StyleGAN3, StyleGAN-fun, dragGAN

Alias-Free Generative Adversarial Networks

- StyleGAN install und usage instructions
- StyleGAN3 - Training
- Handling errors specific to stylegan
    - Setting up PyTorch plugin "bias_act_plugin"... Failed!
- StyleGAN workshop Dangerzones
- Workshop

StyleGAN install und usage instructions

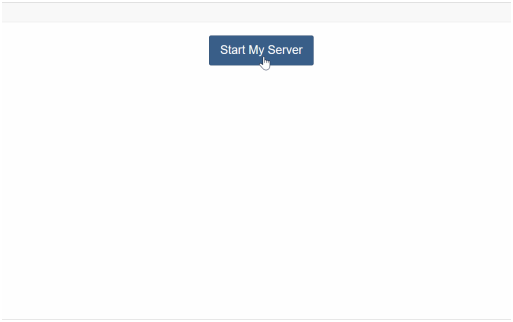
Setup Remote Jupyterhub Notebook

1. Signing into Jupyterhub

Login to JupyterHub with your cluster credentials here

Choose an XS or S slice

> make sure to choose cuda 11.7 from the dropdown



2. Installing Stylegan3

```
conda init bash
```

```
source ~/.bashrc
```

```
git clone https://github.com/NVlabs/stylegan3.git
```

```
cd stylegan3
```

```
conda env create -f environment.yml
```

```
conda activate stylegan3
```

```
conda install cudatoolkit
```

downloading models

make 'pretrained' directory

```
mkdir pretrained
```

ffhq flicker faces

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/j06LuPxYHRRtnQE/download -O pretrained/ffhq_faces.pkl
```

Wikiart

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/tbjJS7XBezbAC3B/download -O pretrained/wikiart.pkl
```

Metfaces

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/eFZAmR6dDLelSo7/download -O pretrained/metfaces.pkl
```

Setup Local Stylegan

1. Refer to the Github Page

For major installation process refer to the [stylegan3 GitHub Page.]

This is an in-depth YouTube tutorial on [how to install stylegan3 locally]

2. Installing Stylegan3

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conda init bash
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```

Inference

For generating single images and videos, you may follow these steps.

activating conda environment

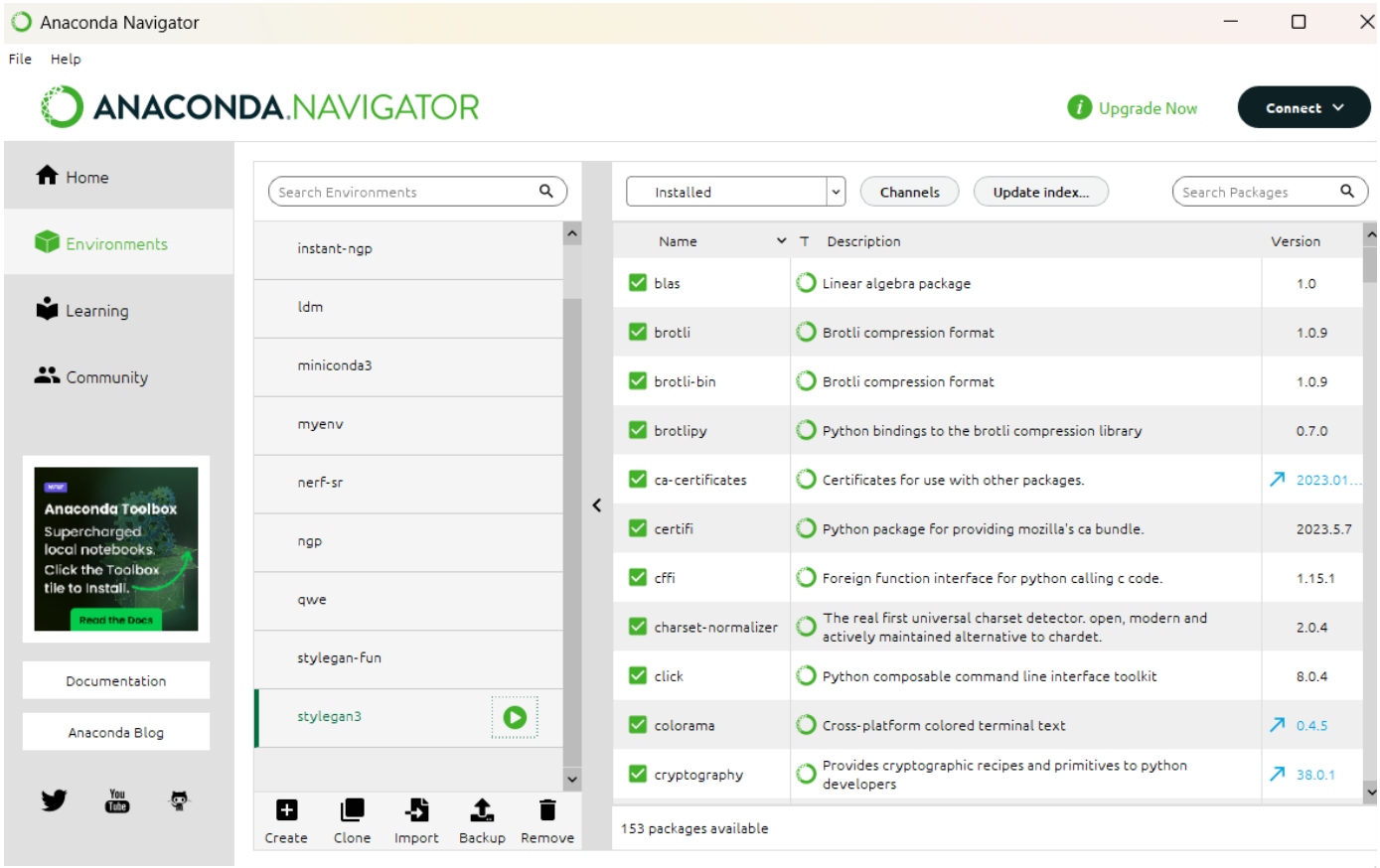
> this needs to be done before every session if you want to use stylegan

```
conda init bash
```

```
source ~/.bashrc
```

```
conda activate stylegan3
```

alternatively if you are not able to activate stylegan3 through the terminal on our workstations, you can use the anaconda Navigator and start the terminal with the environment activated:



inference images

```
python gen_images.py --outdir=out --trunc=1 --seeds=2 --network=https://api.ngc.nvidia.com/v2/models/nvidia/research/stylegan3/versions/1/files/stylegan3-r-afhqv2-512x512.pkl
```

inference video

```
python gen_video.py --output=out/wikiart.mp4 --trunc=1 --seeds=0-31 --network=pretrained/wikiart.pkl
```

Training

For training your own datasets, you can follow these steps.

For your own dataset make sure that your training data has the correct resolution. You may use either 1024x1024, 512x512 or 256x256 resolution. The chosen resolution has to match with the pre-existing dataset that you want to train on.
You may start a dataset from scratch, just be aware that generally training your collected images on a pre-existing dataset will usually give better results (and faster ones too).

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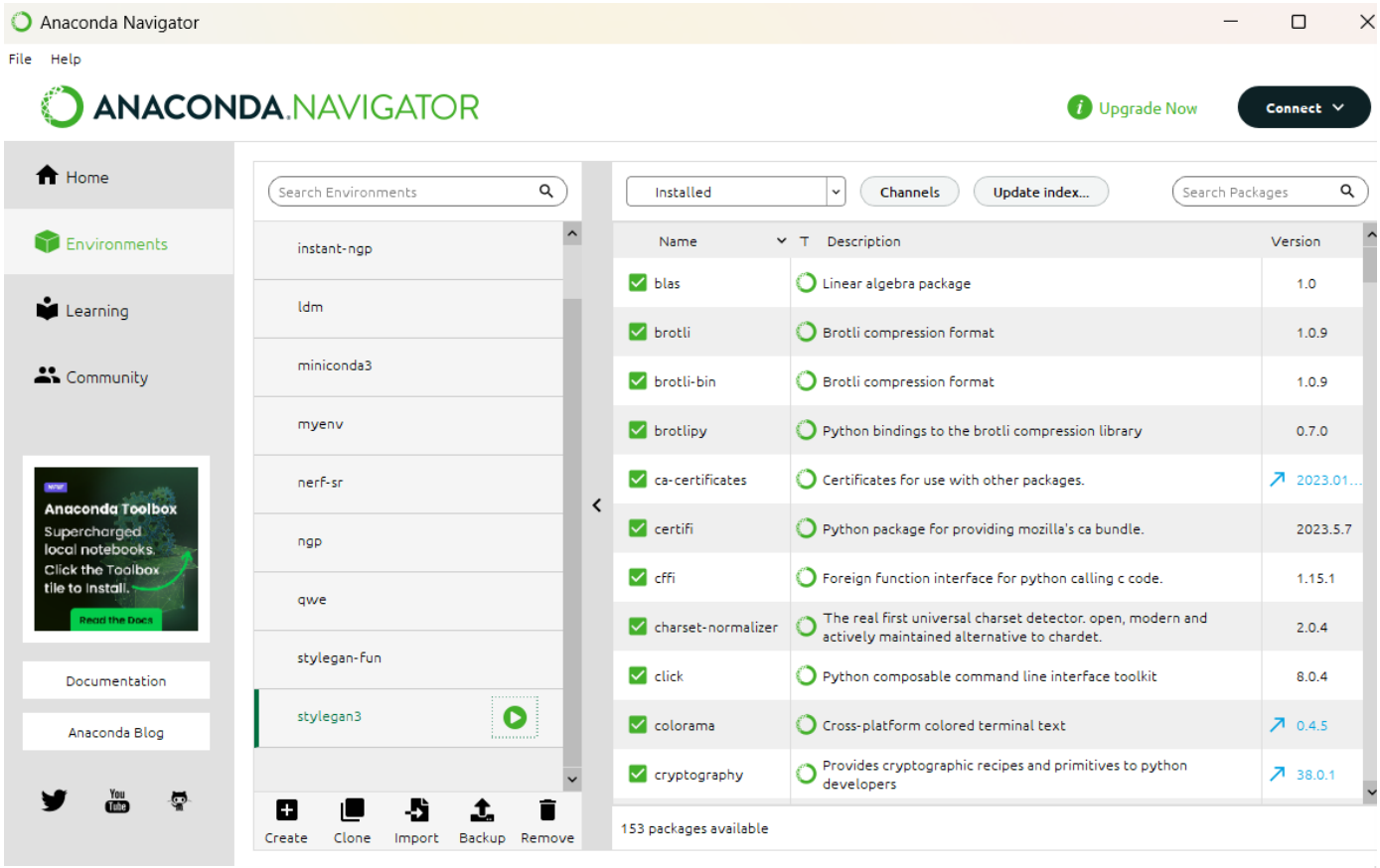


Dowload Training data

If not done before, set up a new directory for the training data

```
mkdir trainingdata
```

If you want to download your trainingdata from a sciebo folder, you may use this code. Instead of the given link you may use your own one.

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/7SzJ55ZroKPf5zY/download -O trainingdata/group01.zip
```

```
wget --no-check-certificate --content-disposition https://api.ngc.nvidia.com/v2/models/nvidia/research/stylegan3/versions/1/files/stylegan3-t-afhqv2-512x512.pkl -O datasets/stylegan3-t-afhqv2-512x512.pkl
```

https://api.ngc.nvidia.com/v2/models/nvidia/research/stylegan3/versions/1/files/stylegan3-t-afhqv2-512x512.pkl

Prepare training data

Before training, it is highly recommended to check your dataset through the given stylegan3 check-up. It can resize your images too, although it is usually better to do it before on your own. (Adobe Bridge is a great tool for batch processing.)

```
python dataset_tool.py --source=trainingdata/group01.zip --dest=trainingdata/group01.zip --resolution=512x512
```

--source= your directory with the given files
--destination= the output directory, dont forget to add .zip at the end
--resolution= resolution you want your images to be saved in. (1024x1024, 512x512 or 256x256 resolution)

start training

```
python train.py --outdir=~/training-runs --cfg=stylegan3-t --data=~/datasets/afhqv2-512x512.zip --gpus=8 --batch=32 --gamma=8.2 --mirror=1
```

--outdir= direction where you want to save the trained data
--data= your dataset you want to use
--gpus= depends on the gpus you have. usually 1 will be
--batch=

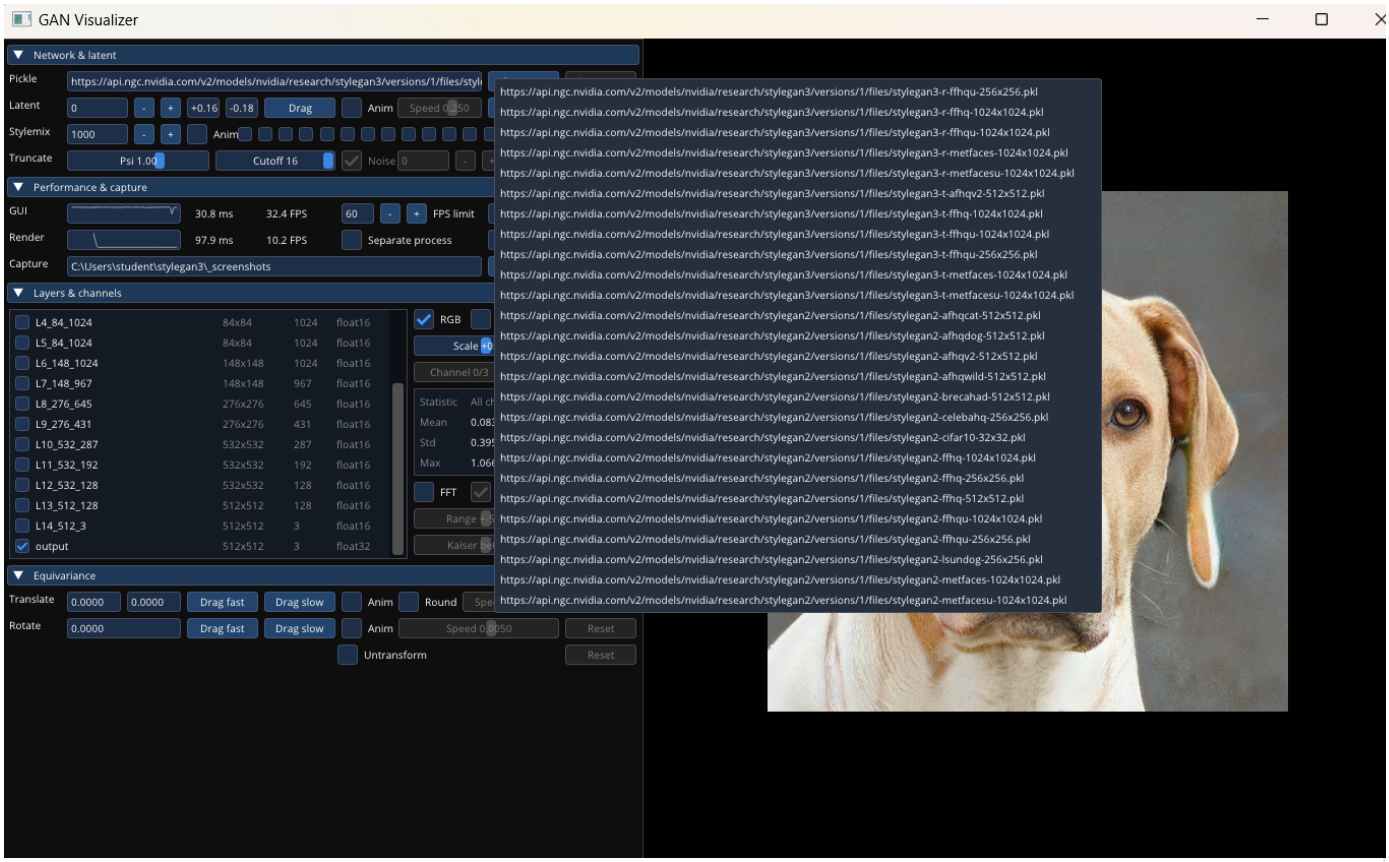
```
python train.py --outdir=~/training-runs --cfg=stylegan3-t --data=~/trainingdata/(...)  --gpus=1 --batch=8 --gamma=2 --snap=20 --resume=~/datasets/afhqv2-512x512.zip
```

Opening the Python Visualizer

Python Visualizer

The following script will open the python Visualizer

```
python visualizer.py
```



You can open one of the .pkl files that NVIDIA provided or paste a local URL to your own trainingdata to visualize and play around.

...

StyleGAN3 - Training

Dowload Training data

training data

Group 01

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/7SzJ55ZroKPf5zY/download
```

Group 03

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/YGR7BaeoIBSePNl/download
```

Group 05

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/b1I0rgEaPcyaP44/download
```

Handling errors specific to stylegan

Handling errors specific to stylegan

Setting up PyTorch plugin "bias_act_plugin"... Failed!

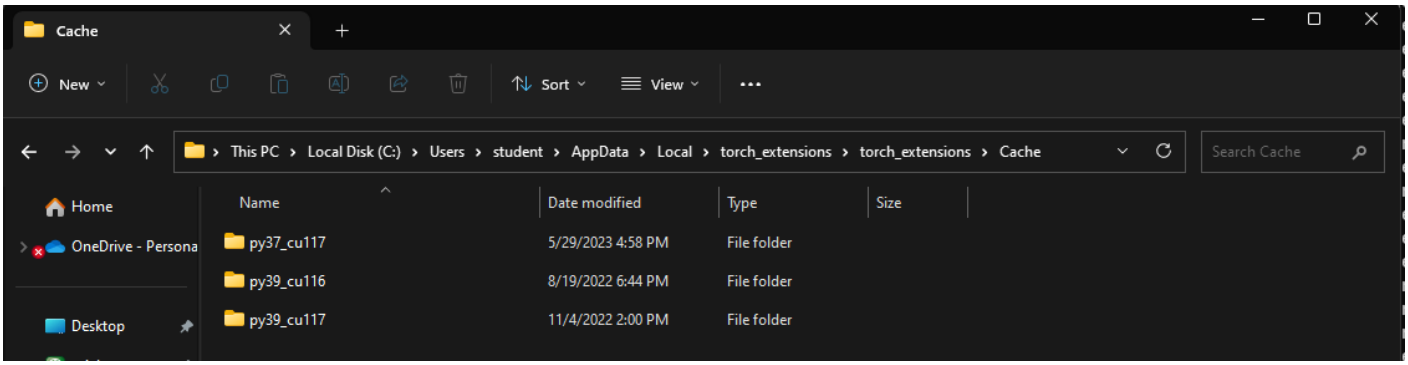
This error sometimes occurs if styleGAN is running inference and then interrupted.
Some cache files remain and they prevent the bias_act_plugin to be loaded, next time styleGAN is run.

From:

C:\Users*USER*\AppData\Local\torch_extensions\torch_extensions\Cache

there are a few folders called:
□□py37_cu117
□□py39_cu116

delete all of them.



StyleGAN workshop Dangerzones

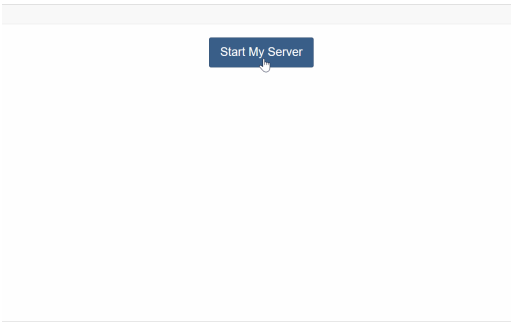
Setup Remote Jupyterhub Notebook

1. Signing into Jupyterhub via keycloak

key in your keycloak credentials here

Choose an XS slice

> make sure to choose cuda 11.7 from the dropdown



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Metfaces

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inference video

```
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```

Training

For training your own datasets, you can follow these steps.

Dowload Training data

```
mkdir trainingdata
```

Group 01

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/7SzJ55ZroKPf5zY/download -O trainingdata/group01.zip
```

Group 02

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/7SzJ55ZroKPf5zY/download -O trainingdata/group02.zip
```

Group 03

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/YGR7BaeoIBSePNl/download -O trainingdata/group03.zip
```

Group 04

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/SsrPKyPcyswd8z2/download -O trainingdata/group04.zip
```

Group 05

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/b1I0rgEaPcyaP44/download -O trainingdata/group05
```

Group 06

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/Orv9FDqqKwtBMlB/download -O trainingdata/group06
```

Prepare training data

```
python dataset_tool.py --source=trainingdata/group01.zip --destination=trainingdata/group01 --resolution=512x512
```

start training

```
python train.py --help
```

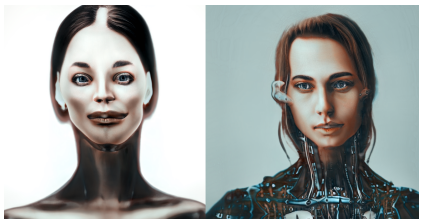
Downloading the DangerzonesGANs

downloading dangerzones models

go into directory pretrained:

```
cd pretrained
```

Download our trained models from the KISD Modelzoo:



Group 01 - androids gynoids

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/B7rOZIRzPN5rev1/download -O pretrained/group_01_220.pkl
```

Group 02 TBF - dataset error

Group 03 - grayscale faces

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/SRcjw6DPv9AIacn/download -O pretrained/group_03_500.pkl
```

Group 04 -future cities

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/CW8uQ2dsQbVOiXa/download -O pretrained/group_04_20.pkl
```

Group 05 - lamppost and sunflowers

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/fb0skqUV9ypIOEl/download -O pretrained/group_05.pkl
```

Group 05 - encoded data

Workshop

Setup Remote Jupyterhub Notebook

1. Signing into Jupyterhub

Login to JupyterHub with your cluster credentials here

Choose an XS or S slice

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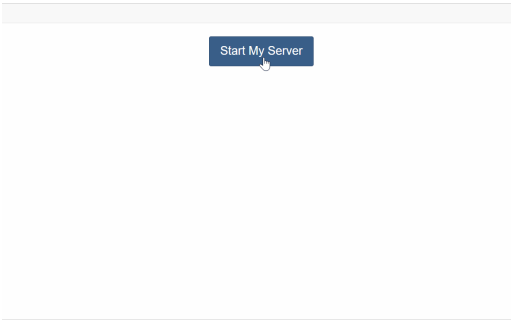

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```

```
cd stylegan3
```

```
conda env create -f environment.yml
```

```
conda activate stylegan3
```

```
conda install cudatoolkit
```

```
pip install torch torchvision
```

```
conda install psutil
```

Training

For training your own datasets, you can follow these steps.

For your own dataset make sure that your training data has the correct resolution. You may use either 1024x1024, 512x512 or 256x256 resolution. The chosen resolution has to match with the pre-existing dataset that you want to train on.
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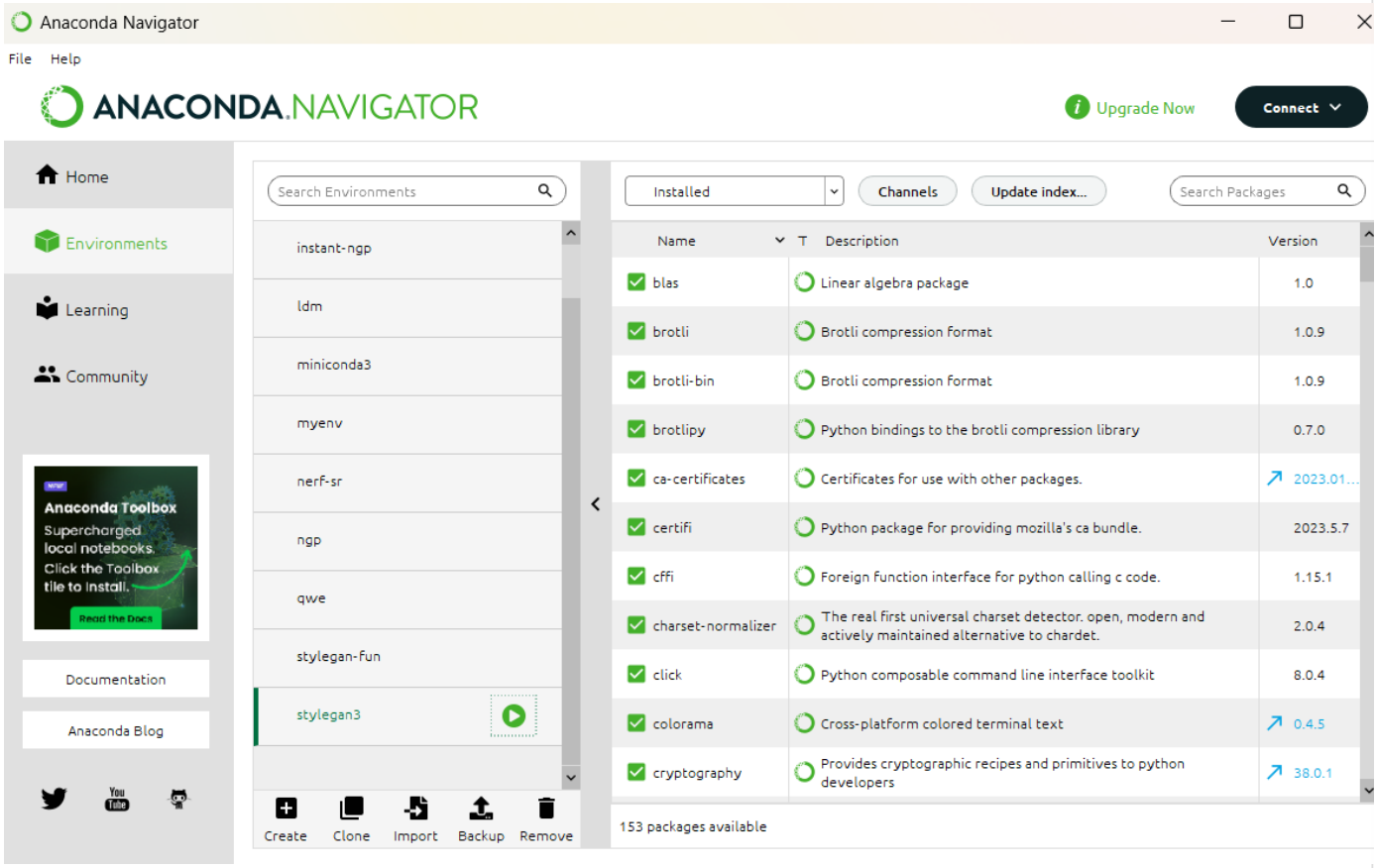

Dowload Training data

If not done before, set up a new directory for the training data

```
mkdir trainingdata
```

in the trainingdata folder: set up a new folder (for example called imgs) and upload your images

If you want to download your trainingdata from a sciebo folder, you may use this code. Instead of the given link you may use your own one.

```
wget --no-check-certificate --content-disposition https://th-koeln.sciebo.de/s/7SzJ55ZroKPf5zY/download -O trainingdata/group01.zip
```

```
wget --no-check-certificate --content-disposition https://api.ngc.nvidia.com/v2/models/nvidia/research/stylegan3/versions/1/files/stylegan3-t-afhqv2-512x512.pkl -O datasets/stylegan3-t-afhqv2-512x512.pkl
```

https://api.ngc.nvidia.com/v2/models/nvidia/research/stylegan3/versions/1/files/stylegan3-t-afhqv2-512x512.pkl

Prepare training data

Before training, it is highly recommended to check your dataset through the given stylegan3 check-up. It can resize your images too, although it is usually better to do it before on your own. (Adobe Bridge is a great tool for batch processing.)

```
python dataset_tool.py --source=trainingdata/imgs/ --dest=trainingdata/group01.zip --resolution=512x512
```

--source= your directory with the given files
--destination= the output directory, dont forget to add .zip at the end
--resolution= resolution you want your images to be saved in. (1024x1024, 512x512 or 256x256 resolution)

start training

```
python train.py --outdir=/home/jovyan/stylegan3/training-runs --cfg=stylegan3-t --data=/home/jovyan/stylegan3/trainingdata/group01.zip  --gpus=1 --batch=8 --gamma=2 --snap=20 --resume="https://api.ngc.nvidia.com/v2/models/nvidia/research/stylegan3/versions/1/files/stylegan3-t-afhqv2-512x512.pkl"
```

--outdir= direction where you want to save the trained data
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Opening the Python Visualizer

Python Visualizer

The following script will open the python Visualizer

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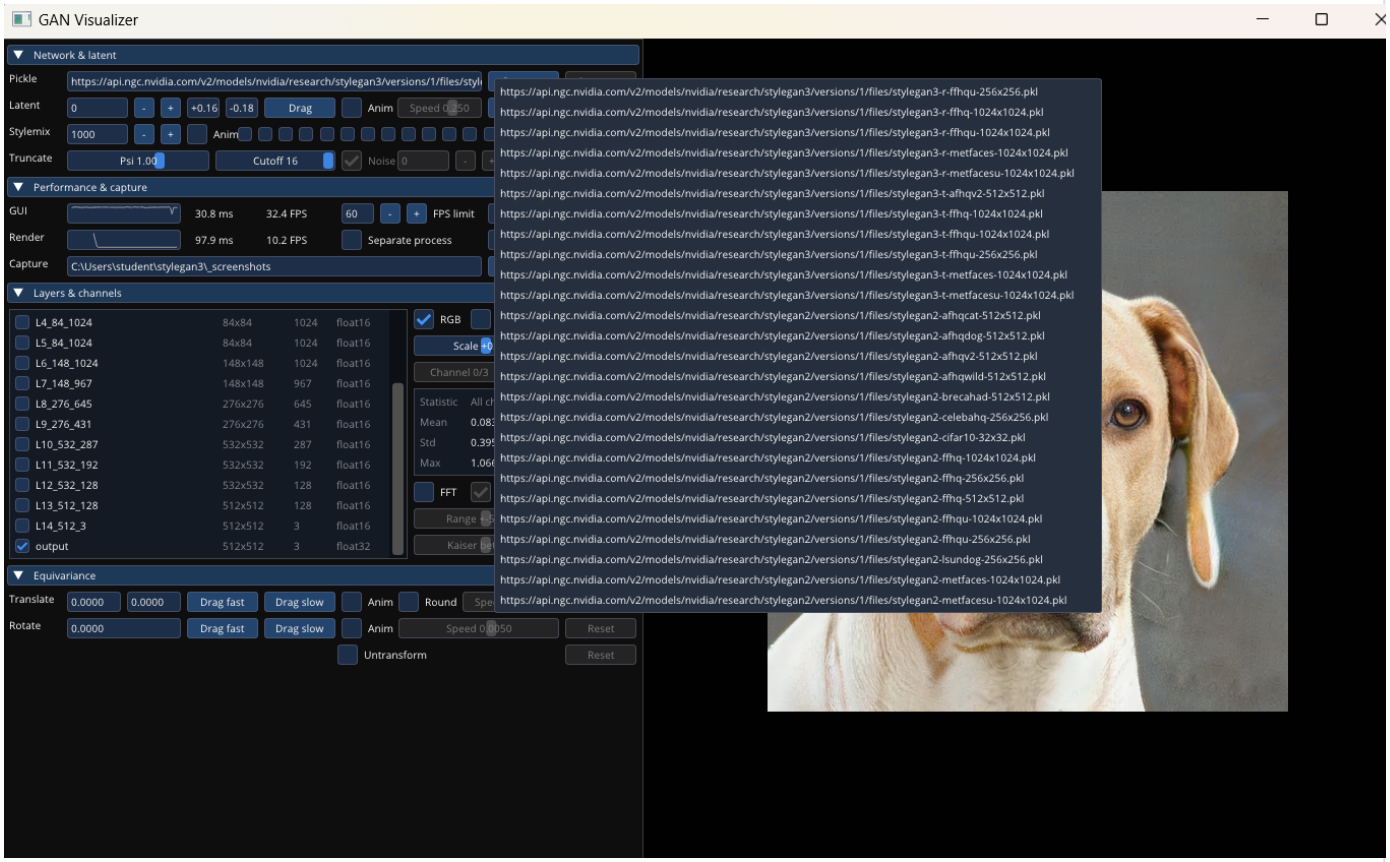

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