Chapter 11
A Novel Algorithm for Reducing the Vehicle Density in Traffic Scenario by Using YOLOv7 Algorithm

V. G. Janani Govindarajan
https://orcid.org/0009-0009-9583-3809
Velammal College of Engineering and Technology, India

S. Vasuki
Velammal College of Engineering and Technology, India

B. Muneeswari
Velammal College of Engineering and Technology, India

ABSTRACT

Large megalopolises are experiencing problems with corporate administration due to their expanding populations. The metro political road network regulation also has to be continuously observed, expanded, and modernized. We provide a sophisticated car tracking system with tape recording for surveillance. The suggested system combines neural networks and image-based dogging. To track automobiles, use the You Only Look Once (YOLOv7) method. We used several datasets to train the suggested algorithm. By adopting a Mobile Nets configuration, the YOLOv7's skeleton is altered. Also, its anchor boxes are changed so that they may be trained to recognize vehicle items. In meantime, further post-processing techniques are used to confirm the bounding box that has been found. It was confirmed after extensive

DOI: 10.4018/979-8-3693-6996-8.ch011

testing and analysis that using the suggested technique in a vehicle spotting system is a promising idea. YOLOv7 and the CNN algorithm for bounding box and class prediction. It is explained that the suggested system can locate, track, and count the cars accurately in a variety of situations.

1. INTRODUCTION:

Knowledge discovery in data (KDD) is a method that combines approaches from statistics, machine learning, and databank systems to identify the patterns in enormous datasets. The aim of KDD is to filter the information from a databank and transform it into a structure which it can be used by other applications. KDD often known as "Data mining," is the analysis phase of the process. Finding new information in a bulk of data bank is the aim of KDD. It is hoped that data mining would yield fresh and practical knowledge. One activity in object finding that is frequently employed in daily life is vehicle discovery. An essential component of intelligent transportation systems, (Harini *et al.,* 2023) similar to online labeling systems, free motor vehicles, and commerce monitoring, is vehicle locating. As a result, the need for vehicle-detecting systems is growing. Using the YOLOv7 setup, a vehicle spotting model will be put together in this effort. The anchor boxes that are employed are designed specifically for detecting vehicles to improve spotting accuracy. Mobile networks, which were much inferior to the original YOLOv7 backbone, i.e., Dark Net-53, are also employed as a new backbone, (Shi *et al.,* 2017). Further post-processing is also used to strengthen the bounding box that the YOLOv7 model created. Figure 1 represents the block diagram architecture of YOLOV7.

Figure 1. Block diagram architecture of YOLOV7