Project 2 Action Recognition on UCF101

In this project, we will implement classical action recognition method C3D on UCF101 video dataset. The UCF101 video dataset is an action recognition dataset of realistic action videos, collected from YouTube, having 101 categories. The following picture illustrates some action categories in the dataset.

Before you start this project, please read the ICCV 2015 paper (Learning Spatiotemporal Features with 3D Convolutional Networks). You need to answer Q1, Q2, Q3, Q4 and Q5 in a report.

Q1

Visit the UCF101 official website and download the video dataset (`https://www.crcv.ucf.edu/datasets/human-actions/ucf101/UCF101.rar`). Unzip the dataset in the "data" folder. Then read the dataset.py file in the "dataloaders" folder and answer how this code split videos into training, validation and testing dataset.

Q2

Read the dataset.py file and answer how this code prepare the video data and the label.

Q3

Read the paper and reproduce the C3D network in C3D_model.py in network folder.

You need to implement the init and the forward function of C3D class.

Q4

Read the train.py. Feel free to train the model if you have GPU resources (GPU memory: at least 2GB). If you do not have GPU resources, I have prepared a pretrained model (C3D-ucf101_epoch-19.pth.tar). If you need it please put it in the "run/run_0/model/" folder. Then explain the experiment details of train.py in your report. I spend about 1 hour on a RTX 3090 GPU with batch size=64. Please find the model files (c3d-init.pth and C3D-ucf101_epoch-19.pth.tar) on google drive and put c3d-init.pth in the "models" folder.(https://drive.google.com/drive/folders/0AIf6uQcTDj-LUk9PVA)

Q5

Test your model and provide one example of action recognition like demo1.gif in assets folder. I provide a test code, but it cannot generate the demo1.gif, add a function in your test code so that it can generate example of action recognition.

Please submit your C3D_model.py, test.py and report to mycourse. **Please do not submit your model file and dataset.**