

비지도학습

Learning Strategies: Unsupervised Learning

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■ 앞으로 2주간...

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3	Basic of Neural Network → Neural Network의 기본 구조와 동작 방식	대면수업
4	Learning Strategies: Supervised Learning → 지도학습에서의 하이퍼파라미터 튜닝, 규제화, 최적화 방법 학습	대면수업
5	Learning Strategies: Unsupervised Learning → 비지도학습의 동작방식과 학습 방법, 응용 방안 등	대면수업
6	Model Architecture: Convolutional Neural Networks	대면수업
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Introduction to Unsupervised Learning

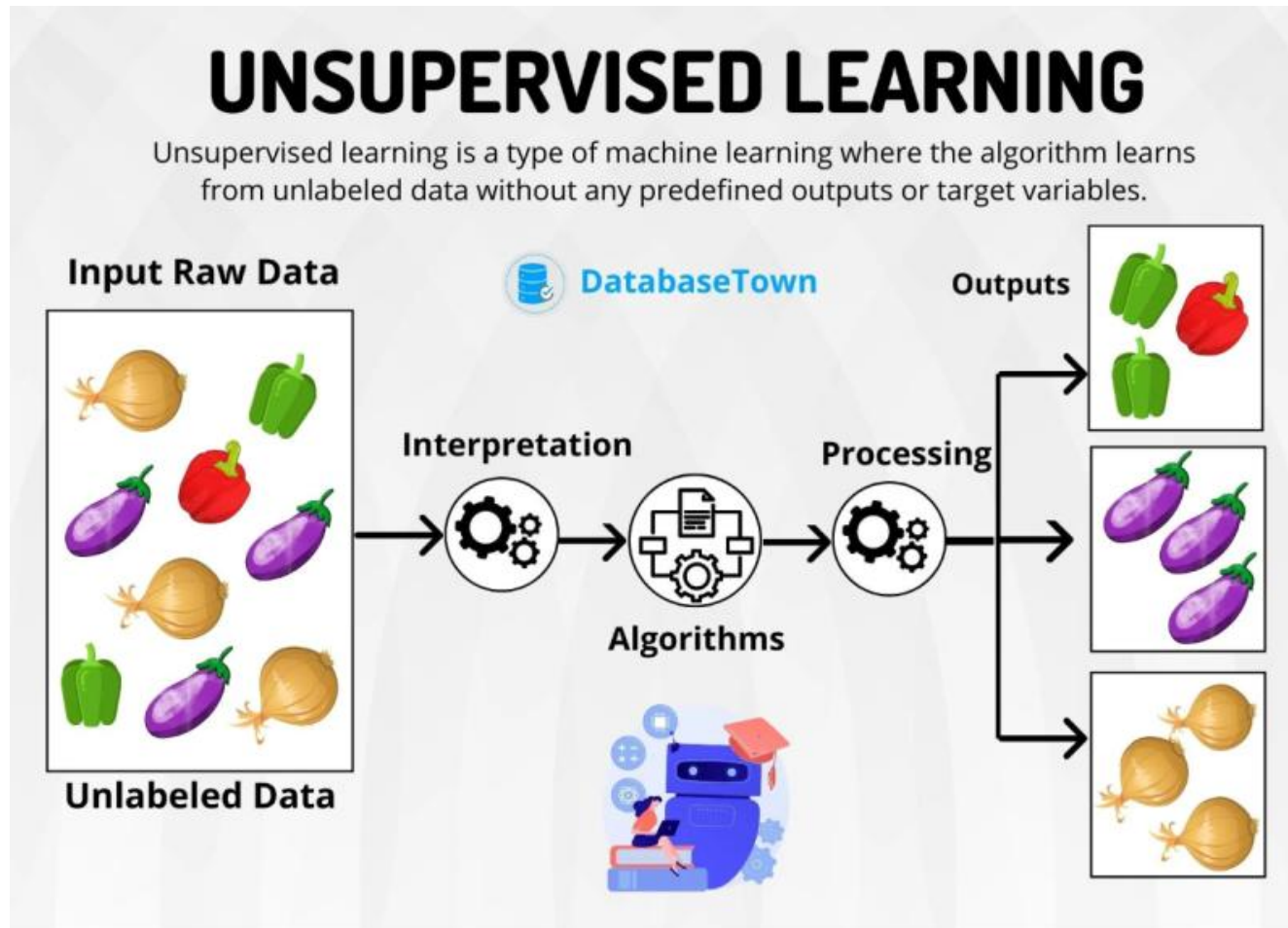
Unsupervised Learning Concepts



Unsupervised Learning methods

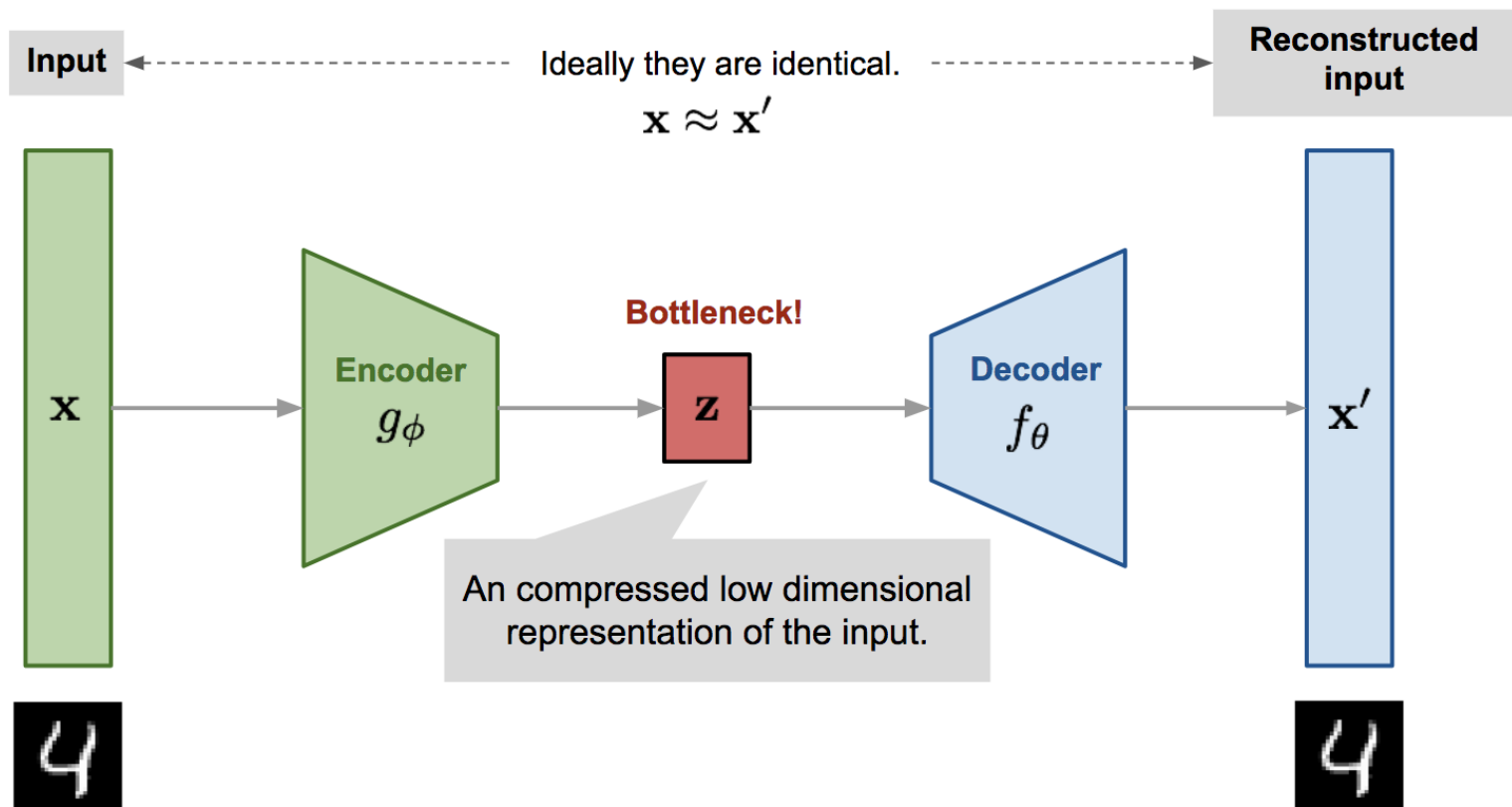
Autoencoder, Generative Models

■ Unsupervised Learning

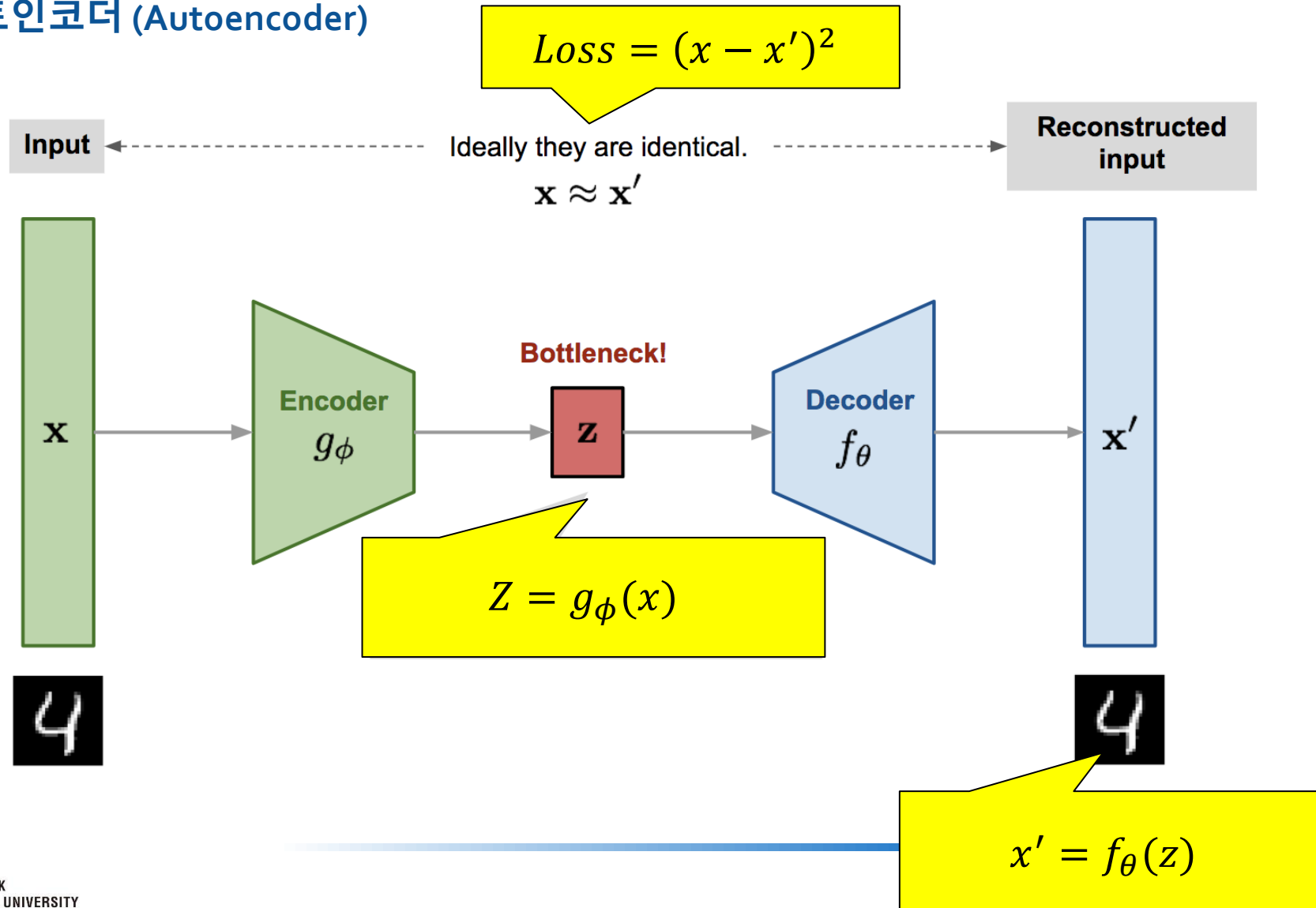


■ 오토인코더 (Autoencoder)

- 입력을 압축(Encoder) → 복원(Decoder)하는 신경망 구조
목적: 중요한 feature 추출, 차원 축소, 데이터 압축

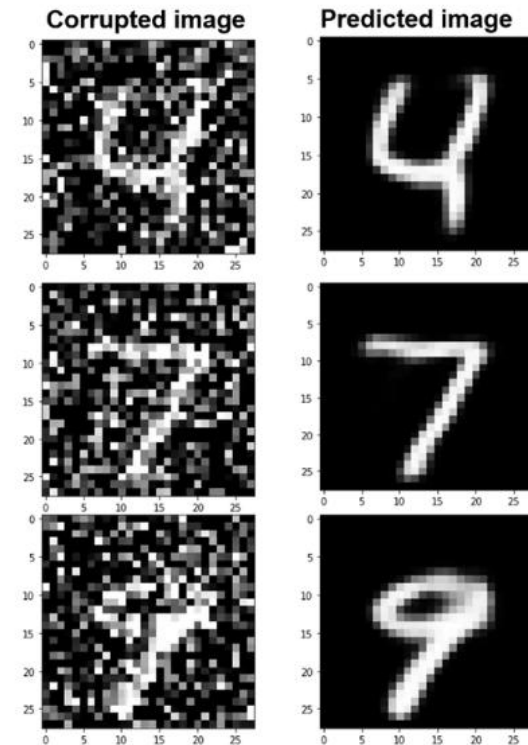
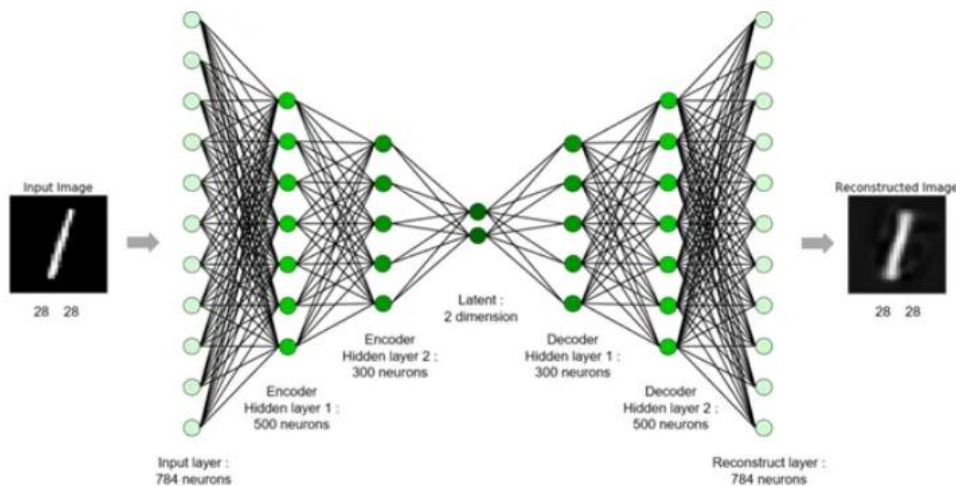


■ 오토인코더 (Autoencoder)



■ 오토인코더 (Autoencoder) 응용

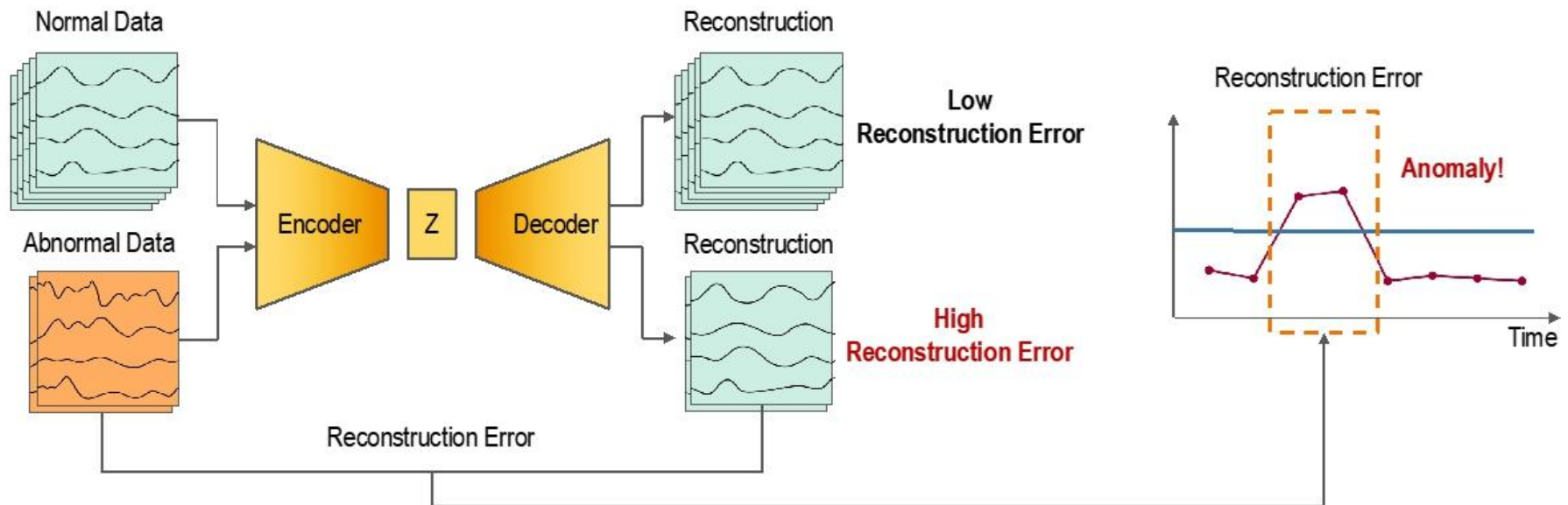
- Denoising Autoencoder : 원본 데이터에서 잡음 제거
- 학습: 입력은 잡음 부과, reconstruction은 깨끗한 데이터



■ 오토인코더 (Autoencoder) 응용

➤ 이상 감지 (Anomaly Detection)

학습: Normal Data 로만 학습 → Abnormal Data 에 대해서는 복원 어려움



■ 생성 모델 (Generative Models)

➤ 생성 모델이란?

주어진 학습 데이터를 학습하여, 학습 데이터의 분포를 따르는 유사한 데이터를 생성하는 모델

VAE
Variational Autoencoder

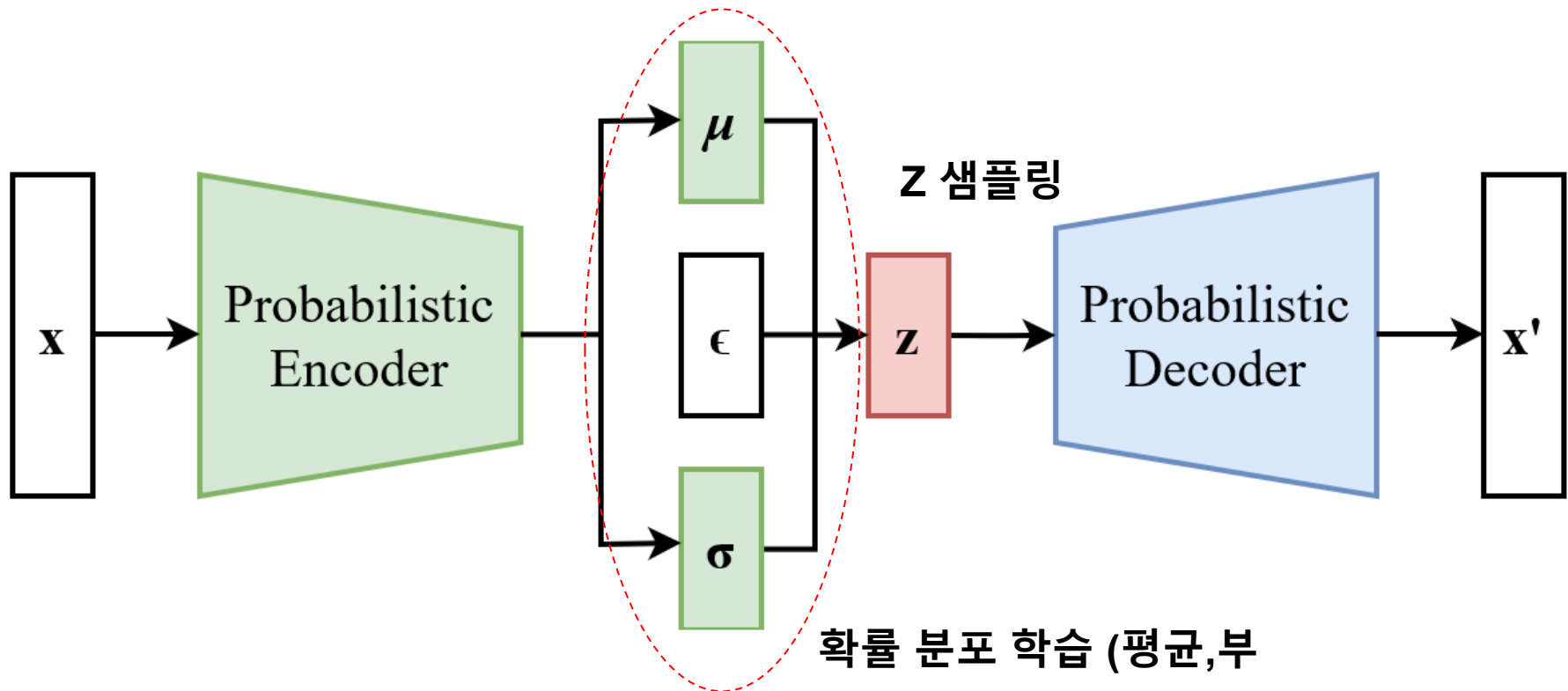
GAN
**Generative
Adversarial Network**

Diffusion Model

■ 생성 모델 (Generative Models)

➤ Variational Autoencoder

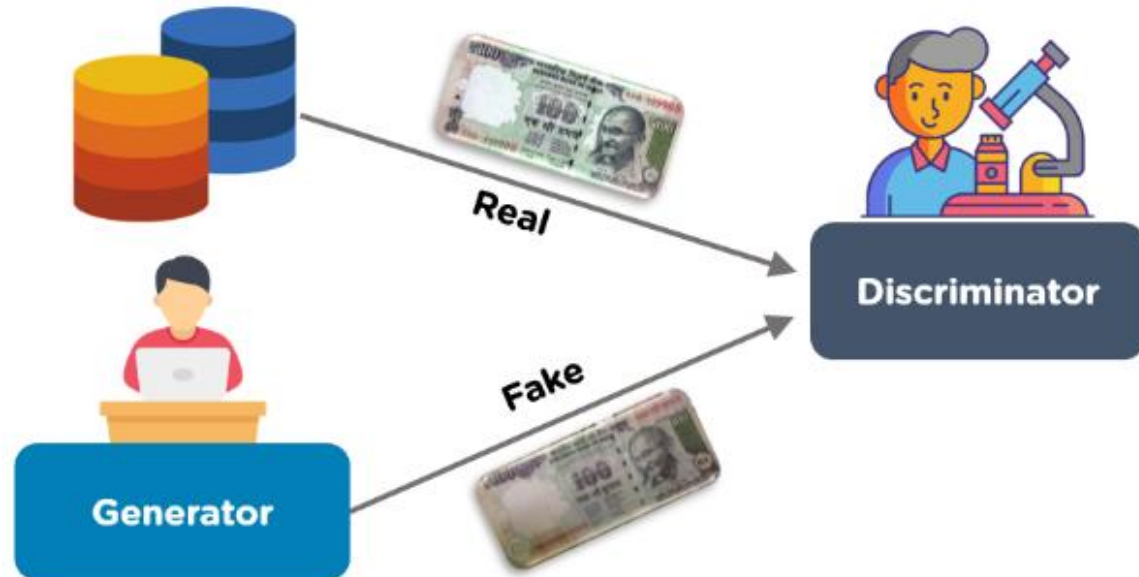
- Variational: 변동 (확률적)
- Autoencoder: 자동 인코더 (자동으로 입력 데이터를 인코딩)



■ 생성 모델 (Generative Models)

➤ Generative Adversarial Network

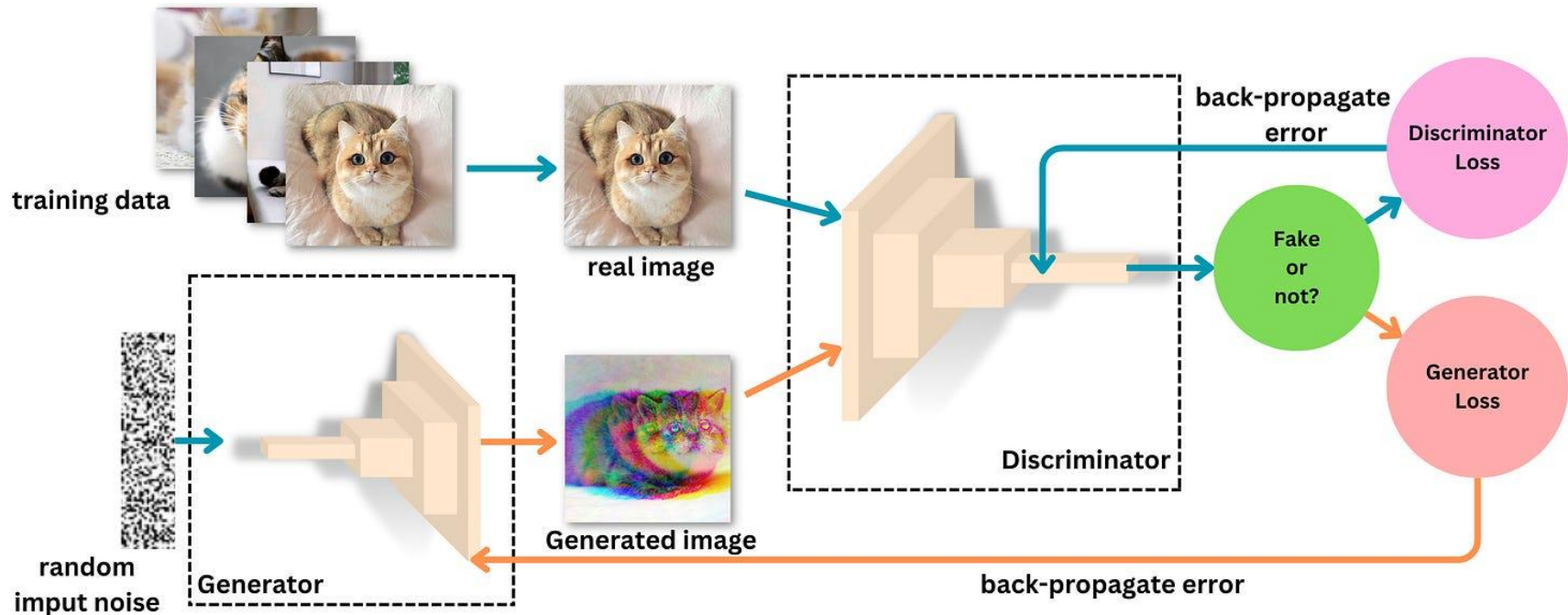
- Generative : 생성하는
- Adversarial : 적대적인
- Network : 신경망



출처: <https://www.simplilearn.com/tutorials/deep-learning-tutorial/generative-adversarial-networks-gans>

■ 생성 모델 (Generative Models)

➤ Generative Adversarial Network



출처: <https://newsletter.theaiedge.io/p/how-generative-adversarial-networks>

■ 생성 모델 (Generative Models)

➤ Diffusion Model

Forward Process : 데이터를 점진적으로 **노이즈화** → 순수 가우시안 노이즈로 만듦

Reverse Process: 학습한 모델이 노이즈를 점진적으로 제거하여 데이터를 복원



출처: <https://medium.com/augmented-startups/how-does-dall-e-2-work-e6d492a2667f>

■ 차후 수업 진행 안내

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감사합니다

Q&A

