Video Inpainting

Date Created	@December 5, 2022 9:51 AM
Status	Doing

Mask Generation

MiVOS

Need a tool to generate masks first.

Found MiVOS → https://github.com/hkchengrex/MiVOS

```
git clone https://github.com/hkchengrex/MiVOS.git
cd MiVOS

# Install dependencies
conda create -n mivos python=3.7
conda activate mivos
pip install numpy Cython
pip install PyQt5 davisinteractive progressbar2 opencv-python networkx gitpython gdown
conda install pytorch==1.7.1 torchvision==0.8.2 torchaudio==0.7.2 -c pytorch
pip install matplotlib

# Run
python download_model.py
python interactive_gui.py --images <path to a folder of images>
```

Have to download bunch of `pth` models as well.

Faced **conflict between PyQt5 and opencv-python.**

```
pip uninstall opencv-python
pip install opencv-python-headless
```

```
python interactive_gui.py --images <path to a folder of images>
python interactive_gui.py --video <path to video>
```

Memory issue faced.

```
RuntimeError: CUDA out of memory. Tried to allocate 80.00 MiB
(GPU 0; 5.80 GiB total capacity; 3.23 GiB already allocated;
56.31 MiB free; 3.39 GiB reserved in total by PyTorch)
```

Also do this if you have `export QT_QPA_PLATFORM=offscreen` in `zshrc` or `bashrc`. :

```
export QT_QPA_PLATFORM=xcb
```

Need to test it on the server with X11.

Using on the remote server with RDP. Got the mask results for a sample.

Also found a tool `imagemagick` to combine images in Linux.

```
convert img1.png img2.png +append joined_horizontal.png
convert img1.png img2.png -append joined_vertical.png

convert img1.png img2.png -resize x512 +append joined_horizontal.png
```

Image/Video Inpainting

Approach 1: FGVC

```
git clone https://github.com/vt-vl-lab/FGVC
cd FGVC
wget –quiet https://filebox.ece.vt.edu/~chengao/FGVC/demo.zip
unzip demo.zip
rm demo.zip
wget –quiet https://filebox.ece.vt.edu/~chengao/FGVC/weight.zip
unzip weight.zip
rm weight.zip
```

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

# If gpu supports cuda<11
conda install pytorch=1.6.0 torchvision=0.7.0 cudatoolkit=10.1 matplotlib scipy opencv -c pytorch
# else
conda install pytorch==1.7.1 torchvision==0.8.2 torchaudio==0.7.2 -c pytorch

pip install imageio imageio-ffmpeg scikit-image imutils opencv-python
```

```
chmod +x download_data_weights.sh
./download_data_weights.sh
```

Object removal

```
cd tool
python video_completion.py \
       --mode object_removal \
       --path ../data/tennis \
       --path_mask ../data/tennis_mask \
       --outroot ../result/tennis_removal \
       --seamless
```

Approach 2: FGT

```
git clone https://github.com/hitachinsk/FGT.git

conda create -n FGT python=3.6.8
conda activate FGT
pip install -r requirements.txt
pip install imageio-ffmpeg
```

If you need to run the codes on the local servers, here are the instructions.

1. Download the [pre-trained models], and the [data].
2. Put the downloaded zip files to the root directory of this project
3. Run `bash prepare_data.sh` to unzip the files
4. Run the object removal demo

```
cd tool
python video_inpainting.py --path ../data/frames/schoolgirls \
--path_mask ../data/masks/schoolgirls \
--outroot ../data/results/schoolgirls
```

Useful links

Papers with code

https://paperswithcode.com/sota/video-inpainting-on-youtube-vos

Video Inpainting

https://github.com/MCG-NKU/E2FGVI

https://github.com/hitachinsk/FGT

https://github.com/vt-vl-lab/FGVC

Image masks

https://github.com/hkchengrex/MiVOS

https://github.com/vt-vl-lab/FGVC

Tomorrow

Plan for tomorrow.

- Try FGVC → https://github.com/vt-vl-lab/FGVC
- Try FGT → https://github.com/hitachinsk/FGT
- Try E2FGVI → https://github.com/MCG-NKU/E2FGVI