modules Object Detection, which detects the vehicle

from the image/video and Vehicles Count and Density, which is used to detect a valid vehicle and count the vehicles and also the total density of traffic and Signal Timing, which calculates the signal timing for each lane in a junction.

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