모딥 스터디 12회차

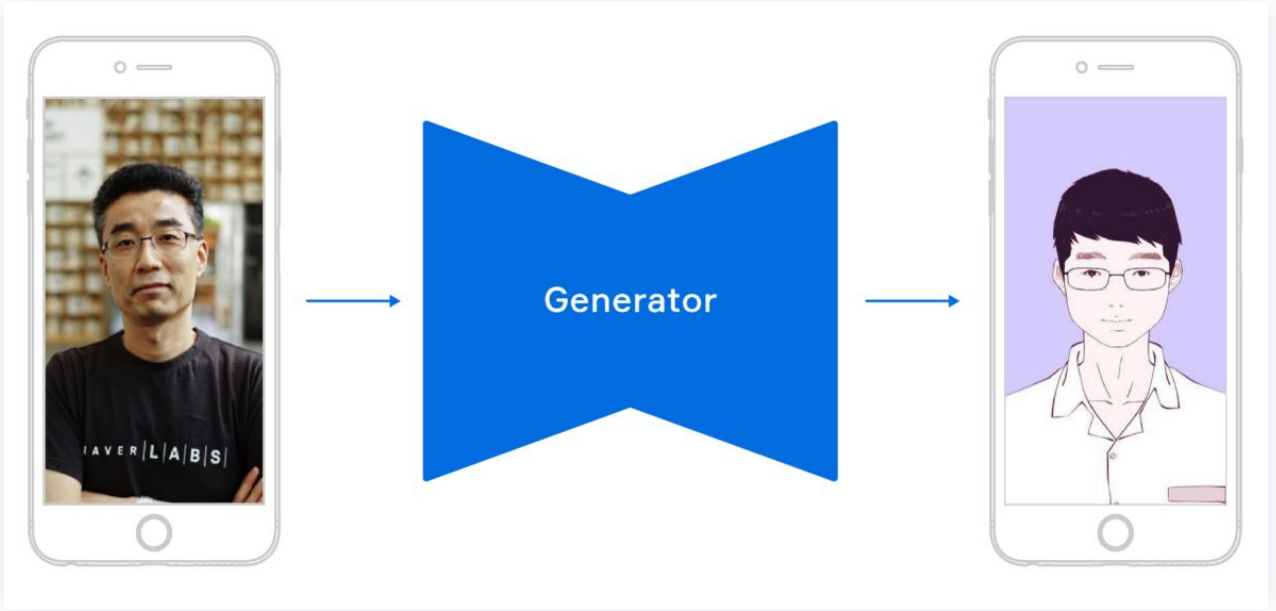
GAN

최원서, 오승현, 김병주, 김민솔

INDEX

GAN

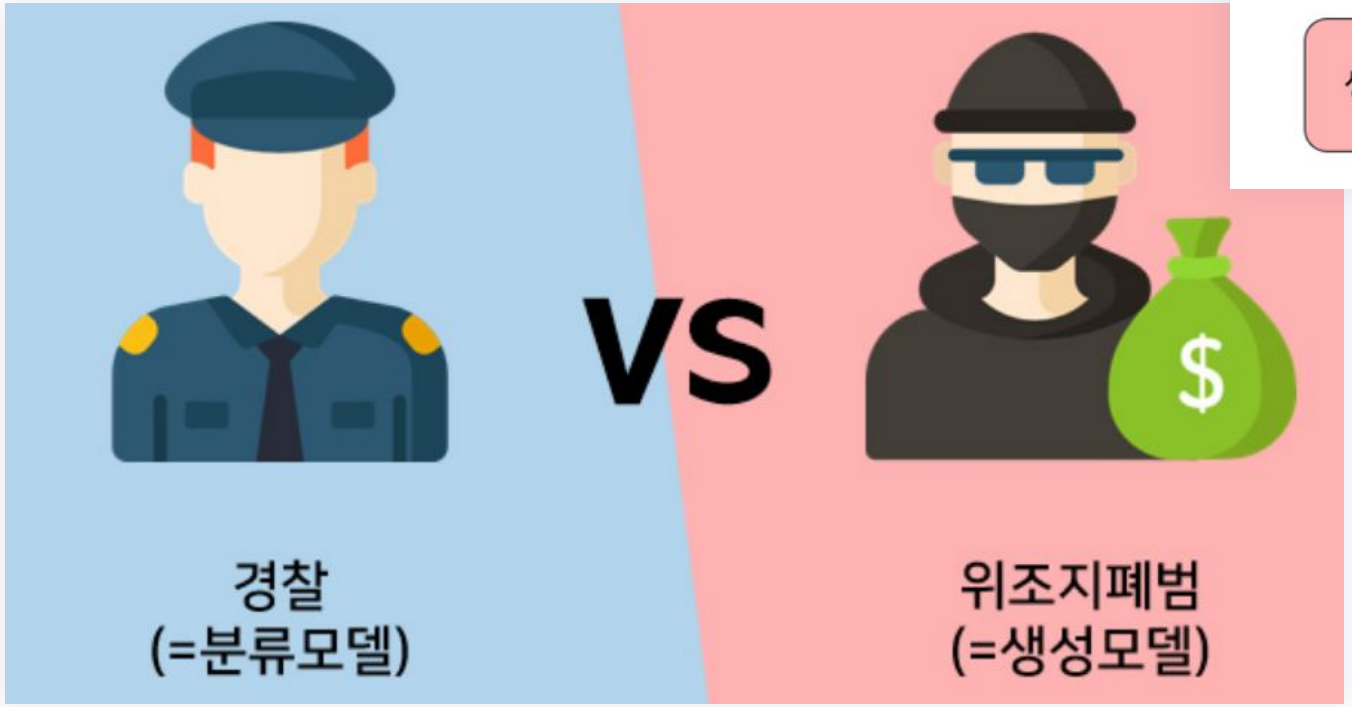
“GAN은 최근 10년간 머신러닝 분야에서 가장 멋진 아이디어다” – 얀 르쿤

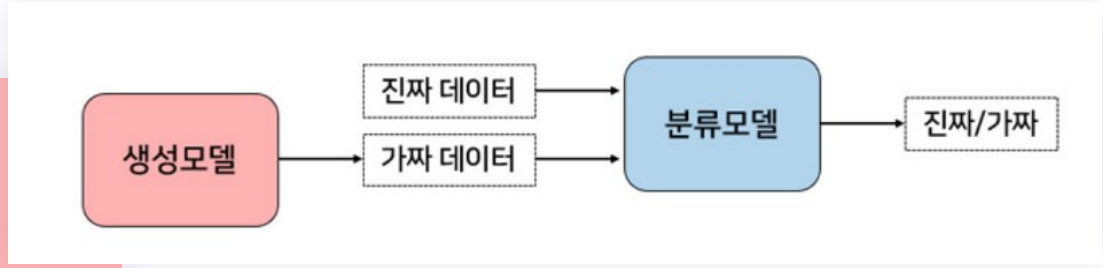


GAN

Generative Adversarial Networks

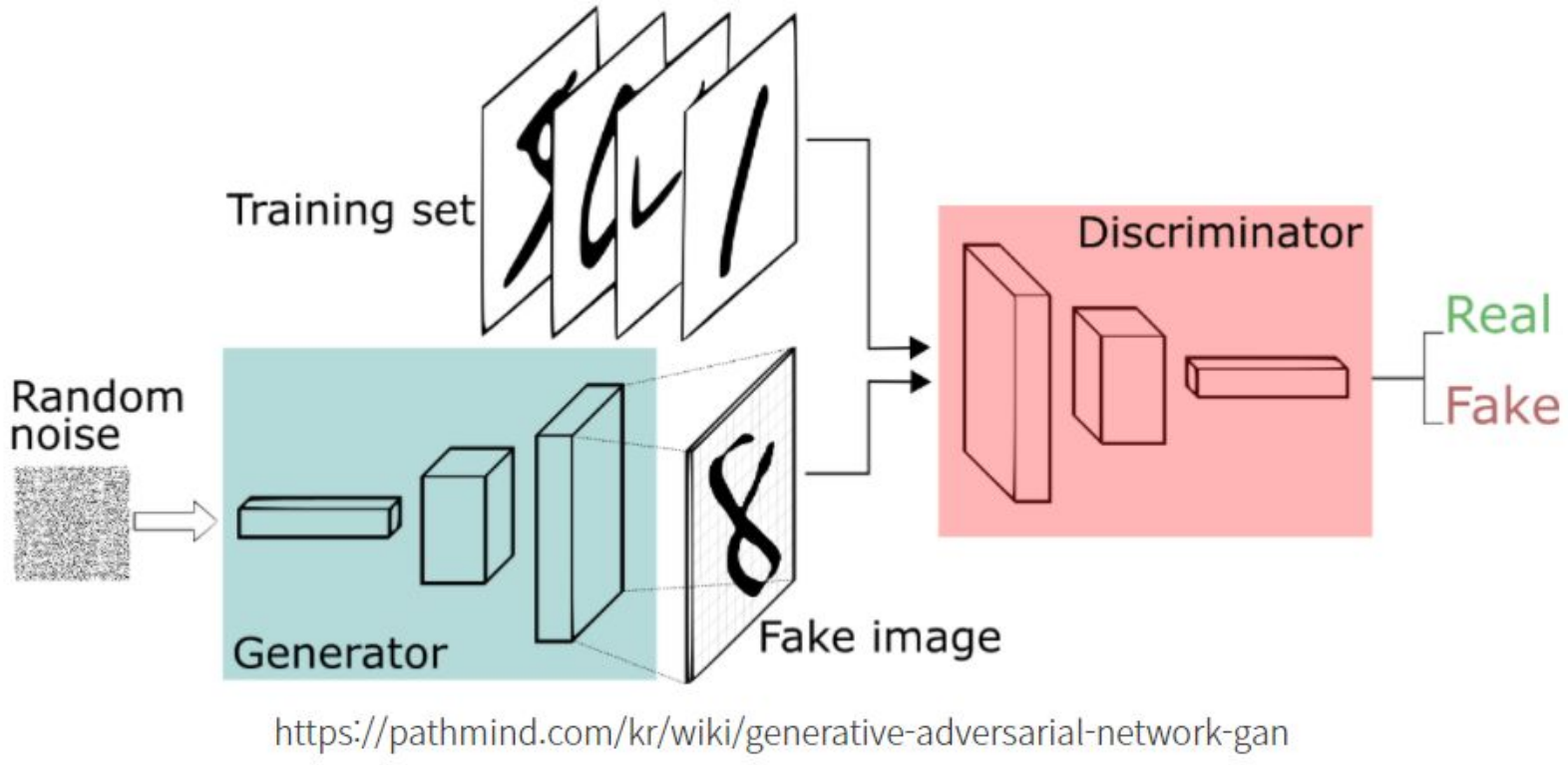
생성적 적대 신경망





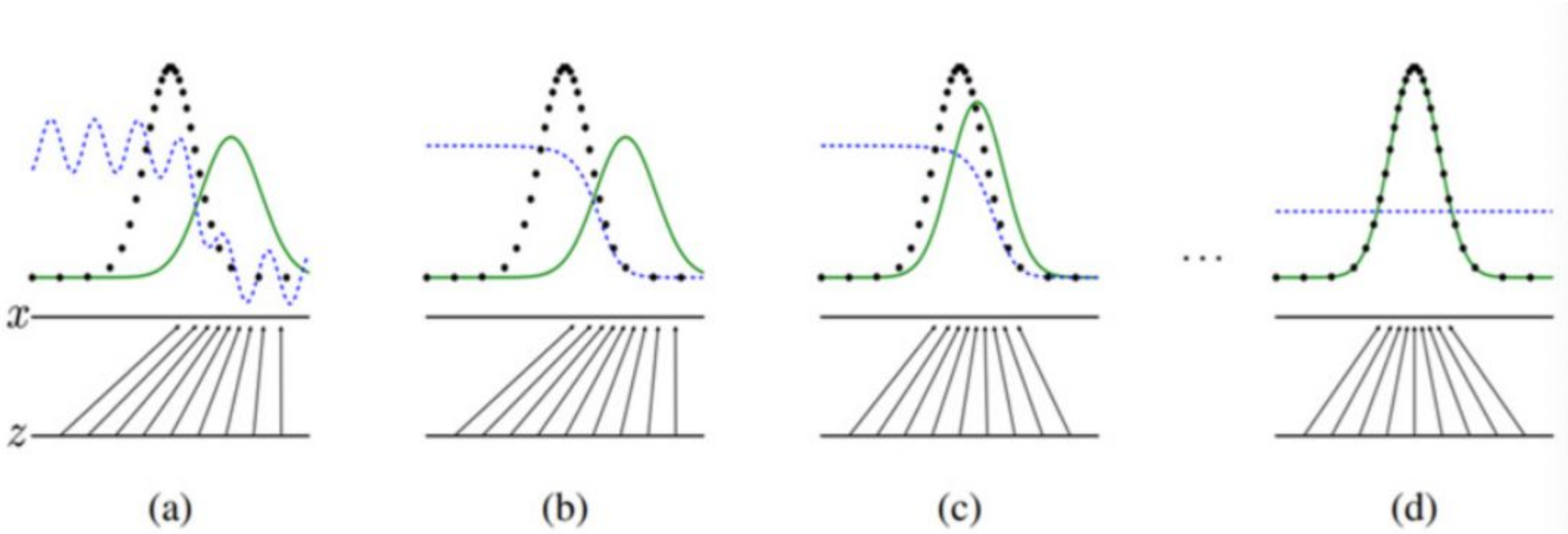
GAN

generator는 임의의 확률분포에서 추출한 랜덤벡터를 input으로 받는다.



https://pathmind.com/kr/wiki/generative-adversarial-network-gan

GAN



※ 검은 점선: 원 데이터의 확률분포, 녹색 점선: GAN이 만들어 내는 확률분포, 파란 점선: 판별자 의 확률분포

DCGAN – generator

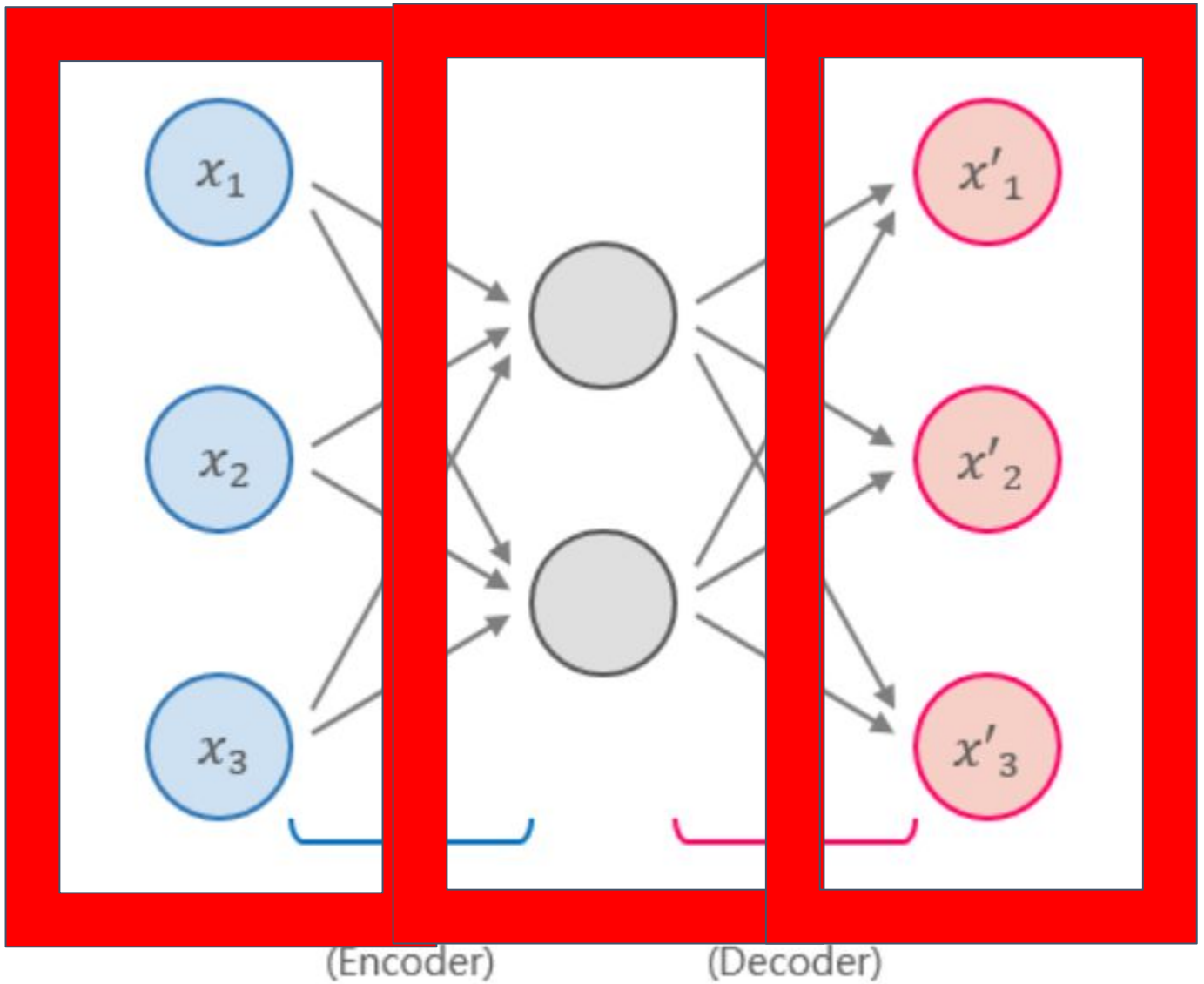
```
generator = Sequential()    # 모델 이름을 generator로 정하고 Sequential() 함수를 호출
generator.add(Dense(128*7*7, input_dim=100, activation=
LeakyReLU(0.2))) … ❶
generator.add(BatchNormalization()) … ❷
generator.add(Reshape((7, 7, 128))) … ❸
generator.add(UpSampling2D()) … ❹
generator.add(Conv2D(64, kernel_size=5, padding='same')) … ❺
generator.add(BatchNormalization()) … ❻
generator.add(Activation(LeakyReLU(0.2))) … ❼
generator.add(UpSampling2D()) … ❽
generator.add(Conv2D(1, kernel_size=5, padding='same', activation=
'tanh')) … ❾
```

DCGAN – discriminator

```
# 모델 이름을 discriminator로 정하고 Sequential() 함수 호출
discriminator = Sequential()
discriminator.add(Conv2D(64, kernel_size=5, strides=2, input_
shape=(28,28,1), padding="same")) … ❶
discriminator.add(Activation(LeakyReLU(0.2))) … ❷
discriminator.add(Dropout(0.3)) … ❸
discriminator.add(Conv2D(128, kernel_size=5, strides=2, padding=
"same")) … ❹
discriminator.add(Activation(LeakyReLU(0.2))) … ❺
discriminator.add(Dropout(0.3)) … ❻
discriminator.add(Flatten()) … ❼
discriminator.add(Dense(1, activation='sigmoid')) … ❽
discriminator.compile(loss='binary_crossentropy', optimizer='adam') … ❾
discriminator.trainable = False
```

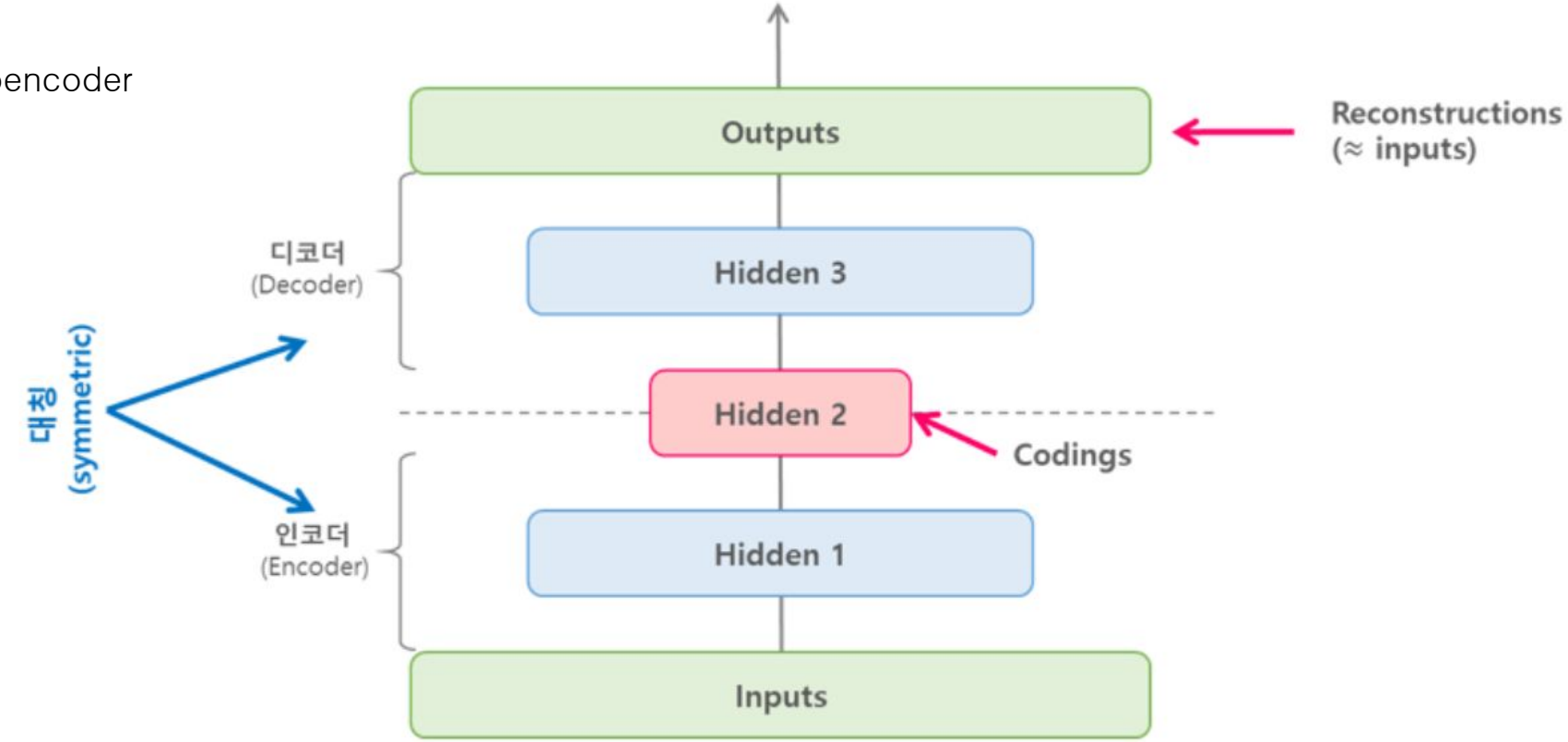
GAN 모델 실습

AutoEncoder



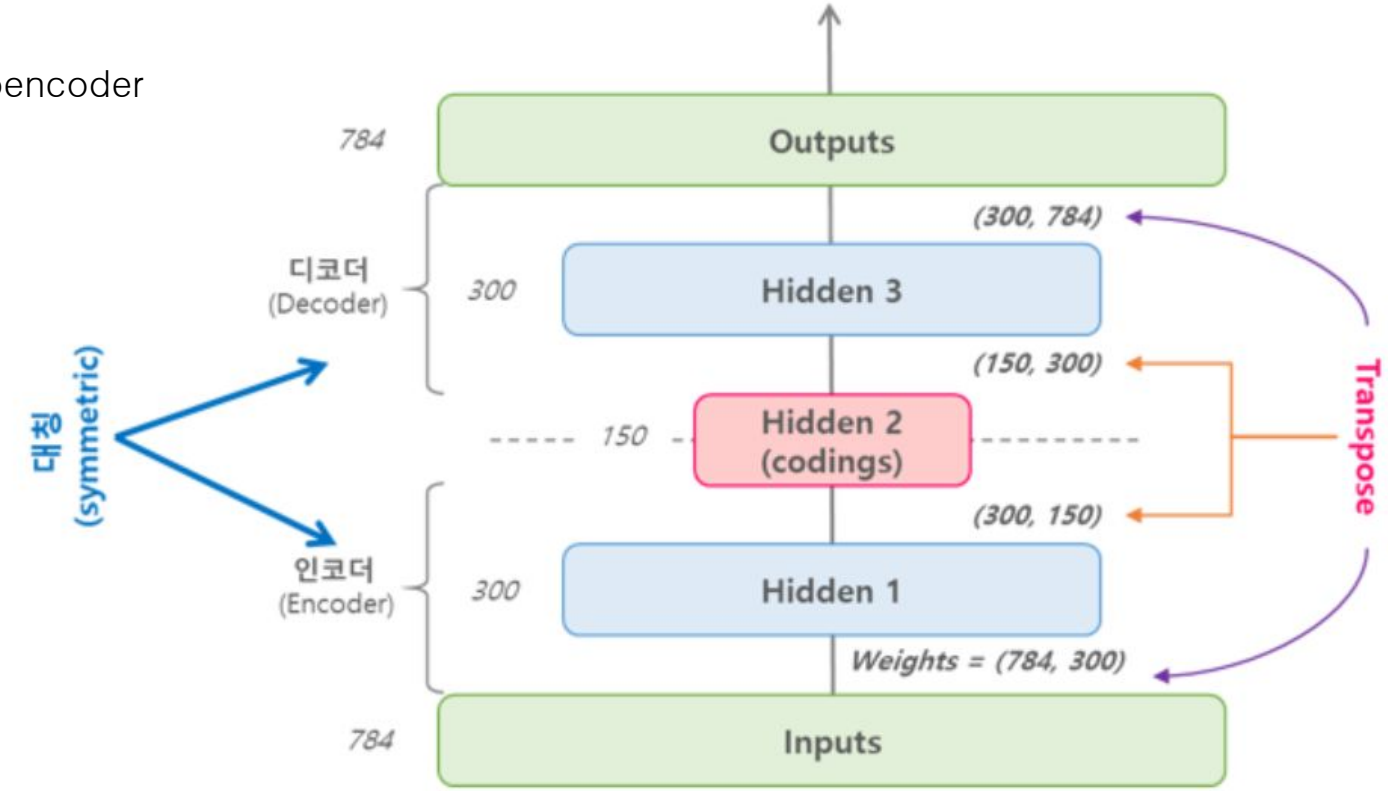
AutoEncoder

stacked autoencoder



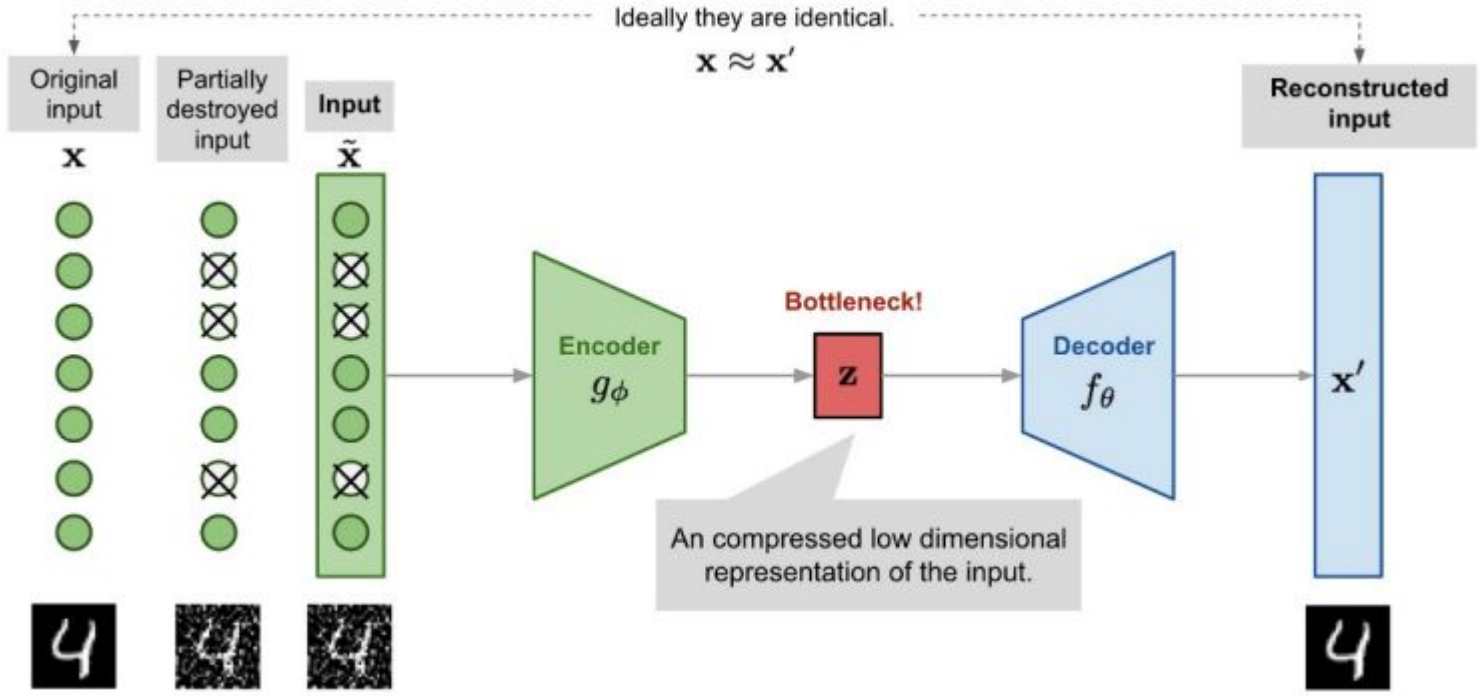
AutoEncoder

stacked autoencoder



AutoEncoder

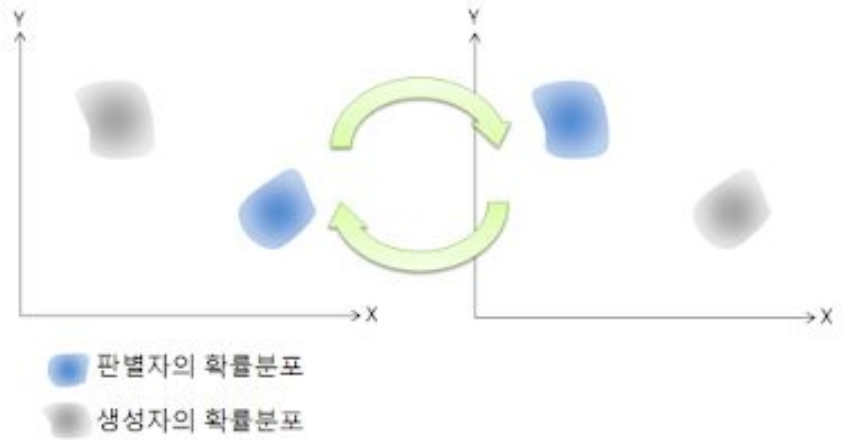
denoising autoencoder

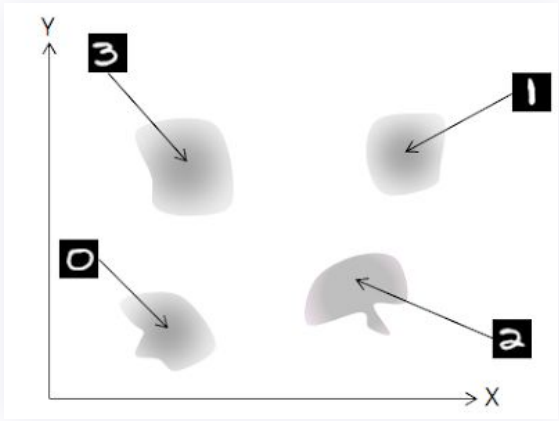


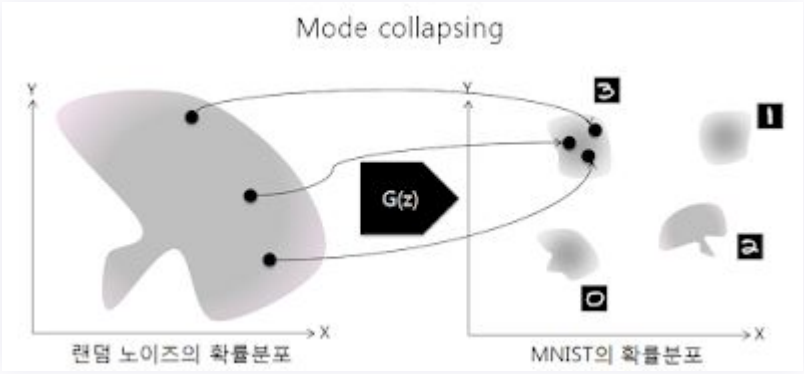
오토인코더 실습 !

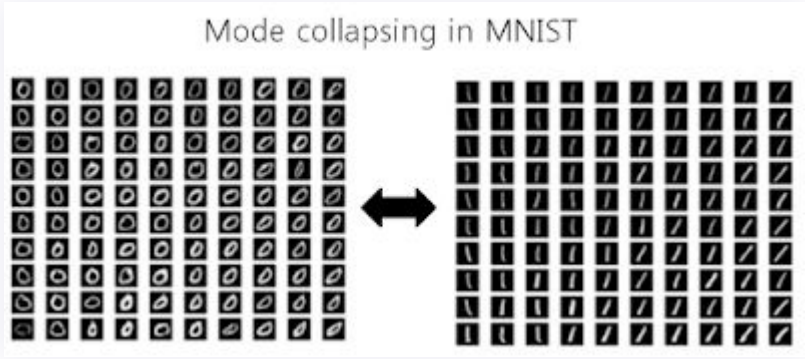
쉬는시간

GAN Model


Y
X
Y
X
판별자의 확률분포
생성자의 확률분포


Y
X


Mode collapsing
G(z)
랜덤 노이즈의 확률분포
MNIST의 확률분포


Mode collapsing in MNIST