Q3 Short Video Classification

To train a classifier from scartch for a video classification problem is very time consuming and also very computationally intensive. Therefore, I used a pretrained 3d Swin-Transformer and fine-tuned on our dataset with a 3-layer mlp protocol.

3d swin transformer efficiently extracts video features in both temporal and spatial dimensions and with a 3-layer linear protocol, we can use the features extracted by 3d swin transformer and deal with the classification problem.

Data Preprocessing

Thanks to the Github repo https://github.com/YuxinZhaozyx/pytorch-VideoDataset/tree/master, with the help of this great repository, I can easily process the video format data and convert them into Pytorch Tensor which allows the 3d swin-transformer to be trained. Also, I do some data augmentation to enhance the robustness of our model.

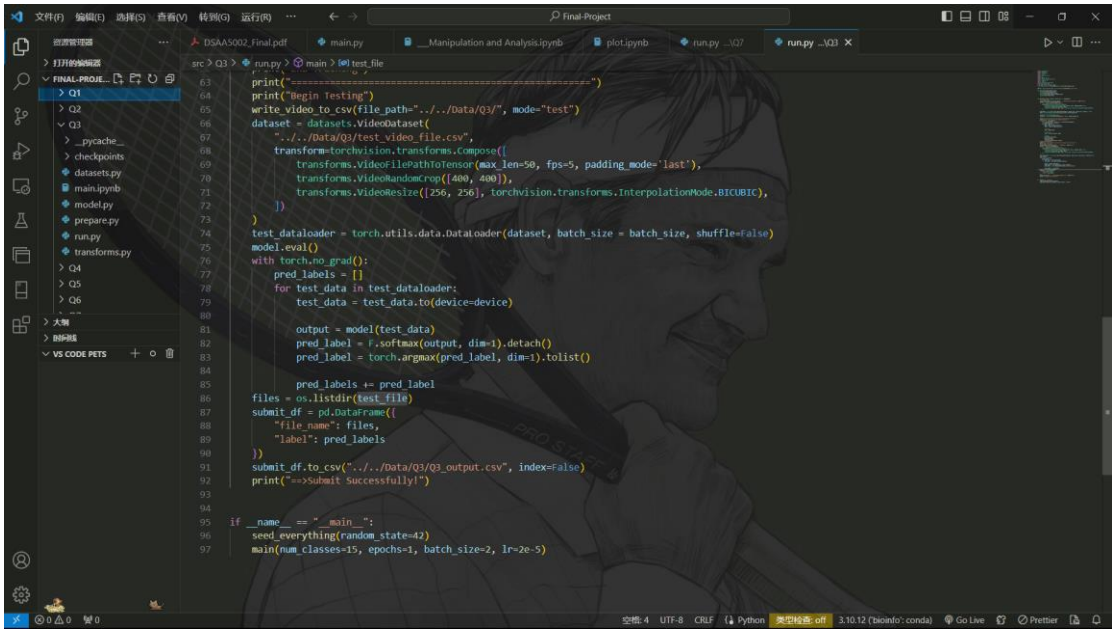
Fine-tuning

The 3d swin-transformer 3d can be regarded as a feature extractor, we use those features extracted by well pretrained model to perform on the downstream tasks. In this case, I design a 3-layer MLP to do the classification problem on our datasets.

After around 1 hour fine-tuning, I do the inference and get the predict labels on test dataset.

Experiment Screenshot

Here is the screenshot of this Q3 task, I done this task on the cloud platform with a piece of V100 GPU.



[1]:
```
from run import seed_everything, main
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[2]:
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seed_everything(random_state=42)
main(num_classes=15, epochs=1, batch_size=2, lr=2e-5, test_file="../../Data/Q3/test_video/")
```

```
============================================================
Begin Fine-tuning on Our weather dataset
Training:   5%|▌          | 51/1031 [02:21<56:06,  3.44s/it, Loss=2.82] [h264 @ 0x56244db3eb40] P sub_mb_type 4 out of range at 61 21
[h264 @ 0x56244db3eb40] error while decoding MB 61 21
[h264 @ 0x56244db3eb40] P sub_mb_type 4 out of range at 61 21
[h264 @ 0x56244db3eb40] error while decoding MB 61 21
[h264 @ 0x56244db3eb40] P sub_mb_type 4 out of range at 61 21
[h264 @ 0x56244db3eb40] error while decoding MB 61 21
[h264 @ 0x56244db3eb40] P sub_mb_type 4 out of range at 61 21
[h264 @ 0x56244db3eb40] error while decoding MB 61 21

End Training
============================================================
Begin Testing


==>Submit Successfully!
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