**Homework 3 report (CS2770 Computer Vision)**

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**Part I: Model trained by PASCAL dataset**

The first model is trained by the PASCAL dataset and the model is trained under different learning rate with 10 epochs. The training loss and mAP along with epochs are plotted below. During the training process, the total loss on training set keeps decreasing while the mean Average Precision (mAP) increases. It can be found that the model trained with the smallest learning rate, 0.001 has the best performance on validation dataset. The best model is the one saved at the 6th epoch. The mAP of selected model on validation dataset is 0.327. The reason for this low mAP value is the size of training dataset is pretty small.

1. Training loss on training set
2. Mean average precision on validation dataset

Figure 1. Model performance under different learning rate

**Part II: Model trained by PennFudanPed dataset**

The second model is trained by the PennFudanPedestrian dataset and the model is trained under different learning rate with 10 epochs. The training loss and mAP along with epochs are plotted below. During the training process, the total loss on training set keeps decreasing while the mean Average Precision (mAP) increases. It can be found that the model trained with the largest learning rate, 0.01 has the best performance on validation dataset. The best model is the one saved at the 7th epoch. The mAP of selected model on validation dataset is 0.866. Compared with the first model, this model has a much higher mAP value on validation dataset. The reason is that there is only one label: person to detect in this model.

1. Training loss on training set
2. Mean average precision on validation dataset

Figure 2. Model performance under different learning rate