PIPELINE OF MODELS

We trained three models including Yolo v3, Yolo v4, and Faster RCNN model on WAYMO open dataset, which is almost 2TB after compression. Segments have been packaged into multiple files of 25GB or less, and each training dataset file includes 24 segmentations, where contain the data of LiDAR and five-front-and-side-facing videos However, training model took too much effort and time, so we downsized the resolution of images from 1920*1280 to 480*320. Moreover, all of model were trained by five cameras simultaneously.

1. In the beginning, we run Yolo v3 on one of segmentation in training dataset(training_0001.rar), but it came out an unsatisfied result.
2. (Increase data volume and diversity) Then, we retrained model on all of segmentations and training data files (training_0001.rar, training_0002.rar, and training_0003.rar). It turns out Yolo v3 performed better than last one.
3. (Increase training epochs) After training Yolo v3, we also trained Yolo v4 and Faster RCNN on the same standard. That is, we trained models on segmentations, which is sampling in training data, of three training dataset (training_0001.rar, training_0002.rar, and training_0003.rar). Besides, we trained model more epoch i.e. 100 epochs.
4. Also, we tried to display our models with the scene we are familiar. Therefore, we captured several night/daytime and in-campus/traffic roads videos around the university.

DATA EXPLAINATION

After decompressed the dataset, we stored the ground truth data in text file. Each record represents an image (Fig.1). For example, the record might look like: ‘D:\waymo\10017090\0-0.jpg 6.2, 7.6,6.8,7.5,1 9.7,8.8,8.4,4.8,1’. The first element is directory of image, and the second element represents a bounding-box such as ‘6.2, 7.6,6.8,7.5,1’ in a { [left_top_x, left_top_y], [right_bottom_x, right_bottom_y], classification_type} format. The digital from 1 to 5 are unknown, vehicle, pedestrian, sign, and cyclist type. Moreover, the training dataset contains 29,728 vehicles, 10,546 pedestrians, 266 cyclists, and 0 signs (Fig.2).

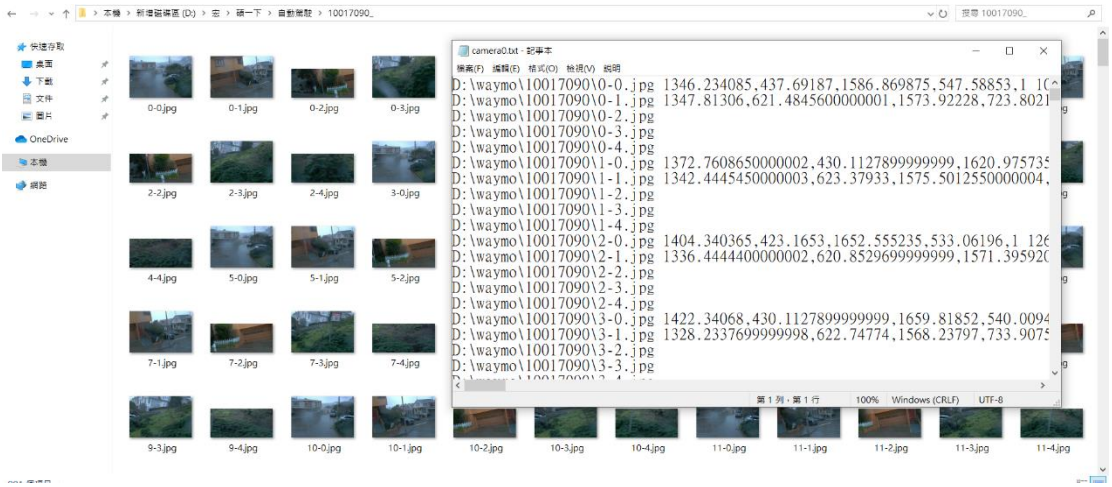

Figure1

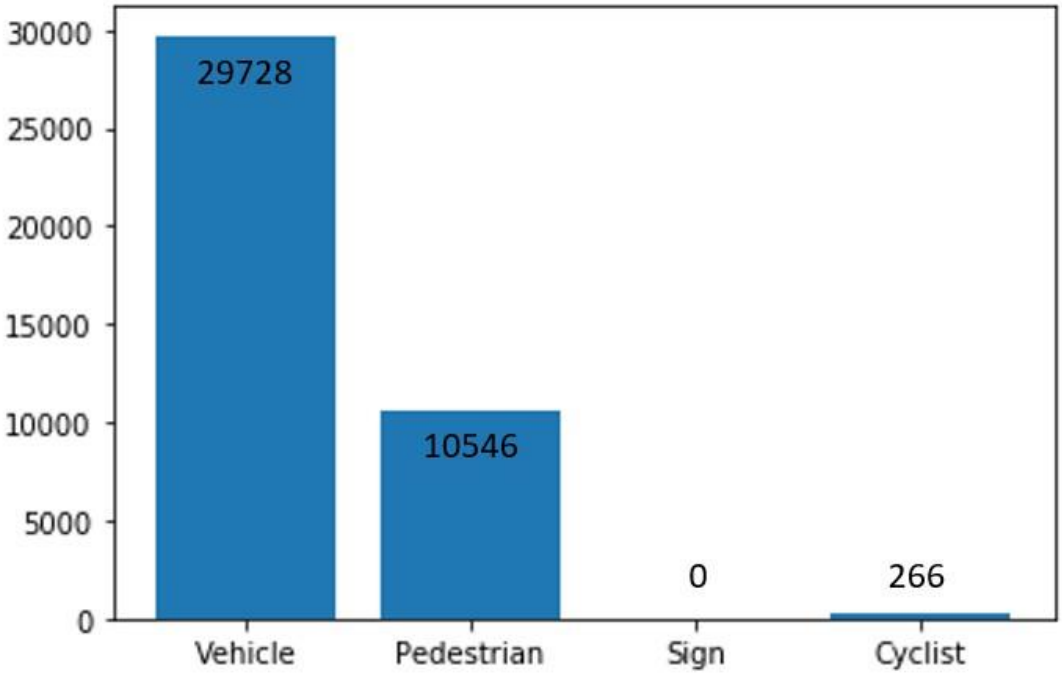

Figure2