Self-Supervised Representation Learning for Video Quality Assessment

Description

Code for the **Self-Supervised Representation Learning for Video Quality Assessment**. The code are mostly based on Swin-Transformer、 Vision Transformer and DVQA.

- S. Jiang, Q. Sang, Z. Hu and L. Liu, "Self-Supervised Representation Learning for Video Quality Assessment," *IEEE Transactions on Broadcasting*, 2022, doi: 10.1109/TBC.2022.3197904.

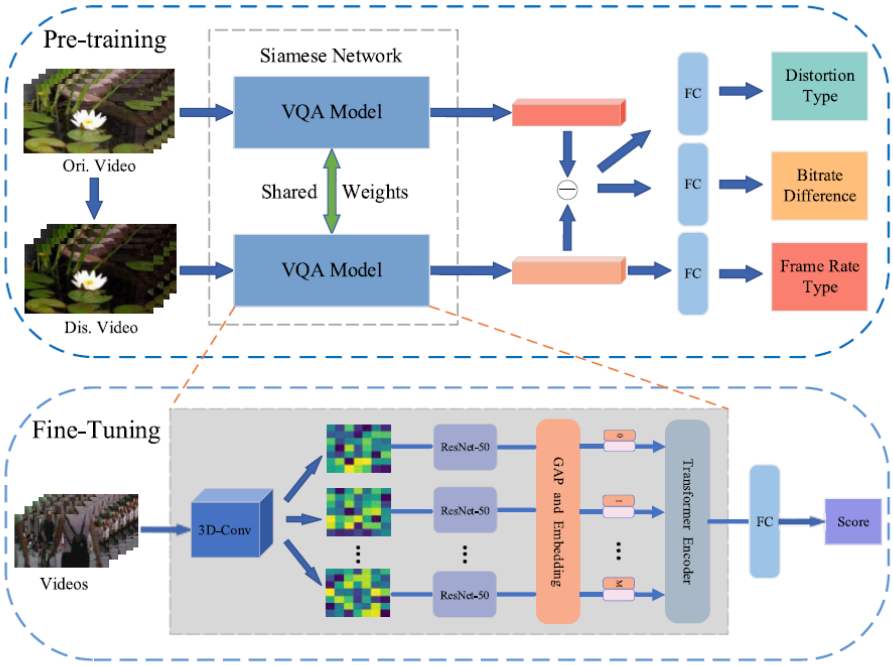

Fig. 1. Flow chart of the self-supervised representation learning for VQA. Top: pre-training by self-supervised pretext tasks; bottom: fine-tuning for the VQA model.

Requirement

Create Environment

```
conda create -n VQA python=3.8
conda activate VQA
```

Install Pytorch and Tensorboard

```
# pytorch: 1.8.2
# CUDA 11.1
# https://pytorch.org/get-started/locally/
```

```
conda install pytorch torchvision torchaudio cudatoolkit=11.1 -c pytorch-lts -c
nvidia
```

```
conda install tensorboard
```

Install the Requirements

```
# install the requirements:
pip install -r requirements.txt
```

- Pytorch 1.8.2
- CUDA 11.1
- Python 3.8

Self-supervised Database

We selected 310 videos of resolution 1280 × 720 pixels or larger from the YouTube-8M database.

We provided the 310 original vidoes and the code for generation distortion videos.

310 original videos

DownLoad Link

Password: rd0v

Distortion generate

`./pretrained_database/make_dis.py`: modify the settings to satisfy your environment.

Pre-train

```
python3 pre_trained.py --batch-size=6 --batch-test=2 --frame=16 --model=pre_train --
epoch=50 --base_lr=2e-4 --best=0.5
```

Fine-tuning

We provided the pre-trained weight on our self-supervised database for fine-tuning.

DownLoad Link

Password: lezn

Tips

- change the **video path** in `getVQA.py`. e. g. `'/home1/server823-2/database/2D-Video/CSIQVideo'`

- `train_vqa_type` used for LIVE and CSIQ Database.
- `train_vqa_yuv` used for KoNVid-1k and LIVE-VQC Database.
- if you meet this problem:

```
AttributeError: partially initialized module 'cv2' has no attribute
'_registerMatType' (most likely due to a circular import)
```

try this:

```
pip intsall opencv_python_headless==4.2.0.34
```

Run-srcipt

`TEST_*.sh`: train-test in *LIVE/CSIQ/KoNVid-1k/LIVE-VQC* Database. (**Both Fine-tuning and Baseline**)
`TRAIN_LIVE_TEST_OTHER.sh`: train on LIVE Database, test on other Databases.

Demo

run `python3 demo.py` to get the predict for one test video. (You can modify the setting by yourself.)

Contact me

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