**Overview**

Autonomous vehicle equipped with an environment sensing system reduces the reliance on human control. Two models were trained with the images collected in the building of the University of Tennessee by the robot car. The accuracy of the model with TensorRT was higher than that with ImageAI. Thus, TensorRT was the chosen library working with the framework.

**Objective**

The objective of this project is the sign recognition. The classification was the function utilized to achieve self-driving. The car following and edge networking would be the long-term objectives performing in the future.

**ResNet18**

ResNet18 is the default model in the classification. It was pre-trained on the ImageNet dataset with 18 layers including 1 max pool layer, 16 convolution layers and 1 average pool layer. It prevents vanishing gradients owing to the shortcuts.

**Result**

The accuracy of the model using ResNet18 network with TensorRT was higher. The model trained with ImageAI would give wrong predictions. As for TensorRT, the probability could be higher than 90%. It was more reliable.

**Data**

The images were captured in the College of Education in 2019. 16540 photos were classified into 6 classes which were “W”, “L”, “R”, “TL”, “TR” and “RE”.

**Conclusion**

After comparing the accuracy of two models, the selected library was TensorRT. We will use it for classification in car-following as well. Hence, edge networking will be studied in order to achieve sharing information between vehicles.

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**Reference**