

# Deep Bidirectional Gradient Flows for Deep Generative Learning

This repository is the demo implementation of [Bidirectional Gradient Flows for Deep Generative Learning].

## Requirements

To install requirements:

```
pip install -r requirements.txt
```

## Training

To train BGF on toy examples, run this command:

```
python demo_toys.py --outf 'Results/demo_toys'
```

To train BGF on MNIST dataset and get the evaluation results , run this command:

```
python train.py --outf 'Results/MNIST' --nz 128
```

## Pre-trained Models

DDR does not adopt the pre-trained models. However, to save the time and expenses of training, we provide the trained models that can avoid the afresh training. To evaluate DDR on MNIST with trained models, run:

```
python eval.py --path 'Results/MNIST_trained_16' --latent_dim 16
```

## Results

Our model BGF achieves the following performance on :

[Image performance on MNIST]

BGF	Inception score	FID
MNIST	9.37	2.47
FashionMNIST	7.52	9.24
CIFAR10	7.63	22.34
Celeba	NA	8.51

With trained models, results can be obtained by running

```
python eval.py --path 'Results/MNIST_trained_16' --latent_dim 16
python eval.py --path 'Results/MNIST_trained_32' --latent_dim 32
python eval.py --path 'Results/MNIST_trained_64' --latent_dim 64
```

With the afresh training, results can be obtained by running

```
python train.py --save 'Results/MNIST_16' --latent_dim 16
python train.py --save 'Results/MNIST_32' --latent_dim 32
python train.py --save 'Results/MNIST_64' --latent_dim 64
```