VRDL - HW1 Report

Model and inference.py link: https://drive.google.com/drive/folders/1hNcn6LQO6Y-qYI_UF2ROibPQolEqyh4x?usp=sharing

1 GitHub link: https://github.com/andychan8877/VRDL_HW1/blob/main/HW1.py

2 Reference:

2.1 https://www.cnblogs.com/denny402/p/7512516.html

2.2 https://pytorch-tutorial.readthedocs.io/en/latest/tutorial/chapter04_advanced/4_1_fine-tuning/

2.3 https://www.itread01.com/question/aXgwZQ==.html

2.4 https://ensemble-pytorch.readthedocs.io/en/latest/

3 Introduction:

3.1 Package: I use Pytorch to do this homework.

3.2 Model: I use pretrained-model resnext50, and did some attemp about model ensemble by VotingClassifier.

4 Methodology:

4.1 Data pre-process: I use data augmentation package ‘transforms’ to generate more data, and change images to tensor and normalize with mean and standard deviation of pretrained model on ImageNet.

4.2 Model architecture: At first I chose resnet50, but I couldn’t train well, then I switched to resnext50. Later, I tried to use the model ensemble technique, VotingClassifier, but I still couldn’t get good results.

4.3 Hyperparameters: I chose batch size as 50, learning rate as 0.001, p as 1 of random horizontal flip and random vertical flip, angle as 30 of random rotation, brightness=(0, 5), contrast=(0, 5), saturation=(0, 5), hue=(-0.1, 0.1) of ColorJitter, and crop size of 200.

5 Summary:

In the process of doing this homework, since it was the first time to use pytorch for deep learning methods, I spent some time getting familiar with pytorch's dataset and dataloader mechanism, and then searched for a lot of data augmentation and pre-processing techniques. Then I used the pretrained model resnet50 mentioned by my assistant to train, but did not get good results.

Then I tried to use the model ensemble method, VotingClassifier. Although the training loss and validation loss seemed normal during the training process, the results of the submission were still not very good. So I switched to the pretrained model of resnext50, but in the end I still couldn't train successfully. I think that the method and choice of data augmentation are very important when

there is little information, but after constantly searching for information, it still cannot exceed the baseline.

In the end, I don't know what else can be done, even though the pretrained model is used for fine-tuning, the effect of transfer learning cannot be achieved. At the beginning, my highest score was 0.23, but the model was accidentally lost and I couldn’t reproduce it. The final score was 0.1599, which is also the model provided.

Although I could not successfully meet the baseline standards, I kept searching for many methods and examples on many websites during the course of this assignment, which should help a lot in future implementation opportunities. I also hope that the teaching assistants will be able to do so after this assignment. Can you tell me more about the skills of how to complete the homework smoothly, etc. Thank you, teaching assistant.