fid

April 21, 2021

1 FID score computation (Python kernel)

1.1 Preparation

[1]:
```
!pip install fid-score
```

```
Requirement already satisfied: fid-score in
/Library/Frameworks/Python.framework/Versions/3.8/lib/python3.8/site-packages
(0.1.3)
Requirement already satisfied: numpy>=1.18.1 in
/Library/Frameworks/Python.framework/Versions/3.8/lib/python3.8/site-packages
(from fid-score) (1.18.5)
Requirement already satisfied: scipy==1.3.2 in
/Library/Frameworks/Python.framework/Versions/3.8/lib/python3.8/site-packages
(from fid-score) (1.3.2)
Requirement already satisfied: pillow>=7.0.0 in
/Library/Frameworks/Python.framework/Versions/3.8/lib/python3.8/site-packages
(from fid-score) (7.0.0)
WARNING: You are using pip version 20.2.3; however, version 21.0.1 is
available.
You should consider upgrading via the
'/Library/Frameworks/Python.framework/Versions/3.8/bin/python3.8 -m pip install
--upgrade pip' command.
```

[2]:
```
from fid_score import fid_score
import os
import torch
```

1.2 Computation implementation

[3]:
```
def compute_fid_score(input_path, output_path):
    batch_size = len(os.listdir(input_path))
    device = torch.device("cuda" if torch.cuda.is_available() else "cpu")
    fid = fid_score.FidScore([input_path, output_path], device, batch_size)
```

```
    score = fid.calculate_fid_score()
    return score
```

1.3 FID Score of flowers dataset: BigbiGan

[4]:
```
score = compute_fid_score("./bigbigan_flower_results/inputs", "./
↪bigbigan_flower_results/recons")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/32
100%|
                  | 1/1 [00:01<00:00,  1.41s/it]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/32
100%|
                  | 1/1 [00:00<00:00,  1.20it/s]
done
```

[5]:
```
print(score)
```

```
255.47937789059603
```

1.4 FID Score of datasets: SNGAN (iteration 500)

[7]:
```
score_flower = compute_fid_score("./sngan_flower_results/input", "./
↪sngan_flower_results/iter_500")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/32
100%|
                  | 1/1 [00:00<00:00,  1.09it/s]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/32
```

```
100%|
                  | 1/1 [00:01<00:00,  1.80s/it]
done
```

[4]:
```
score_face = compute_fid_score("./sngan_face_results/input", "./
↪sngan_anime_results/iter_500")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|
                  | 1/1 [00:01<00:00,  1.68s/it]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
100%|
                  | 1/1 [00:01<00:00,  1.03s/it]
done
```

[5]:
```
score_anime = compute_fid_score("./sngan_anime_results/input", "./
↪sngan_anime_results/iter_500")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|
                  | 1/1 [00:02<00:00,  2.27s/it]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
100%|
                  | 1/1 [00:03<00:00,  3.41s/it]
done
```

[8]:
```
print(score_flower)
print(score_face)
print(score_anime)
```

```
332.537125466257
336.60344159951177
201.4228847286517
```

1.5 FID Score of datasets: SNGan (iteration 2000)

[9]:
```
score_flower = compute_fid_score("./sngan_flower_results/input", "./
↪sngan_flower_results/iter_2000")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/32
100%|
                  | 1/1 [00:00<00:00,  1.47it/s]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/32
100%|
                  | 1/1 [00:00<00:00,  1.59it/s]
done
```

[13]:
```
score_face = compute_fid_score("./sngan_face_results/input", "./
↪sngan_face_results/iter_2000")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|
                  | 1/1 [00:00<00:00,  1.01it/s]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
100%|
                  | 1/1 [00:00<00:00,  1.03it/s]
```

```
done
```

[11]:
```
score_anime = compute_fid_score("./sngan_anime_results/input", "./
↪sngan_anime_results/iter_2000")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|
                  | 1/1 [00:06<00:00,  6.93s/it]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
100%|
                  | 1/1 [00:06<00:00,  6.93s/it]
done
```

[14]:
```
print(score_flower)
print(score_face)
print(score_anime)
```

```
254.81347294177573
226.0100256826691
187.9828476664778
```

1.6 FID Score of dataset: SNGan (iteration 5000)

[15]:
```
score_flower = compute_fid_score("./sngan_flower_results/input", "./
↪sngan_flower_results/iter_5000")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/32
100%|
                  | 1/1 [00:00<00:00,  1.47it/s]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/32
```

```
100%|
                  | 1/1 [00:00<00:00,  1.60it/s]
done
```

[16]:
```
score_face = compute_fid_score("./sngan_face_results/input", "./
↪sngan_face_results/iter_5000")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|
                  | 1/1 [00:01<00:00,  1.13s/it]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
100%|
                  | 1/1 [00:01<00:00,  1.29s/it]
done
```

[17]:
```
score_anime = compute_fid_score("./sngan_anime_results/input", "./
↪sngan_anime_results/iter_5000")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|
                  | 1/1 [00:02<00:00,  2.59s/it]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
100%|
                  | 1/1 [00:02<00:00,  2.98s/it]
done
```

[18]:
```
print(score_flower)
print(score_face)
print(score_anime)
```

```
222.52662160924808
218.6088672817818
182.02618992355283
```

1.7 FID Score of datasets: BigGan (iteration 500)

1.7.1 flowers

[11]:
```
score_flowers = compute_fid_score("./biggan_flower_results/input", "./
↪biggan_flower_results/iter_500")
```

```
  0%|          | 0/1 [00:00<?, ?it/s]
Warning: batch size is bigger than the data size. Setting batch size to data
size
Present batch 1/32
100%|      | 1/1 [00:07<00:00,  7.14s/it]
  0%|          | 0/1 [00:00<?, ?it/s]
done
Present batch 1/32
100%|      | 1/1 [00:07<00:00,  7.47s/it]
done
```

[12]:
```
print(score_flowers)
```

```
354.2478363067756
```

1.7.2 face

[14]:
```
score_face = compute_fid_score("./biggan_face_results/input", "./
↪biggan_face_results/iter_500")
```

```
  0%|          | 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|      | 1/1 [00:12<00:00, 12.68s/it]
  0%|          | 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
```

```
100%|      | 1/1 [00:12<00:00, 12.31s/it]
done
```

[15]:
```
print(score_face)
```

```
297.0267565609573
```

1.7.3 anime

[16]:
```
score_anime = compute_fid_score("./biggan_anime_results/input", "./
↪biggan_anime_results/iter_500")
```

```
  0%|          | 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|      | 1/1 [00:11<00:00, 11.76s/it]
  0%|          | 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
100%|      | 1/1 [00:11<00:00, 11.32s/it]
done
```

[17]:
```
print(score_anime)
```

```
302.92827899220856
```

1.8 FID Score of datasets: BigGan (iteration 2000)

1.8.1 flowers

[18]:
```
score_flowers = compute_fid_score("./biggan_flower_results/input", "./
↪biggan_flower_results/iter_2000")
```

```
  0%|          | 0/1 [00:00<?, ?it/s]
Warning: batch size is bigger than the data size. Setting batch size to data
size
Present batch 1/32
100%|      | 1/1 [00:07<00:00,  7.38s/it]
  0%|          | 0/1 [00:00<?, ?it/s]
```

```
done
Present batch 1/32
100%|      | 1/1 [00:07<00:00,  7.22s/it]
done
```

[19]:
```
print(score_flowers)
```

```
331.00914755717827
```

1.8.2 face

[20]:
```
score_face = compute_fid_score("./biggan_face_results/input", "./
↪biggan_face_results/iter_2000")
```

```
  0%|          | 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|      | 1/1 [00:11<00:00, 11.77s/it]
  0%|          | 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
100%|      | 1/1 [00:11<00:00, 11.71s/it]
done
```

[21]:
```
print(score_face)
```

```
220.88891748056722
```

1.8.3 anime

[24]:
```
score_anime = compute_fid_score("./biggan_anime_results/input", "./
↪biggan_anime_results/iter_2000")
```

```
  0%|          | 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|      | 1/1 [00:11<00:00, 11.40s/it]
  0%|          | 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
```

```
100%|      | 1/1 [00:11<00:00, 11.33s/it]
done
```

[25]:
```
print(score_anime)
```

```
260.48219671149366
```

1.9 FID Score of datasets: BigGan (iteration 5000)

1.9.1 flowers

[26]:
```
score_flowers = compute_fid_score("./biggan_flower_results/input", "./
↪biggan_flower_results/iter_5000")
```

```
  0%|          | 0/1 [00:00<?, ?it/s]
Warning: batch size is bigger than the data size. Setting batch size to data
size
Present batch 1/32
100%|      | 1/1 [00:07<00:00,  7.29s/it]
  0%|          | 0/1 [00:00<?, ?it/s]
done
Present batch 1/32
100%|      | 1/1 [00:07<00:00,  7.08s/it]
done
```

[27]:
```
print(score_flowers)
```

```
284.15060774270194
```

1.9.2 face

[28]:
```
score_face = compute_fid_score("./biggan_face_results/input", "./
↪biggan_face_results/iter_5000")
```

```
  0%|          | 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|      | 1/1 [00:11<00:00, 11.59s/it]
  0%|          | 0/1 [00:00<?, ?it/s]
```

```
done
Present batch 1/50
100%|      | 1/1 [00:11<00:00, 11.41s/it]
done
```

[29]:
```
print(score_face)
```

```
188.65339830843695
```

1.9.3 anime

[19]:
```
score_anime = compute_fid_score("./biggan_anime_results/input", "./
↪biggan_anime_results/iter_5000")
```

```
  0%|
| 0/1 [00:00<?, ?it/s]
Present batch 1/50
100%|
                  | 1/1 [00:01<00:00,  1.06s/it]
  0%|
| 0/1 [00:00<?, ?it/s]
done
Present batch 1/50
100%|
                  | 1/1 [00:00<00:00,  1.00it/s]
done
```

[20]:
```
print(score_anime)
```

```
242.5391102139958
```

[ ]:
```

```