```
# All the file names are tuned to google colab

import shutil
import os
shutil.rmtree("/content/sample_data")
shutil.rmtree("/content/.config")

! pip install adabelief-pytorch==0.2.0 pytorch_msssim onnxruntime
! git clone https://github.com/KGuzikowski/Deepfake.git .
! pip install -r requirements.txt
! git clone https://github.com/Media-Smart/vedadet
! git clone https://github.com/cleardusk/3DDFA_V2.git
% cd vedadet/
! vedadet_root=${PWD}
! pip install -r requirements/build.txt
! pip install --default-timeout=100 -v -e .
% cd /content/3DDFA_V2
! sh ./build.sh


from google.colab import drive
drive.mount('/content/drive')


!cp /content/tinaface_r50_fpn_gn_dcn.pth /content/vedadet/tinaface_r50_fpn_gn_dcn.p
!cp /content/my_configs.py /content/vedadet/my_configs.py
!cp /content/my_infer.py /content/vedadet/my_infer.py


import torch
if not torch.cuda.is_available():
    raise ImportError("Demo will not work without CUDA available!")

import sys
sys.path.append("/content/vedadet")
sys.path.append("/content/3DDFA_V2")

from pipeline import Preprocess
from arch import Model
from dataset import Dataset, ResumableRandomSampler, get_frames
from trainer import start_from_scratch, start_from_pretrained, load_training
from merger import merge_image, merge_video
```

Structure of our project

- pipeline.py - implementation of Preprocess class which does:
  - face detection (using vedadet)
  - face alignment (face landmarks are detected with 3DDFA_V2 model)

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```
# Fill your path to folders to store dst and src data
SRC_PATH, DST_PATH = "/content/drive/MyDrive/DeepFAKK/src", "/content/drive/MyDrive
```

```
# Fill your path to src and dst video
SRC_VID, DST_VID = "/content/drive/MyDrive/DeepFAKK/src_vid.mp4", "/content/drive/M
```

```
# 96 - quick96, 288 - SAEHD
RES = 144
```

```
src_dataset = get_frames(SRC_VID, SRC_PATH)
dst_dataset = get_frames(DST_VID, DST_PATH)
```

Training

Three methods of training:

- from scratch - entirely new model only based on swapping between src and dest
- from pretrained - take model that has already learned the latent space of face representation and make small adjustment with training for src/dest swapping
- load training - load the model that was in the middle of training process

Two model architectures proposed in paper:

- Quick96 - res=96, enc_ch=64, int_ch=128, dec_ch=64, dec_mask_ch=64
- SAEHD - res=288, enc_ch=92, int_ch=384, dec_ch=72, dec_mask_ch=22

```
# name your model
NAME = "model"
```

```
start_from_scratch(144, 64, 128, 64, 64, SRC_PATH, DST_PATH, NAME, aligned_subdir='
```

```
start_from_pretrained("/content/pretrained/model_96.pt", SRC_PATH, DST_PATH, NAME)
```

```
load_training("/content/pretrained/model.pt", SRC_PATH, DST_PATH, NAME, aligned_sub
```

```
    return model

m = load_model("/content/model.pt")


from PIL import Image
import matplotlib.pyplot as plt
import numpy as np

im = np.array(Image.open("/content/drive/MyDrive/dest/0.jpg")).astype(np.float32)/
out_im = merge_image(m, im)
plt.imshow(out_im)


INPUT_VIDEO = ""
OUTPUT_VIDEO = ""
merge_video(m, INPUT_VIDEO, OUTPUT_VIDEO)
```

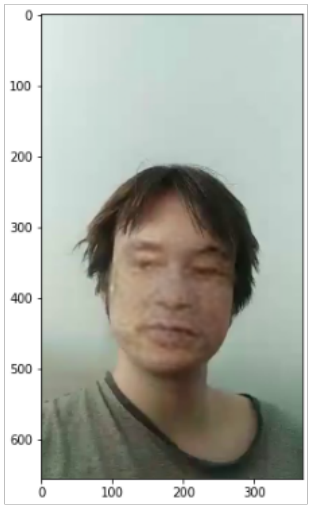
Results

```
from PIL import Image
import matplotlib.pyplot as plt
import numpy as np

images = [
          "/content/images/IMG_20210622_092630.jpg",
          "/content/images/indeks.jpg",
          "/content/images/jonah_hill.jpg",
          "/content/images/unknown.png",
          None,
          "/content/images/dest.jpg"
]

fig, axs = plt.subplots(2, 3, figsize=(17, 15))

for im_path, ax in zip(images, axs.flatten()):
```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