LAB: Parking Management System

Vehicle counting using a CNN based object detection model

I. Introduction

In this lab, you are required to create a simple program that (1) counts the number of vehicles in the parking lot and (2) display the number of available parking space.

For the given dataset, the maximum available parking space is 13. If the current number of vehicles is more than 13, then, the available space should display as ‘0’.

II. Procedure

You are required to program the system in Python and use only the Python-based object detection models.

- You can use any pretrained object detection model, such as YOLO v3, YOLO v4~5 etc.
- You can also train the model using custom/other open datasets
- You can clone a github repository of the object detection model, as long as you cite it in the reference.
- You do not need to create or modify the object detection model. You can use only the detected boundary box/classification results
- You can refer to any online material for assistance, as long as you do not copy it.

Download the test Video file

Mission

- Need to count the number of vehicles in the parking lot for each frame
- You also need to count the vehicles outside the parking lanes
- Make sure you do not count duplicates of the same vehicle
- It should accurately display the current number of vehicle and availabile parking spaces
- Record number of vehicles/frame in a text file (csv)
- Your program will be scored depending on the accuracy

III. Report and Demo Video

You are required to write a consice lab report and submit the program files and the demo video.

Lab Report:

- Show what you have done with concise explanations and example results of each necessary process
- The report should be within 4 pages using the given template (without appendix). But there will be no penalty for over-page report.
- If you have not used YOLO v3, then you need to explain briefly about the applied object detection model.
- In the appendix, show your source code.
- Submit in both PDF and original file (*.docx etc)
- No need to print out. Only the On-Line submission.

Demo Video:

- Create a demo video
- Submit in Hisnet or TA's email

Source Code:

- Zip all the necessary source files.
- Only the source code files. Do not submit image files, project files etc.