

realvsfakepart-grad

May 17, 2024

```
[ ]: !pip install gradio
```

Collecting gradio

Downloading gradio-4.31.0-py3-none-any.whl (12.3 MB)

12.3/12.3 MB

14.2 MB/s eta 0:00:00

Collecting aiofiles<24.0,>=22.0 (from gradio)

Downloading aiofiles-23.2.1-py3-none-any.whl (15 kB)

Requirement already satisfied: altair<6.0,>=4.2.0 in
/usr/local/lib/python3.10/dist-packages (from gradio) (4.2.2)

Collecting fastapi (from gradio)

Downloading fastapi-0.111.0-py3-none-any.whl (91 kB)

92.0/92.0 kB

5.3 MB/s eta 0:00:00

Collecting ffmpy (from gradio)

Downloading ffmpy-0.3.2.tar.gz (5.5 kB)

Preparing metadata (setup.py) ... done

Collecting gradio-client==0.16.2 (from gradio)

Downloading gradio_client-0.16.2-py3-none-any.whl (315 kB)

315.5/315.5

kB 21.2 MB/s eta 0:00:00

Collecting httpx>=0.24.1 (from gradio)

Downloading httpx-0.27.0-py3-none-any.whl (75 kB)

75.6/75.6 kB

4.9 MB/s eta 0:00:00

Requirement already satisfied: huggingface-hub>=0.19.3 in
/usr/local/lib/python3.10/dist-packages (from gradio) (0.20.3)

Requirement already satisfied: importlib-resources<7.0,>=1.3 in
/usr/local/lib/python3.10/dist-packages (from gradio) (6.4.0)

Requirement already satisfied: jinja2<4.0 in /usr/local/lib/python3.10/dist-
packages (from gradio) (3.1.4)

Requirement already satisfied: markupsafe~=2.0 in
/usr/local/lib/python3.10/dist-packages (from gradio) (2.1.5)

Requirement already satisfied: matplotlib~=3.0 in
/usr/local/lib/python3.10/dist-packages (from gradio) (3.7.1)

Requirement already satisfied: numpy~=1.0 in /usr/local/lib/python3.10/dist-
packages (from gradio) (1.25.2)

```

Collecting orjson~=3.0 (from gradio)
  Downloading
orjson-3.10.3-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (142
kB)
142.5/142.5
kB 955.1 kB/s eta 0:00:00
Requirement already satisfied: packaging in
/usr/local/lib/python3.10/dist-packages (from gradio) (24.0)
Requirement already satisfied: pandas<3.0,>=1.0 in
/usr/local/lib/python3.10/dist-packages (from gradio) (2.0.3)
Requirement already satisfied: pillow<11.0,>=8.0 in
/usr/local/lib/python3.10/dist-packages (from gradio) (9.4.0)
Requirement already satisfied: pydantic>=2.0 in /usr/local/lib/python3.10/dist-
packages (from gradio) (2.7.1)
Collecting pydub (from gradio)
  Downloading pydub-0.25.1-py2.py3-none-any.whl (32 kB)
Collecting python-multipart>=0.0.9 (from gradio)
  Downloading python_multipart-0.0.9-py3-none-any.whl (22 kB)
Requirement already satisfied: pyyaml<7.0,>=5.0 in
/usr/local/lib/python3.10/dist-packages (from gradio) (6.0.1)
Collecting ruff>=0.2.2 (from gradio)
  Downloading ruff-0.4.4-py3-none-manylinux_2_17_x86_64.manylinux2014_x86_64.whl
(8.7 MB)
8.7/8.7 MB
30.4 MB/s eta 0:00:00
Collecting semantic-version~=2.0 (from gradio)
  Downloading semantic_version-2.10.0-py2.py3-none-any.whl (15 kB)
Collecting tomlkit==0.12.0 (from gradio)
  Downloading tomlkit-0.12.0-py3-none-any.whl (37 kB)
Collecting typer<1.0,>=0.12 (from gradio)
  Downloading typer-0.12.3-py3-none-any.whl (47 kB)
47.2/47.2 kB
5.2 MB/s eta 0:00:00
Requirement already satisfied: typing-extensions~=4.0 in
/usr/local/lib/python3.10/dist-packages (from gradio) (4.11.0)
Requirement already satisfied: urllib3~=2.0 in /usr/local/lib/python3.10/dist-
packages (from gradio) (2.0.7)
Collecting uvicorn>=0.14.0 (from gradio)
  Downloading uvicorn-0.29.0-py3-none-any.whl (60 kB)
60.8/60.8 kB
6.7 MB/s eta 0:00:00
Requirement already satisfied: fsspec in /usr/local/lib/python3.10/dist-
packages (from gradio-client==0.16.2->gradio) (2023.6.0)
Collecting websockets<12.0,>=10.0 (from gradio-client==0.16.2->gradio)
  Downloading websockets-11.0.3-cp310-cp310-manylinux_2_5_x86_64.manylinux1_x86_
64.manylinux_2_17_x86_64.manylinux2014_x86_64.whl (129 kB)

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129.9/129.9

kB 15.2 MB/s eta 0:00:00

Requirement already satisfied: entrypoints in /usr/local/lib/python3.10/dist-packages (from altair<6.0,>=4.2.0->gradio) (0.4)

Requirement already satisfied: jsonschema>=3.0 in /usr/local/lib/python3.10/dist-packages (from altair<6.0,>=4.2.0->gradio) (4.19.2)

Requirement already satisfied: toolz in /usr/local/lib/python3.10/dist-packages (from altair<6.0,>=4.2.0->gradio) (0.12.1)

Requirement already satisfied: anyio in /usr/local/lib/python3.10/dist-packages (from httpx>=0.24.1->gradio) (3.7.1)

Requirement already satisfied: certifi in /usr/local/lib/python3.10/dist-packages (from httpx>=0.24.1->gradio) (2024.2.2)

Collecting httpcore==1.* (from httpx>=0.24.1->gradio)

Downloading httpcore-1.0.5-py3-none-any.whl (77 kB)

77.9/77.9 kB

4.1 MB/s eta 0:00:00

Requirement already satisfied: idna in /usr/local/lib/python3.10/dist-packages (from httpx>=0.24.1->gradio) (3.7)

Requirement already satisfied: sniffio in /usr/local/lib/python3.10/dist-packages (from httpx>=0.24.1->gradio) (1.3.1)

Collecting h11<0.15,>=0.13 (from httpcore==1.*->httpx>=0.24.1->gradio)

Downloading h11-0.14.0-py3-none-any.whl (58 kB)

58.3/58.3 kB

7.6 MB/s eta 0:00:00

Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.19.3->gradio) (3.14.0)

Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.19.3->gradio) (2.31.0)

Requirement already satisfied: tqdm>=4.42.1 in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.19.3->gradio) (4.66.4)

Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio) (1.2.1)

Requirement already satisfied: cycycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio) (0.12.1)

Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio) (4.51.0)

Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio) (1.4.5)

Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio) (3.1.2)

Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio) (2.8.2)

Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.10/dist-packages (from pandas<3.0,>=1.0->gradio) (2023.4)

Requirement already satisfied: tzdata>=2022.1 in /usr/local/lib/python3.10/dist-packages (from pandas<3.0,>=1.0->gradio) (2024.1)

Requirement already satisfied: annotated-types>=0.4.0 in /usr/local/lib/python3.10/dist-packages (from pydantic>=2.0->gradio) (0.6.0)

Requirement already satisfied: pydantic-core==2.18.2 in /usr/local/lib/python3.10/dist-packages (from pydantic>=2.0->gradio) (2.18.2)

Requirement already satisfied: click>=8.0.0 in /usr/local/lib/python3.10/dist-packages (from typer<1.0,>=0.12->gradio) (8.1.7)

Collecting shellingham>=1.3.0 (from typer<1.0,>=0.12->gradio)

Downloading shellingham-1.5.4-py2.py3-none-any.whl (9.8 kB)

Requirement already satisfied: rich>=10.11.0 in /usr/local/lib/python3.10/dist-packages (from typer<1.0,>=0.12->gradio) (13.7.1)

Collecting starlette<0.38.0,>=0.37.2 (from fastapi->gradio)

Downloading starlette-0.37.2-py3-none-any.whl (71 kB)

71.9/71.9 kB

6.4 MB/s eta 0:00:00

Collecting fastapi-cli>=0.0.2 (from fastapi->gradio)

Downloading fastapi_cli-0.0.3-py3-none-any.whl (9.2 kB)

Collecting ujson!=4.0.2,!4.1.0,!4.2.0,!4.3.0,!5.0.0,!5.1.0,>=4.0.1 (from fastapi->gradio)

Downloading ujson-5.9.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (53 kB)

53.2/53.2 kB

6.0 MB/s eta 0:00:00

Collecting email_validator>=2.0.0 (from fastapi->gradio)

Downloading email_validator-2.1.1-py3-none-any.whl (30 kB)

Collecting dnspython>=2.0.0 (from email_validator>=2.0.0->fastapi->gradio)

Downloading dnspython-2.6.1-py3-none-any.whl (307 kB)

307.7/307.7 kB

25.9 MB/s eta 0:00:00

Requirement already satisfied: attrs>=22.2.0 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=3.0->altair<6.0,>=4.2.0->gradio) (23.2.0)

Requirement already satisfied: jsonschema-specifications>=2023.03.6 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=3.0->altair<6.0,>=4.2.0->gradio) (2023.12.1)

Requirement already satisfied: referencing>=0.28.4 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=3.0->altair<6.0,>=4.2.0->gradio) (0.35.1)

Requirement already satisfied: rpds-py>=0.7.1 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=3.0->altair<6.0,>=4.2.0->gradio) (0.18.1)

Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib~3.0->gradio) (1.16.0)

Requirement already satisfied: markdown-it-py>=2.2.0 in /usr/local/lib/python3.10/dist-packages (from rich>=10.11.0->typer<1.0,>=0.12->gradio) (3.0.0)

Requirement already satisfied: pygments<3.0.0,>=2.13.0 in /usr/local/lib/python3.10/dist-packages (from rich>=10.11.0->typer<1.0,>=0.12->gradio) (2.16.1)

Requirement already satisfied: exceptiongroup in /usr/local/lib/python3.10/dist-packages (from anyio->httpx>=0.24.1->gradio) (1.2.1)

Collecting httptools>=0.5.0 (from uvicorn>=0.14.0->gradio)

Downloading httptools-0.6.1-cp310-cp310-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux_2_17_x86_64.manylinux2014_x86_64.whl (341 kB)

341.4/341.4

kB 29.1 MB/s eta 0:00:00

Collecting python-dotenv>=0.13 (from uvicorn>=0.14.0->gradio)

Downloading python_dotenv-1.0.1-py3-none-any.whl (19 kB)

Collecting uvloop!=0.15.0,!0.15.1,>=0.14.0 (from uvicorn>=0.14.0->gradio)

Downloading

uvloop-0.19.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (3.4 MB)

3.4/3.4 MB

39.1 MB/s eta 0:00:00

Collecting watchfiles>=0.13 (from uvicorn>=0.14.0->gradio)

Downloading

watchfiles-0.21.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (1.3 MB)

1.3/1.3 MB

31.9 MB/s eta 0:00:00

Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface-hub>=0.19.3->gradio) (3.3.2)

Requirement already satisfied: mdurl~=0.1 in /usr/local/lib/python3.10/dist-packages (from markdown-it-py>=2.2.0->rich>=10.11.0->typer<1.0,>=0.12->gradio) (0.1.2)

Building wheels for collected packages: ffmpeg

Building wheel for ffmpeg (setup.py) ... done

Created wheel for ffmpeg: filename=ffmpeg-0.3.2-py3-none-any.whl size=5584 sha256=29f81264f4c33a1fc456bdd51b276388dfc0659918ebd9e82e61a00360dd3d7d

Stored in directory: /root/.cache/pip/wheels/bd/65/9a/671fc6dcde07d4418df0c592f8df512b26d7a0029c2a23dd81

Successfully built ffmpeg

Installing collected packages: pydub, ffmpeg, websockets, uvloop, ujson, tomlkit, shellingham, semantic-version, ruff, python-multipart, python-dotenv, orjson, httptools, h11, dnspython, aiofiles, watchfiles, uvicorn, starlette, httpcore, email_validator, typer, httpx, gradio-client, fastapi-cli, fastapi, gradio

Attempting uninstall: typer

Found existing installation: typer 0.9.4

Uninstalling typer-0.9.4:

Successfully uninstalled typer-0.9.4

ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.

spacy 3.7.4 requires typer<0.10.0,>=0.3.0, but you have typer 0.12.3 which is incompatible.

weasel 0.3.4 requires typer<0.10.0,>=0.3.0, but you have typer 0.12.3 which is incompatible.

Successfully installed aiofiles-23.2.1 dnspython-2.6.1 email_validator-2.1.1 fastapi-0.111.0 fastapi-cli-0.0.3 ffmpeg-0.3.2 gradio-4.31.0 gradio-client-0.16.2 h11-0.14.0 httpcore-1.0.5 httptools-0.6.1 httpx-0.27.0 orjson-3.10.3 pydub-0.25.1 python-dotenv-1.0.1 python-multipart-0.0.9 ruff-0.4.4 semantic-version-2.10.0 shellingham-1.5.4 starlette-0.37.2 tomlkit-0.12.0 typer-0.12.3 ujson-5.9.0 uvicorn-0.29.0 uvloop-0.19.0 watchfiles-0.21.0 websockets-11.0.3

```
[ ]: !pip install facenet_pytorch
```

Collecting facenet_pytorch

Downloading facenet_pytorch-2.6.0-py3-none-any.whl (1.9 MB)

1.9/1.9 MB

9.3 MB/s eta 0:00:00

Requirement already satisfied: numpy<2.0.0,>=1.24.0 in

/usr/local/lib/python3.10/dist-packages (from facenet_pytorch) (1.25.2)

Collecting Pillow<10.3.0,>=10.2.0 (from facenet_pytorch)

Downloading pillow-10.2.0-cp310-cp310-manylinux_2_28_x86_64.whl (4.5 MB)

4.5/4.5 MB

17.1 MB/s eta 0:00:00

Requirement already satisfied: requests<3.0.0,>=2.0.0 in

/usr/local/lib/python3.10/dist-packages (from facenet_pytorch) (2.31.0)

Requirement already satisfied: torch<2.3.0,>=2.2.0 in

/usr/local/lib/python3.10/dist-packages (from facenet_pytorch) (2.2.1+cu121)

Requirement already satisfied: torchvision<0.18.0,>=0.17.0 in

/usr/local/lib/python3.10/dist-packages (from facenet_pytorch) (0.17.1+cu121)

Requirement already satisfied: tqdm<5.0.0,>=4.0.0 in

/usr/local/lib/python3.10/dist-packages (from facenet_pytorch) (4.66.4)

Requirement already satisfied: charset-normalizer<4,>=2 in

/usr/local/lib/python3.10/dist-packages (from

requests<3.0.0,>=2.0.0->facenet_pytorch) (3.3.2)

Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests<3.0.0,>=2.0.0->facenet_pytorch) (3.7)

Requirement already satisfied: urllib3<3,>=1.21.1 in

/usr/local/lib/python3.10/dist-packages (from

requests<3.0.0,>=2.0.0->facenet_pytorch) (2.0.7)

Requirement already satisfied: certifi>=2017.4.17 in

/usr/local/lib/python3.10/dist-packages (from

```

requests<3.0.0,>=2.0.0->facenet_pytorch) (2024.2.2)
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-
packages (from torch<2.3.0,>=2.2.0->facenet_pytorch) (3.14.0)
Requirement already satisfied: typing-extensions>=4.8.0 in
/usr/local/lib/python3.10/dist-packages (from
torch<2.3.0,>=2.2.0->facenet_pytorch) (4.11.0)
Requirement already satisfied: sympy in /usr/local/lib/python3.10/dist-packages
(from torch<2.3.0,>=2.2.0->facenet_pytorch) (1.12)
Requirement already satisfied: networkx in /usr/local/lib/python3.10/dist-
packages (from torch<2.3.0,>=2.2.0->facenet_pytorch) (3.3)
Requirement already satisfied: Jinja2 in /usr/local/lib/python3.10/dist-packages
(from torch<2.3.0,>=2.2.0->facenet_pytorch) (3.1.4)
Requirement already satisfied: fsspec in /usr/local/lib/python3.10/dist-packages
(from torch<2.3.0,>=2.2.0->facenet_pytorch) (2023.6.0)
Collecting nvidia-cuda-nvrtc-cu12==12.1.105 (from
torch<2.3.0,>=2.2.0->facenet_pytorch)
  Using cached nvidia_cuda_nvrtc_cu12-12.1.105-py3-none-manylinux1_x86_64.whl
(23.7 MB)
Collecting nvidia-cuda-runtime-cu12==12.1.105 (from
torch<2.3.0,>=2.2.0->facenet_pytorch)
  Using cached nvidia_cuda_runtime_cu12-12.1.105-py3-none-manylinux1_x86_64.whl
(823 kB)
Collecting nvidia-cuda-cupti-cu12==12.1.105 (from
torch<2.3.0,>=2.2.0->facenet_pytorch)
  Using cached nvidia_cuda_cupti_cu12-12.1.105-py3-none-manylinux1_x86_64.whl
(14.1 MB)
Collecting nvidia-cudnn-cu12==8.9.2.26 (from
torch<2.3.0,>=2.2.0->facenet_pytorch)
  Using cached nvidia_cudnn_cu12-8.9.2.26-py3-none-manylinux1_x86_64.whl (731.7
MB)
Collecting nvidia-cublas-cu12==12.1.3.1 (from
torch<2.3.0,>=2.2.0->facenet_pytorch)
  Using cached nvidia_cublas_cu12-12.1.3.1-py3-none-manylinux1_x86_64.whl (410.6
MB)
Collecting nvidia-cufft-cu12==11.0.2.54 (from
torch<2.3.0,>=2.2.0->facenet_pytorch)
  Using cached nvidia_cufft_cu12-11.0.2.54-py3-none-manylinux1_x86_64.whl (121.6
MB)
Collecting nvidia-curand-cu12==10.3.2.106 (from
torch<2.3.0,>=2.2.0->facenet_pytorch)
  Using cached nvidia_curand_cu12-10.3.2.106-py3-none-manylinux1_x86_64.whl
(56.5 MB)
Collecting nvidia-cusolver-cu12==11.4.5.107 (from
torch<2.3.0,>=2.2.0->facenet_pytorch)
  Using cached nvidia_cusolver_cu12-11.4.5.107-py3-none-manylinux1_x86_64.whl
(124.2 MB)
Collecting nvidia-cuspars-cu12==12.1.0.106 (from
torch<2.3.0,>=2.2.0->facenet_pytorch)

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Using cached nvidia_cuspars...
(196.0 MB)
Collecting nvidia-nccl-cu12==2.19.3 (from torch<2.3.0,>=2.2.0->facenet_pytorch)
Using cached nvidia_nccl_cu12-2.19.3-py3-none-manylinux1_x86_64.whl (166.0 MB)
Collecting nvidia-nvtx-cu12==12.1.105 (from
torch<2.3.0,>=2.2.0->facenet_pytorch)
Using cached nvidia_nvtx_cu12-12.1.105-py3-none-manylinux1_x86_64.whl (99 kB)
Requirement already satisfied: triton==2.2.0 in /usr/local/lib/python3.10/dist-
packages (from torch<2.3.0,>=2.2.0->facenet_pytorch) (2.2.0)
Collecting nvidia-nvjitlink-cu12 (from nvidia-cusolver-
cu12==11.4.5.107->torch<2.3.0,>=2.2.0->facenet_pytorch)
Using cached nvidia_nvjitlink_cu12-12.4.127-py3-none-manylinux2014_x86_64.whl
(21.1 MB)
Requirement already satisfied: MarkupSafe>=2.0 in
/usr/local/lib/python3.10/dist-packages (from
jinja2->torch<2.3.0,>=2.2.0->facenet_pytorch) (2.1.5)
Requirement already satisfied: mpmath>=0.19 in /usr/local/lib/python3.10/dist-
packages (from sympy->torch<2.3.0,>=2.2.0->facenet_pytorch) (1.3.0)
Installing collected packages: Pillow, nvidia-nvtx-cu12, nvidia-nvjitlink-cu12,
nvidia-nccl-cu12, nvidia-curand-cu12, nvidia-cufft-cu12, nvidia-cuda-runtime-
cu12, nvidia-cuda-nvrtc-cu12, nvidia-cuda-cupti-cu12, nvidia-cublas-cu12,
nvidia-cuspars...
Attempting uninstall: Pillow
Found existing installation: Pillow 9.4.0
Uninstalling Pillow-9.4.0:
Successfully uninstalled Pillow-9.4.0
ERROR: pip's dependency resolver does not currently take into account all
the packages that are installed. This behaviour is the source of the following
dependency conflicts.

imageio 2.31.6 requires pillow<10.1.0,>=8.3.2, but you have pillow 10.2.0 which
is incompatible.

Successfully installed Pillow-10.2.0 facenet_pytorch-2.6.0 nvidia-cublas-
cu12-12.1.3.1 nvidia-cuda-cupti-cu12-12.1.105 nvidia-cuda-nvrtc-cu12-12.1.105
nvidia-cuda-runtime-cu12-12.1.105 nvidia-cudnn-cu12-8.9.2.26 nvidia-cufft-
cu12-11.0.2.54 nvidia-curand-cu12-10.3.2.106 nvidia-cusolver-cu12-11.4.5.107
nvidia-cuspars...
nvidia-nccl-cu12-2.19.3 nvidia-nvjitlink-
cu12-12.4.127 nvidia-nvtx-cu12-12.1.105

```

```
[ ]: !pip install grad-cam
```

```

Collecting grad-cam
  Downloading grad-cam-1.5.0.tar.gz (7.8 MB)
                        7.8/7.8 MB
18.0 MB/s eta 0:00:00
Installing build dependencies ... done

```



```

Getting requirements to build wheel ... done
Preparing metadata (pyproject.toml) ... done
Requirement already satisfied: numpy in /usr/local/lib/python3.10/dist-packages
(from grad-cam) (1.25.2)
Requirement already satisfied: Pillow in /usr/local/lib/python3.10/dist-packages
(from grad-cam) (10.2.0)
Requirement already satisfied: torch>=1.7.1 in /usr/local/lib/python3.10/dist-
packages (from grad-cam) (2.2.1+cu121)
Requirement already satisfied: torchvision>=0.8.2 in
/usr/local/lib/python3.10/dist-packages (from grad-cam) (0.17.1+cu121)
Collecting ttach (from grad-cam)
  Downloading ttach-0.0.3-py3-none-any.whl (9.8 kB)
Requirement already satisfied: tqdm in /usr/local/lib/python3.10/dist-packages
(from grad-cam) (4.66.4)
Requirement already satisfied: opencv-python in /usr/local/lib/python3.10/dist-
packages (from grad-cam) (4.8.0.76)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.10/dist-
packages (from grad-cam) (3.7.1)
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.10/dist-
packages (from grad-cam) (1.2.2)
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-
packages (from torch>=1.7.1->grad-cam) (3.14.0)
Requirement already satisfied: typing-extensions>=4.8.0 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (4.11.0)
Requirement already satisfied: sympy in /usr/local/lib/python3.10/dist-packages
(from torch>=1.7.1->grad-cam) (1.12)
Requirement already satisfied: networkx in /usr/local/lib/python3.10/dist-
packages (from torch>=1.7.1->grad-cam) (3.3)
Requirement already satisfied: Jinja2 in /usr/local/lib/python3.10/dist-packages
(from torch>=1.7.1->grad-cam) (3.1.4)
Requirement already satisfied: fsspec in /usr/local/lib/python3.10/dist-packages
(from torch>=1.7.1->grad-cam) (2023.6.0)
Requirement already satisfied: nvidia-cuda-nvrtc-cu12==12.1.105 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (12.1.105)
Requirement already satisfied: nvidia-cuda-runtime-cu12==12.1.105 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (12.1.105)
Requirement already satisfied: nvidia-cuda-cupti-cu12==12.1.105 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (12.1.105)
Requirement already satisfied: nvidia-cudnn-cu12==8.9.2.26 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (8.9.2.26)
Requirement already satisfied: nvidia-cublas-cu12==12.1.3.1 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (12.1.3.1)
Requirement already satisfied: nvidia-cufft-cu12==11.0.2.54 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam)
(11.0.2.54)
Requirement already satisfied: nvidia-curand-cu12==10.3.2.106 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam)
(10.3.2.106)

```

Requirement already satisfied: nvidia-cusolver-cu12==11.4.5.107 in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (11.4.5.107)

Requirement already satisfied: nvidia-cuspars-cu12==12.1.0.106 in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (12.1.0.106)

Requirement already satisfied: nvidia-nccl-cu12==2.19.3 in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (2.19.3)

Requirement already satisfied: nvidia-nvtx-cu12==12.1.105 in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (12.1.105)

Requirement already satisfied: triton==2.2.0 in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.1->grad-cam) (2.2.0)

Requirement already satisfied: nvidia-nvjitlink-cu12 in /usr/local/lib/python3.10/dist-packages (from nvidia-cusolver-cu12==11.4.5.107->torch>=1.7.1->grad-cam) (12.4.127)

Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->grad-cam) (1.2.1)

Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib->grad-cam) (0.12.1)

Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib->grad-cam) (4.51.0)

Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->grad-cam) (1.4.5)

Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib->grad-cam) (24.0)

Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->grad-cam) (3.1.2)

Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib->grad-cam) (2.8.2)

Requirement already satisfied: scipy>=1.3.2 in /usr/local/lib/python3.10/dist-packages (from scikit-learn->grad-cam) (1.11.4)

Requirement already satisfied: joblib>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from scikit-learn->grad-cam) (1.4.2)

Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from scikit-learn->grad-cam) (3.5.0)

Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib->grad-cam) (1.16.0)

Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.10/dist-packages (from jinja2->torch>=1.7.1->grad-cam) (2.1.5)

Requirement already satisfied: mpmath>=0.19 in /usr/local/lib/python3.10/dist-packages (from sympy->torch>=1.7.1->grad-cam) (1.3.0)

Building wheels for collected packages: grad-cam

Building wheel for grad-cam (pyproject.toml) ... done

Created wheel for grad-cam: filename=grad_cam-1.5.0-py3-none-any.whl size=38071 sha256=bf3f422fb2f15e2d02e4d85a1d28e058bd0add3314eca6c9a2741054514b8178

Stored in directory: /root/.cache/pip/wheels/5b/e5/3d/8548241d5cffe53ad1476c56

```
6a61ad9bf09cc61a9430f09726
Successfully built grad-cam
Installing collected packages: ttach, grad-cam
Successfully installed grad-cam-1.5.0 ttach-0.0.3
```

```
[ ]: import gradio as gr
import torch
import torch.nn.functional as F
from facenet_pytorch import MTCNN, InceptionResnetV1
import numpy as np
from PIL import Image
import cv2
from pytorch_grad_cam import GradCAM
from pytorch_grad_cam.utils.model_targets import ClassifierOutputTarget
from pytorch_grad_cam.utils.image import show_cam_on_image
import warnings
warnings.filterwarnings("ignore")
```

```
[ ]: ## Download and load the model
```

```
[ ]: DEVICE = 'cuda:0' if torch.cuda.is_available() else 'cpu'

mtcnn = MTCNN(
    select_largest=False,
    post_process=False,
    device=DEVICE
).to(DEVICE).eval()
```

```
[ ]: model = InceptionResnetV1(
    pretrained="vggface2",
    classify=True,
    num_classes=1,
    device=DEVICE
)
```

```
[ ]: !pip install gdown

# Download the model from Google Drive
!gdown --id 1_WJ4f6i0SttNLHdGq8n06saoF4eJwGyt -O model.pt

# Load the model from the local file system
checkpoint = torch.load("model.pt", map_location=torch.device('cpu'))

# Load the state dictionary into the model
model.load_state_dict(checkpoint['model_state_dict'])
model.to(DEVICE)
model.eval()
```

Requirement already satisfied: gdown in /usr/local/lib/python3.10/dist-packages (5.1.0)

Requirement already satisfied: beautifulsoup4 in /usr/local/lib/python3.10/dist-packages (from gdown) (4.12.3)

Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from gdown) (3.14.0)

Requirement already satisfied: requests[socks] in /usr/local/lib/python3.10/dist-packages (from gdown) (2.31.0)

Requirement already satisfied: tqdm in /usr/local/lib/python3.10/dist-packages (from gdown) (4.66.4)

Requirement already satisfied: soupsieve>1.2 in /usr/local/lib/python3.10/dist-packages (from beautifulsoup4->gdown) (2.5)

Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests[socks]->gdown) (3.3.2)

Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests[socks]->gdown) (3.7)

Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests[socks]->gdown) (2.0.7)

Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests[socks]->gdown) (2024.2.2)

Requirement already satisfied: PySocks!=1.5.7,>=1.5.6 in /usr/local/lib/python3.10/dist-packages (from requests[socks]->gdown) (1.7.1)

/usr/local/lib/python3.10/dist-packages/gdown/__main__.py:132: FutureWarning: Option `--id` was deprecated in version 4.3.1 and will be removed in 5.0. You don't need to pass it anymore to use a file ID.

```
warnings.warn(
Downloading...
From (original):
https://drive.google.com/uc?id=1_WJ4f6i0SttNLHdGq8nO6saoF4eJwGyt
From (redirected): https://drive.google.com/uc?id=1_WJ4f6i0SttNLHdGq8nO6saoF4eJwGyt&confirm=t&uuid=c4520b19-29f3-4b71-94cb-e23fb2173f26
To: /content/model.pt
100% 282M/282M [00:11<00:00, 25.0MB/s]
```

```
[ ]: InceptionResnetV1(
    (conv2d_1a): BasicConv2d(
        (conv): Conv2d(3, 32, kernel_size=(3, 3), stride=(2, 2), bias=False)
        (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
    (conv2d_2a): BasicConv2d(
        (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), bias=False)
        (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
)
```

```

(conv2d_2b): BasicConv2d(
  (conv): Conv2d(32, 64, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1),
bias=False)
  (bn): BatchNorm2d(64, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
  (relu): ReLU()
)
(maxpool_3a): MaxPool2d(kernel_size=3, stride=2, padding=0, dilation=1,
ceil_mode=False)
(conv2d_3b): BasicConv2d(
  (conv): Conv2d(64, 80, kernel_size=(1, 1), stride=(1, 1), bias=False)
  (bn): BatchNorm2d(80, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
  (relu): ReLU()
)
(conv2d_4a): BasicConv2d(
  (conv): Conv2d(80, 192, kernel_size=(3, 3), stride=(1, 1), bias=False)
  (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
  (relu): ReLU()
)
(conv2d_4b): BasicConv2d(
  (conv): Conv2d(192, 256, kernel_size=(3, 3), stride=(2, 2), bias=False)
  (bn): BatchNorm2d(256, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
  (relu): ReLU()
)
(repeat_1): Sequential(
  (0): Block35(
    (branch0): BasicConv2d(
      (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
      (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (branch1): Sequential(
      (0): BasicConv2d(
        (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
        (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (1): BasicConv2d(
        (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
        (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)

```

```

        (relu): ReLU()
    )
)
(branch2): Sequential(
  (0): BasicConv2d(
    (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (1): BasicConv2d(
    (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (2): BasicConv2d(
    (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
)
(conv2d): Conv2d(96, 256, kernel_size=(1, 1), stride=(1, 1))
(relu): ReLU()
)
(1): Block35(
  (branch0): BasicConv2d(
    (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
      (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
      (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)

```

```

        (relu): ReLU()
    )
)
(branch2): Sequential(
  (0): BasicConv2d(
    (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (1): BasicConv2d(
    (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (2): BasicConv2d(
    (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
)
(conv2d): Conv2d(96, 256, kernel_size=(1, 1), stride=(1, 1))
(relu): ReLU()
)
(2): Block35(
  (branch0): BasicConv2d(
    (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
      (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
      (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)

```

```

        (relu): ReLU()
    )
)
(branch2): Sequential(
  (0): BasicConv2d(
    (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (1): BasicConv2d(
    (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (2): BasicConv2d(
    (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
)
(conv2d): Conv2d(96, 256, kernel_size=(1, 1), stride=(1, 1))
(relu): ReLU()
)
(3): Block35(
  (branch0): BasicConv2d(
    (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
      (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
      (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)

```



```

        (relu): ReLU()
    )
)
(branch2): Sequential(
  (0): BasicConv2d(
    (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (1): BasicConv2d(
    (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (2): BasicConv2d(
    (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
)
(conv2d): Conv2d(96, 256, kernel_size=(1, 1), stride=(1, 1))
(relu): ReLU()
)
(4): Block35(
  (branch0): BasicConv2d(
    (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
      (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
      (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)

```

```

        (relu): ReLU()
    )
)
(branch2): Sequential(
  (0): BasicConv2d(
    (conv): Conv2d(256, 32, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (1): BasicConv2d(
    (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (2): BasicConv2d(
    (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
    (bn): BatchNorm2d(32, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
)
(conv2d): Conv2d(96, 256, kernel_size=(1, 1), stride=(1, 1))
(relu): ReLU()
)
)
(mixed_6a): Mixed_6a(
  (branch0): BasicConv2d(
    (conv): Conv2d(256, 384, kernel_size=(3, 3), stride=(2, 2), bias=False)
    (bn): BatchNorm2d(384, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(256, 192, kernel_size=(1, 1), stride=(1, 1), bias=False)
      (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(192, 192, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
      (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,

```

```

track_running_stats=True)
    (relu): ReLU()
    )
    (2): BasicConv2d(
      (conv): Conv2d(192, 256, kernel_size=(3, 3), stride=(2, 2), bias=False)
      (bn): BatchNorm2d(256, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
  )
  (branch2): MaxPool2d(kernel_size=3, stride=2, padding=0, dilation=1,
ceil_mode=False)
)
(repeat_2): Sequential(
  (0): Block17(
    (branch0): BasicConv2d(
      (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1), bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (branch1): Sequential(
      (0): BasicConv2d(
        (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1),
bias=False)
        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (1): BasicConv2d(
        (conv): Conv2d(128, 128, kernel_size=(1, 7), stride=(1, 1),
padding=(0, 3), bias=False)
        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (2): BasicConv2d(
        (conv): Conv2d(128, 128, kernel_size=(7, 1), stride=(1, 1),
padding=(3, 0), bias=False)
        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
    )
  )
  (conv2d): Conv2d(256, 896, kernel_size=(1, 1), stride=(1, 1))
  (relu): ReLU()
)

```

```

(1): Block17(
  (branch0): BasicConv2d(
    (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1),
bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(128, 128, kernel_size=(1, 7), stride=(1, 1),
padding=(0, 3), bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (2): BasicConv2d(
      (conv): Conv2d(128, 128, kernel_size=(7, 1), stride=(1, 1),
padding=(3, 0), bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
  )
  (conv2d): Conv2d(256, 896, kernel_size=(1, 1), stride=(1, 1))
  (relu): ReLU()
)
(2): Block17(
  (branch0): BasicConv2d(
    (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1),
bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()

```

```

    )
    (1): BasicConv2d(
      (conv): Conv2d(128, 128, kernel_size=(1, 7), stride=(1, 1),
padding=(0, 3), bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (2): BasicConv2d(
      (conv): Conv2d(128, 128, kernel_size=(7, 1), stride=(1, 1),
padding=(3, 0), bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
  )
  (conv2d): Conv2d(256, 896, kernel_size=(1, 1), stride=(1, 1))
  (relu): ReLU()
)
(3): Block17(
  (branch0): BasicConv2d(
    (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1),
bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(128, 128, kernel_size=(1, 7), stride=(1, 1),
padding=(0, 3), bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (2): BasicConv2d(
      (conv): Conv2d(128, 128, kernel_size=(7, 1), stride=(1, 1),
padding=(3, 0), bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
  )
)

```

```

    )
    )
    (conv2d): Conv2d(256, 896, kernel_size=(1, 1), stride=(1, 1))
    (relu): ReLU()
    )
    (4): Block17(
      (branch0): BasicConv2d(
        (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1), bias=False)
        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (branch1): Sequential(
        (0): BasicConv2d(
          (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1),
bias=False)
          (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
          (relu): ReLU()
        )
        (1): BasicConv2d(
          (conv): Conv2d(128, 128, kernel_size=(1, 7), stride=(1, 1),
padding=(0, 3), bias=False)
          (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
          (relu): ReLU()
        )
        (2): BasicConv2d(
          (conv): Conv2d(128, 128, kernel_size=(7, 1), stride=(1, 1),
padding=(3, 0), bias=False)
          (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
          (relu): ReLU()
        )
      )
    )
    (conv2d): Conv2d(256, 896, kernel_size=(1, 1), stride=(1, 1))
    (relu): ReLU()
    )
    (5): Block17(
      (branch0): BasicConv2d(
        (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1), bias=False)
        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (branch1): Sequential(
        (0): BasicConv2d(

```

```

        (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1),
bias=False)
        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
    (1): BasicConv2d(
        (conv): Conv2d(128, 128, kernel_size=(1, 7), stride=(1, 1),
padding=(0, 3), bias=False)
        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
    (2): BasicConv2d(
        (conv): Conv2d(128, 128, kernel_size=(7, 1), stride=(1, 1),
padding=(3, 0), bias=False)
        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
    )
    (conv2d): Conv2d(256, 896, kernel_size=(1, 1), stride=(1, 1))
    (relu): ReLU()
)
(6): Block17(
  (branch0): BasicConv2d(
    (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1),
bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(128, 128, kernel_size=(1, 7), stride=(1, 1),
padding=(0, 3), bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (2): BasicConv2d(

```

```

        (conv): Conv2d(128, 128, kernel_size=(7, 1), stride=(1, 1),
padding=(3, 0), bias=False)
        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
)
(conv2d): Conv2d(256, 896, kernel_size=(1, 1), stride=(1, 1))
(relu): ReLU()
)
(7): Block17(
  (branch0): BasicConv2d(
    (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1),
bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(128, 128, kernel_size=(1, 7), stride=(1, 1),
padding=(0, 3), bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (2): BasicConv2d(
      (conv): Conv2d(128, 128, kernel_size=(7, 1), stride=(1, 1),
padding=(3, 0), bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
  )
  (conv2d): Conv2d(256, 896, kernel_size=(1, 1), stride=(1, 1))
  (relu): ReLU()
)
(8): Block17(
  (branch0): BasicConv2d(
    (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,

```



```

track_running_stats=True)
    (relu): ReLU()
)
(branch1): Sequential(
  (0): BasicConv2d(
    (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1),
bias=False)
    (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (1): BasicConv2d(
    (conv): Conv2d(128, 128, kernel_size=(1, 7), stride=(1, 1),
padding=(0, 3), bias=False)
    (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (2): BasicConv2d(
    (conv): Conv2d(128, 128, kernel_size=(7, 1), stride=(1, 1),
padding=(3, 0), bias=False)
    (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
)
(conv2d): Conv2d(256, 896, kernel_size=(1, 1), stride=(1, 1))
(relu): ReLU()
)
(9): Block17(
  (branch0): BasicConv2d(
    (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(896, 128, kernel_size=(1, 1), stride=(1, 1),
bias=False)
      (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(128, 128, kernel_size=(1, 7), stride=(1, 1),
padding=(0, 3), bias=False)

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```

        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
    (2): BasicConv2d(
        (conv): Conv2d(128, 128, kernel_size=(7, 1), stride=(1, 1),
padding=(3, 0), bias=False)
        (bn): BatchNorm2d(128, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
    )
    (conv2d): Conv2d(256, 896, kernel_size=(1, 1), stride=(1, 1))
    (relu): ReLU()
)
)
(mixed_7a): Mixed_7a(
    (branch0): Sequential(
        (0): BasicConv2d(
            (conv): Conv2d(896, 256, kernel_size=(1, 1), stride=(1, 1), bias=False)
            (bn): BatchNorm2d(256, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
            (relu): ReLU()
        )
        (1): BasicConv2d(
            (conv): Conv2d(256, 384, kernel_size=(3, 3), stride=(2, 2), bias=False)
            (bn): BatchNorm2d(384, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
            (relu): ReLU()
        )
    )
    (branch1): Sequential(
        (0): BasicConv2d(
            (conv): Conv2d(896, 256, kernel_size=(1, 1), stride=(1, 1), bias=False)
            (bn): BatchNorm2d(256, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
            (relu): ReLU()
        )
        (1): BasicConv2d(
            (conv): Conv2d(256, 256, kernel_size=(3, 3), stride=(2, 2), bias=False)
            (bn): BatchNorm2d(256, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
            (relu): ReLU()
        )
    )
    (branch2): Sequential(
        (0): BasicConv2d(

```

```

        (conv): Conv2d(896, 256, kernel_size=(1, 1), stride=(1, 1), bias=False)
        (bn): BatchNorm2d(256, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
    (1): BasicConv2d(
        (conv): Conv2d(256, 256, kernel_size=(3, 3), stride=(1, 1), padding=(1,
1), bias=False)
        (bn): BatchNorm2d(256, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
    (2): BasicConv2d(
        (conv): Conv2d(256, 256, kernel_size=(3, 3), stride=(2, 2), bias=False)
        (bn): BatchNorm2d(256, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
    )
)
(branch3): MaxPool2d(kernel_size=3, stride=2, padding=0, dilation=1,
ceil_mode=False)
)
(repeat_3): Sequential(
  (0): Block8(
    (branch0): BasicConv2d(
      (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1), bias=False)
      (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (branch1): Sequential(
      (0): BasicConv2d(
        (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1),
bias=False)
        (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (1): BasicConv2d(
        (conv): Conv2d(192, 192, kernel_size=(1, 3), stride=(1, 1),
padding=(0, 1), bias=False)
        (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (2): BasicConv2d(
        (conv): Conv2d(192, 192, kernel_size=(3, 1), stride=(1, 1),

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padding=(1, 0), bias=False)
    (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
    )
    )
    (conv2d): Conv2d(384, 1792, kernel_size=(1, 1), stride=(1, 1))
    (relu): ReLU()
    )
    (1): Block8(
        (branch0): BasicConv2d(
            (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1), bias=False)
            (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
            (relu): ReLU()
        )
        (branch1): Sequential(
            (0): BasicConv2d(
                (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1),
bias=False)
                (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
                (relu): ReLU()
            )
            (1): BasicConv2d(
                (conv): Conv2d(192, 192, kernel_size=(1, 3), stride=(1, 1),
padding=(0, 1), bias=False)
                (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
                (relu): ReLU()
            )
            (2): BasicConv2d(
                (conv): Conv2d(192, 192, kernel_size=(3, 1), stride=(1, 1),
padding=(1, 0), bias=False)
                (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
                (relu): ReLU()
            )
        )
    )
    (conv2d): Conv2d(384, 1792, kernel_size=(1, 1), stride=(1, 1))
    (relu): ReLU()
    )
    (2): Block8(
        (branch0): BasicConv2d(
            (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1), bias=False)
            (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)

```

```

        (relu): ReLU()
    )
    (branch1): Sequential(
      (0): BasicConv2d(
        (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1),
bias=False)
        (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (1): BasicConv2d(
        (conv): Conv2d(192, 192, kernel_size=(1, 3), stride=(1, 1),
padding=(0, 1), bias=False)
        (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (2): BasicConv2d(
        (conv): Conv2d(192, 192, kernel_size=(3, 1), stride=(1, 1),
padding=(1, 0), bias=False)
        (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
    )
    (conv2d): Conv2d(384, 1792, kernel_size=(1, 1), stride=(1, 1))
    (relu): ReLU()
  )
  (3): Block8(
    (branch0): BasicConv2d(
      (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1), bias=False)
      (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (branch1): Sequential(
      (0): BasicConv2d(
        (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1),
bias=False)
        (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (1): BasicConv2d(
        (conv): Conv2d(192, 192, kernel_size=(1, 3), stride=(1, 1),
padding=(0, 1), bias=False)
        (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,

```

```

track_running_stats=True)
    (relu): ReLU()
  )
  (2): BasicConv2d(
    (conv): Conv2d(192, 192, kernel_size=(3, 1), stride=(1, 1),
padding=(1, 0), bias=False)
    (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
)
(conv2d): Conv2d(384, 1792, kernel_size=(1, 1), stride=(1, 1))
(relu): ReLU()
)
(4): Block8(
  (branch0): BasicConv2d(
    (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (relu): ReLU()
  )
  (branch1): Sequential(
    (0): BasicConv2d(
      (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1),
bias=False)
      (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (1): BasicConv2d(
      (conv): Conv2d(192, 192, kernel_size=(1, 3), stride=(1, 1),
padding=(0, 1), bias=False)
      (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
    (2): BasicConv2d(
      (conv): Conv2d(192, 192, kernel_size=(3, 1), stride=(1, 1),
padding=(1, 0), bias=False)
      (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
      (relu): ReLU()
    )
  )
  (conv2d): Conv2d(384, 1792, kernel_size=(1, 1), stride=(1, 1))
  (relu): ReLU()
)

```

```

    )
    (block8): Block8(
      (branch0): BasicConv2d(
        (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1), bias=False)
        (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
        (relu): ReLU()
      )
      (branch1): Sequential(
        (0): BasicConv2d(
          (conv): Conv2d(1792, 192, kernel_size=(1, 1), stride=(1, 1), bias=False)
          (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
          (relu): ReLU()
        )
        (1): BasicConv2d(
          (conv): Conv2d(192, 192, kernel_size=(1, 3), stride=(1, 1), padding=(0,
1), bias=False)
          (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
          (relu): ReLU()
        )
        (2): BasicConv2d(
          (conv): Conv2d(192, 192, kernel_size=(3, 1), stride=(1, 1), padding=(1,
0), bias=False)
          (bn): BatchNorm2d(192, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
          (relu): ReLU()
        )
      )
      (conv2d): Conv2d(384, 1792, kernel_size=(1, 1), stride=(1, 1))
    )
    (avgpool_1a): AdaptiveAvgPool2d(output_size=1)
    (dropout): Dropout(p=0.6, inplace=False)
    (last_linear): Linear(in_features=1792, out_features=512, bias=False)
    (last_bn): BatchNorm1d(512, eps=0.001, momentum=0.1, affine=True,
track_running_stats=True)
    (logits): Linear(in_features=512, out_features=1, bias=True)
  )

```

```

[ ]: #model = InceptionResnetV1(
      # pretrained="vggface2",
      # classify=True,
      # num_classes=1,
      # device=DEVICE
      #)

```

```

checkpoint = torch.load("https://drive.google.com/uc?
↳export=download&id=1_WJ4f6i0SttNLHdGq8n06saoF4eJwGyt", map_location=torch.
↳device('cpu'))

#model.load_state_dict(checkpoint['model_state_dict'])
#model.to(DEVICE)
#model.eval()

```

```
[ ]: !export CUDA_VISIBLE_DEVICES=0
```

```

[ ]: def predict(input_image: Image.Image):
    """Predict the label of the input_image"""
    # Assuming you've already imported necessary libraries and defined DEVICE

    # Face detection and preprocessing
    face = mtcnn(input_image)
    if face is None:
        raise Exception('No face detected')
    face = face.unsqueeze(0) # Add the batch dimension
    face = F.interpolate(face, size=(256, 256), mode='bilinear',
↳align_corners=False)

    # Convert the face into a numpy array for visualization
    prev_face = face.squeeze(0).permute(1, 2, 0).cpu().detach().int().numpy()
    prev_face = prev_face.astype('uint8')

    # Device and data type conversion
    face = face.to(DEVICE)
    face = face.to(torch.float32)
    face = face / 255.0
    face_image_to_plot = face.squeeze(0).permute(1, 2, 0).cpu().detach().int().
↳numpy()

    # Grad-CAM visualization
    target_layers = [model.block8.branch1[-1]]
    use_cuda = torch.cuda.is_available()
    cam = GradCAM(model=model, target_layers=target_layers)
    targets = [ClassifierOutputTarget(0)]

    grayscale_cam = cam(input_tensor=face, targets=targets, eigen_smooth=True)
    grayscale_cam = grayscale_cam[0, :]
    visualization = show_cam_on_image(face_image_to_plot, grayscale_cam,
↳use_rgb=True)
    face_with_mask = cv2.addWeighted(prev_face, 1, visualization, 0.5, 0)

    # Classification and confidence scores
    with torch.no_grad():

```



```

output = torch.sigmoid(model(face).squeeze(0))
prediction = "real" if output.item() < 0.5 else "fake"
real_prediction = 1 - output.item()
fake_prediction = output.item()

confidences = {
    'real': real_prediction,
    'fake': fake_prediction
}
return confidences, face_with_mask

```

```

[ ]: from PIL import Image

# Load the input image
input_image_path = "/content/fake_frame_1.png"
input_image = Image.open(input_image_path)

# Call the predict function
confidences, face_with_mask = predict(input_image)

# Extract the results
real_confidence = confidences['real']
fake_confidence = confidences['fake']

print(f" (Real Confidence: {real_confidence:.4f}, Fake Confidence: {fake_confidence:.4f})")

```

(Real Confidence: 0.0001, Fake Confidence: 0.9999)

```

[ ]: interface = gr.Interface(
    fn=predict,
    inputs=[
        gr.Image(label="Input Image", type="pil")
    ],
    outputs=[
        gr.Label(label="Class"),
        gr.Image(label="Face with Explainability", type="pil")
    ],
).launch()

```

Setting queue=True in a Colab notebook requires sharing enabled. Setting `share=True` (you can turn this off by setting `share=False` in `launch()` explicitly).

Colab notebook detected. To show errors in colab notebook, set debug=True in launch()

Running on public URL: <https://f790c5182731709aa0.gradio.live>

This share link expires in 72 hours. For free permanent hosting and GPU upgrades, run ``gradio deploy`` from Terminal to deploy to Spaces (<https://huggingface.co/spaces>)

<IPython.core.display.HTML object>

[]: