MARMARA UNIVERSITY

FACULTY OF ENGINEERING

CSE4288

Introduction to Machine Learning

TERM PROJECT

Model Development Progress

Group: 2

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1. Modelling Work Completed

In our development so far within the project, we have trained a YOLOv8 object detection model for pedestrian crossing detection using a pre-trained dataset. The training script used yolov8s.pt pre-calculated weights with the following parameters 10 epochs, 640 image size and 16 chunk size. These settings provide an initial baseline evaluation of the model's performance. In the next steps of the project, the epochs value and image size for model evaluation will be increased and the learning rate will be added to improve the performance obtained in the first results.

2. Challenges Encountered and Solutions

- **Training Duration**: Training took about 4 hours for 10 epochs, largely due to the complexity of the model and large image sizes. While this limits the speed of experimentation, a solution to this cannot be presented as this time should be used for training by increasing the values in order to evaluate the model.
- **Memory Constraints:** High memory usage limits the ability to scale parameters such as chunk size. While this cannot be solved with the current hardware, adjustments such as reducing the image size can be attempted to partially reduce the problem.
- **Detection Accuracy:** Low confidence in crosswalk detection and fragmented bounding boxes highlight the need for improvement. Future plans include increasing the number of epochs, using larger image sizes, and adding a learning rate parameter to improve optimization.

3. References

[1] Fisher Yu. 2024. “BDD100K Documentation”. Date Accessed: 25.11.2024. (https://doc.bdd100k.com/index.html)

[2] Ultralytics, 2024. “Ultralytics YOLO Documentation”. Date Accessed: 25.11.2024. (https://docs.ultralytics.com/tr)