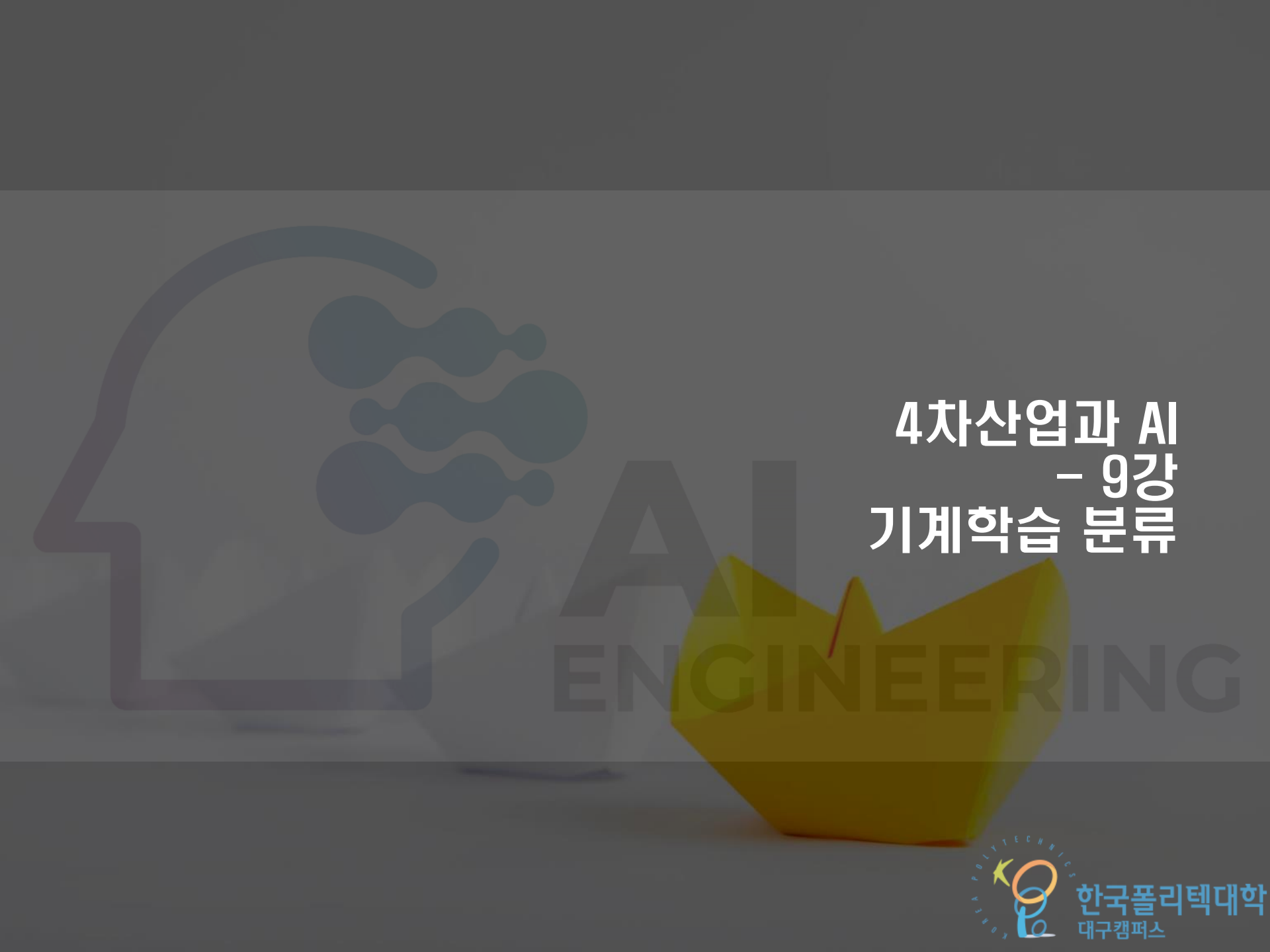
4차산업과 AI

한국폴리텍대학 대구캠퍼스
AI엔지니어링과 강현우



4차산업과 AI
– 9강
기계학습 분류

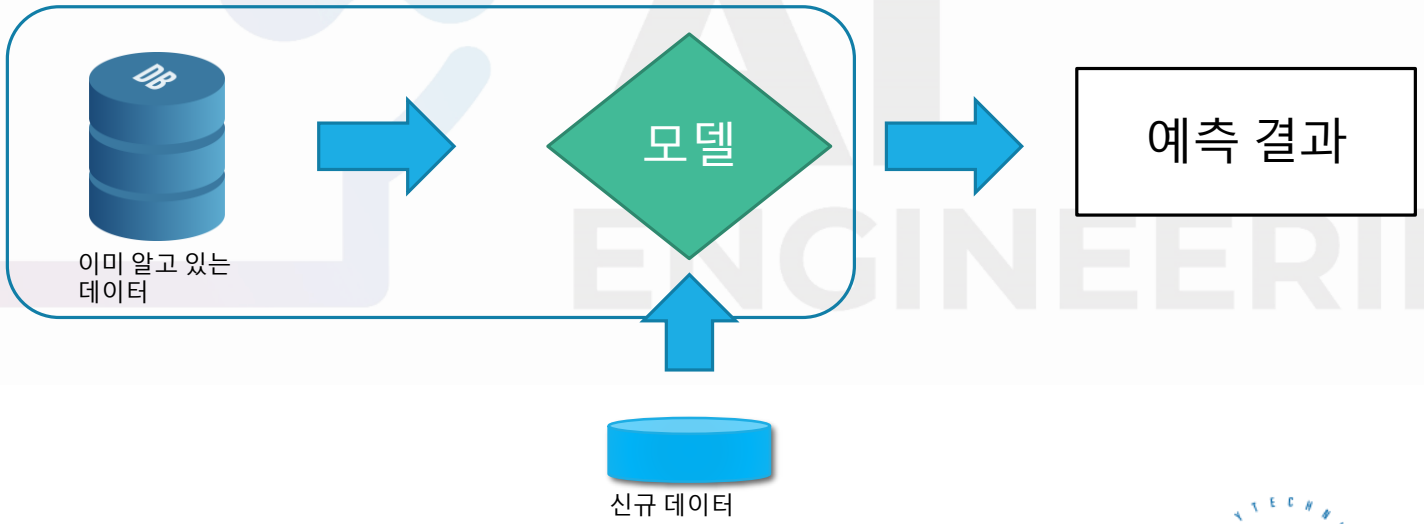
한국폴리텍대학
대구캠퍼스

지난 시간 복습

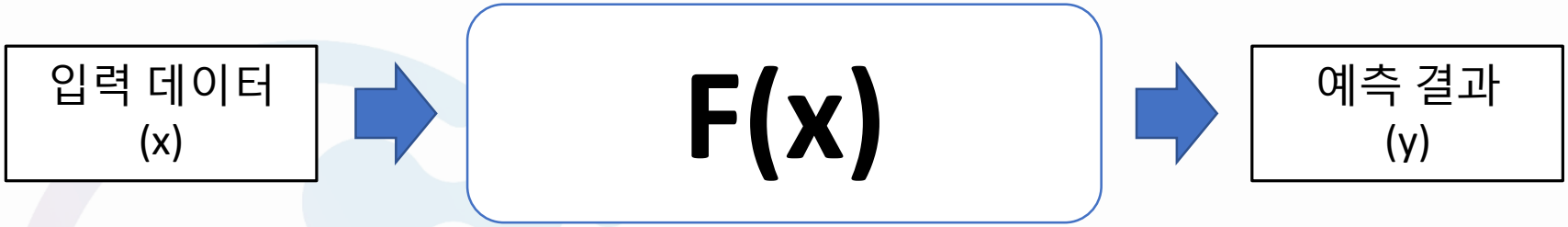
◆ Machine Learning

➢ 이미 알고 있는 데이터 (학습 데이터)로 모델을 생성해내는 과정

✓데이터에서 패턴을 추출하여 스스로 지식을 획득



지난 시간 복습



- 과거에는 F(x) 를 만드는데 집중
- 머신 러닝은 알고있는 데이터 x와 결과 y로 F(x) 를 만들어 내는 것

F(x) 어디까지?

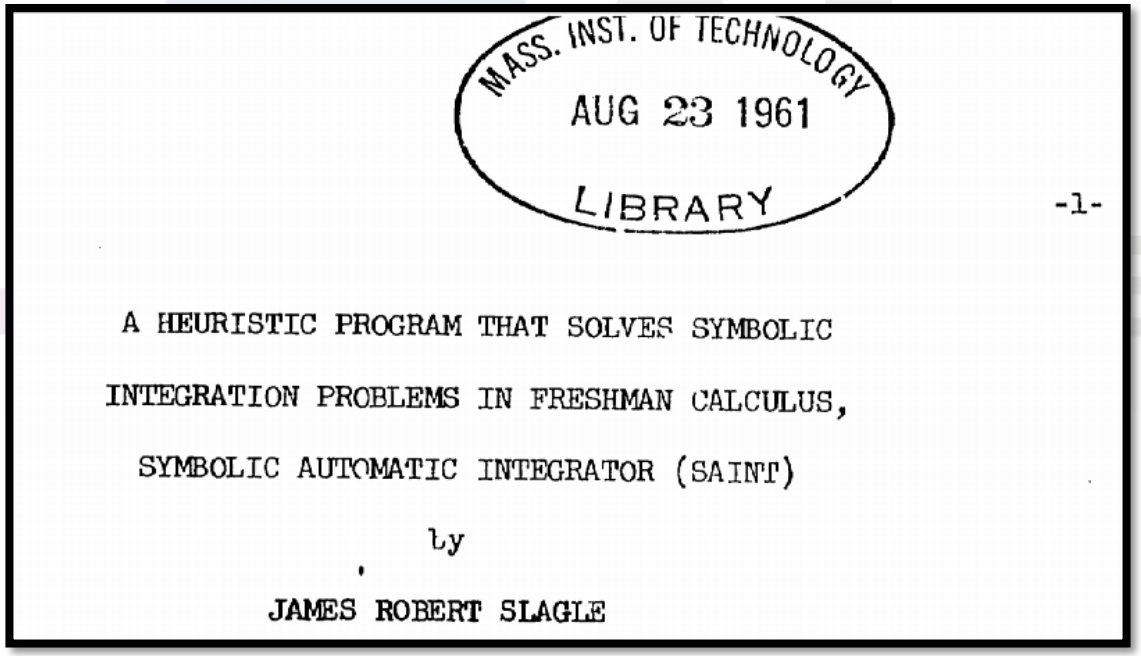
- 다음 적분 문제를 풀어봅시다

$$\int \frac{x^4}{(1-x^2)^{5/2}} dx$$

- 만약 컴퓨터가 이 문제를 푼다면?

Saint

- “A heuristic program that solves symbolic integration problems in freshman calculus, **s**ymbolic **a**utomatic **int**egrator (Saint)



MASS. INST. OF TECHNOLOGY
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LIBRARY

-1-

A HEURISTIC PROGRAM THAT SOLVES SYMBOLIC

INTEGRATION PROBLEMS IN FRESHMAN CALCULUS,

SYMBOLIC AUTOMATIC INTEGRATOR (SAINT)

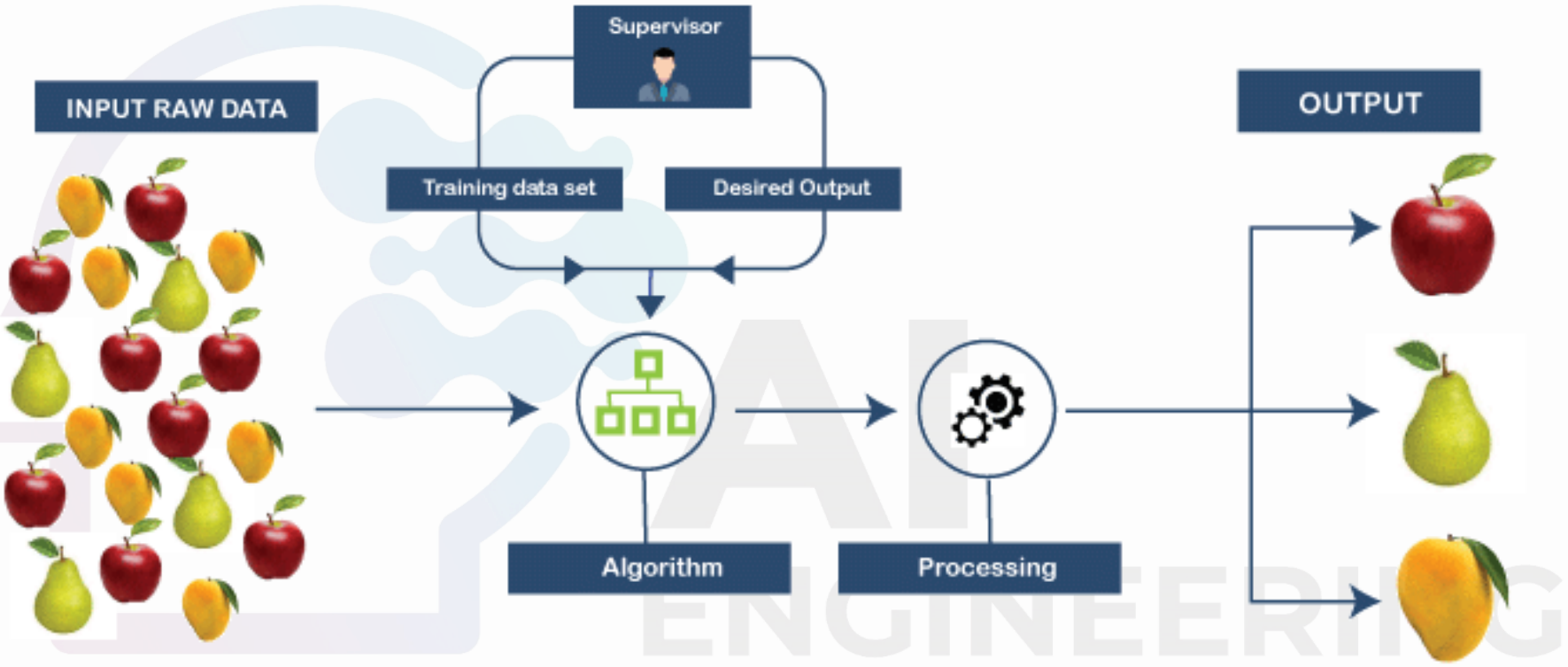
by

JAMES ROBERT SLAGLE

머신 러닝 학습 방법

- 지도 학습 (Supervised Learning)
- 비지도 학습 (Unsupervised Learning)
- 준지도 학습 (Semi-supervised Learning)
- 강화 학습 (Reinforcement Learning)

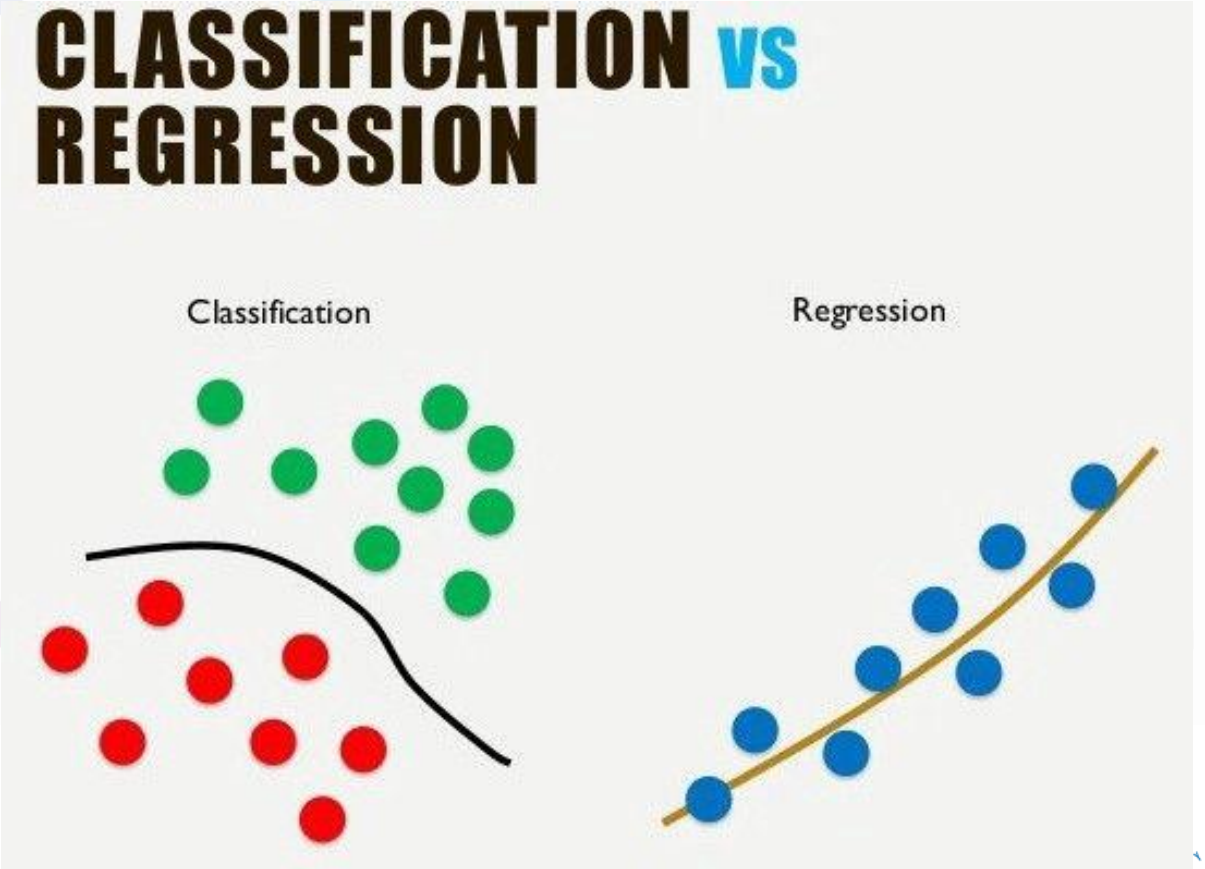
지도 학습



[출처] https://www.tutorialandexample.com/supervised-machine-learning/

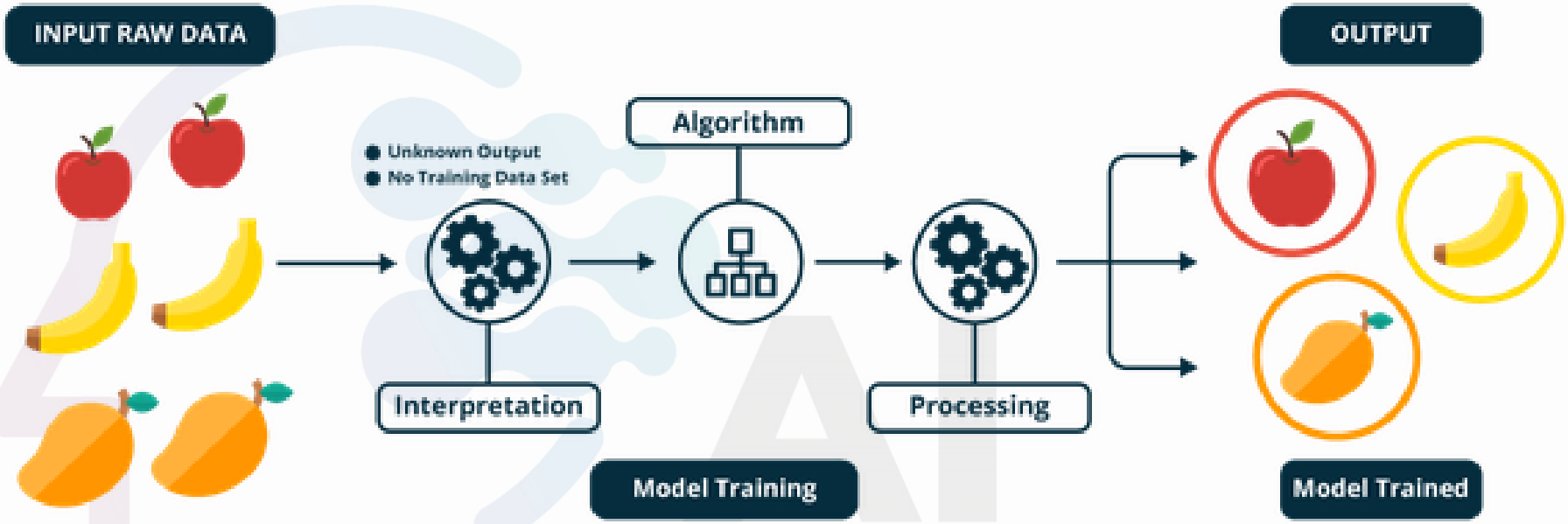
지도 학습

◆ Classification vs Regression



[출처] https://www.pinterest.co.kr/pin/729231364647517568/

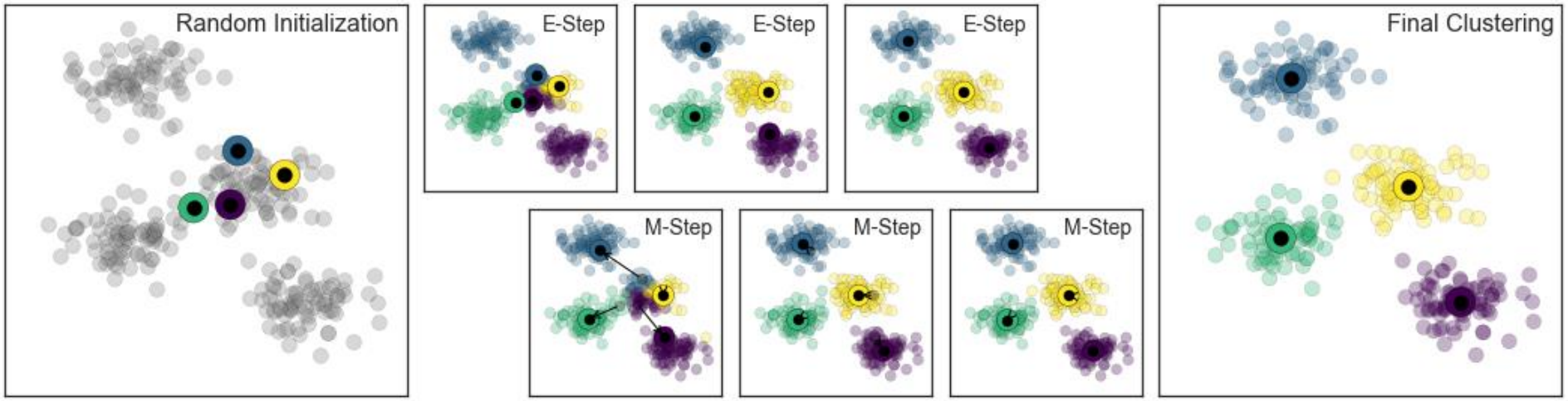
비지도 학습



[출처] https://www.blendspace.com/lessons/mfiu9IDljkeE7A/it605d-l20-unsupervised-learning-winners-take-all

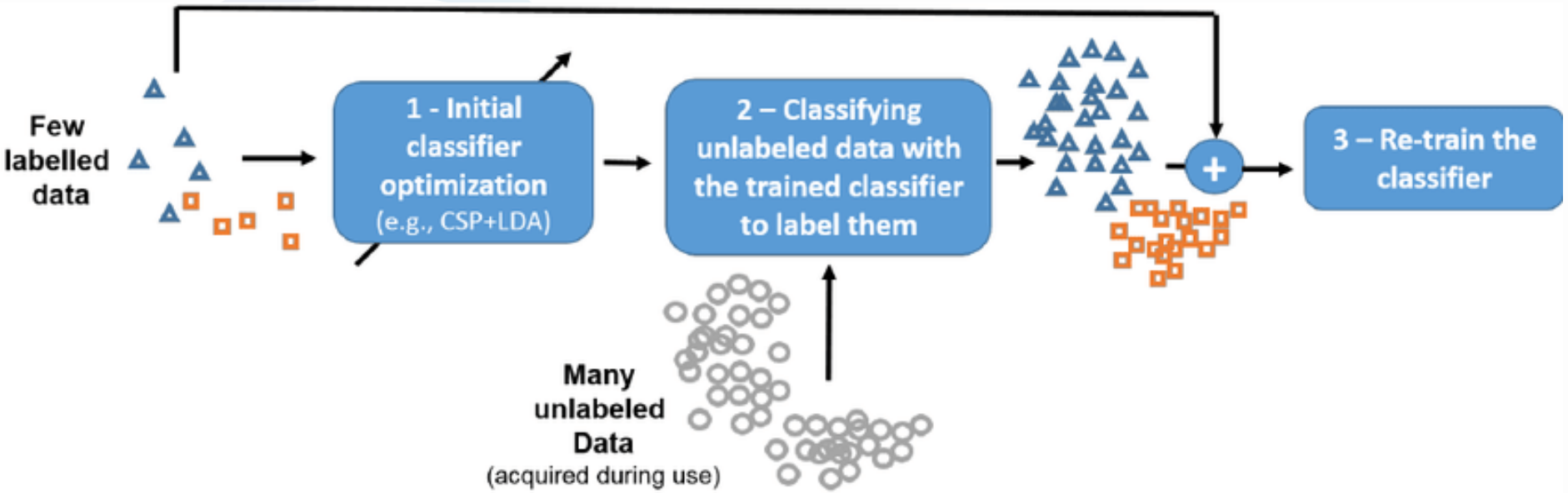
비지도 학습

◆ 군집화 (Clustering)



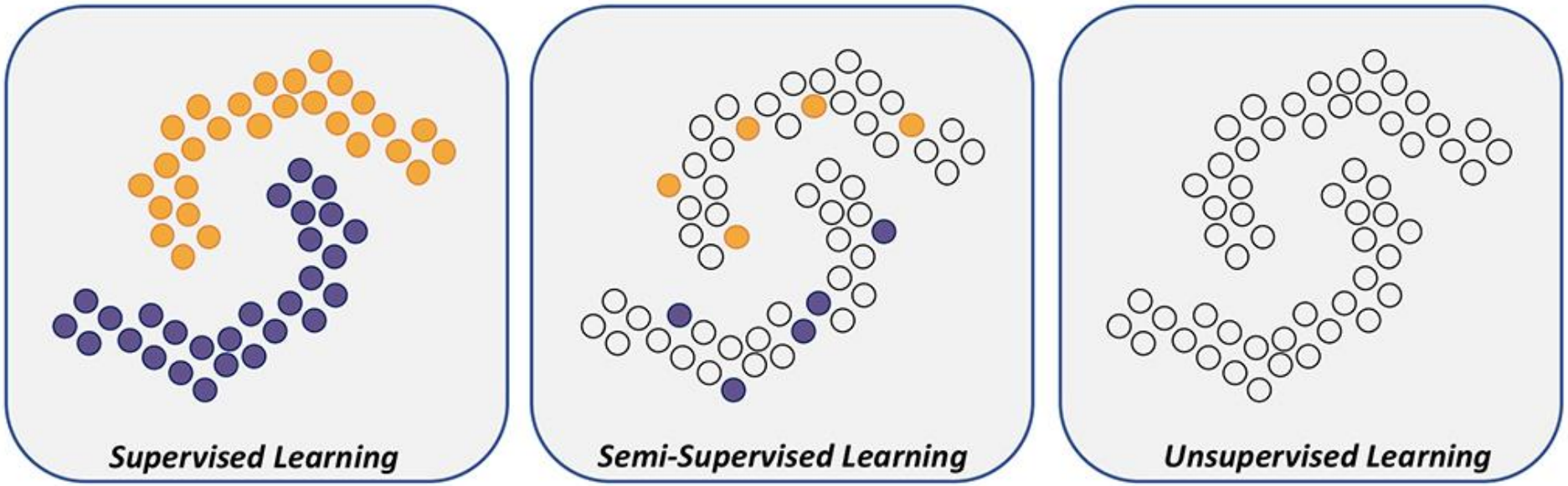
[출처] https://jakevdp.github.io/PythonDataScienceHandbook/05.11-k-means.html

준지도 학습



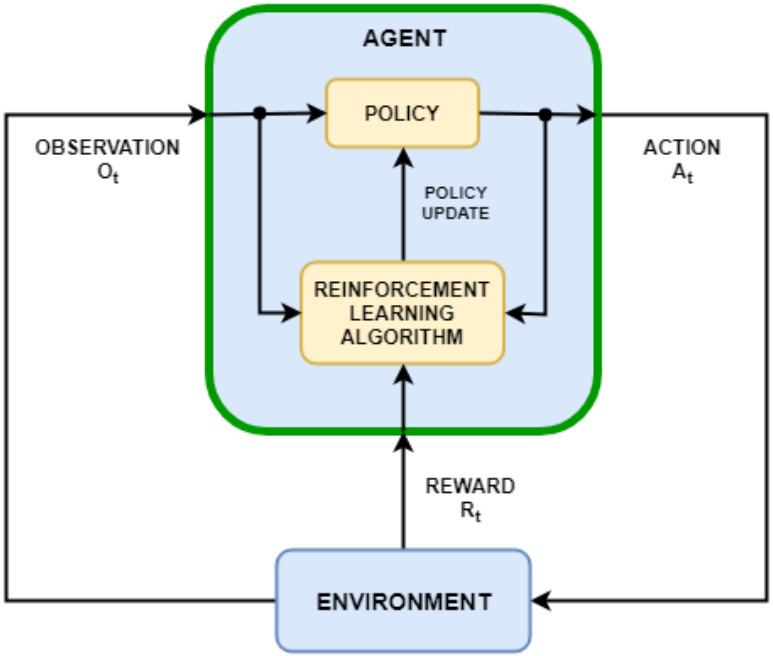
[출처] https://www.researchgate.net/figure/Principle-of-semi-supervised-learning-1-a-model-eg-CSP-LDA-classifier-is-first_fig4_277605013

지도, 준지도, 비지도 학습

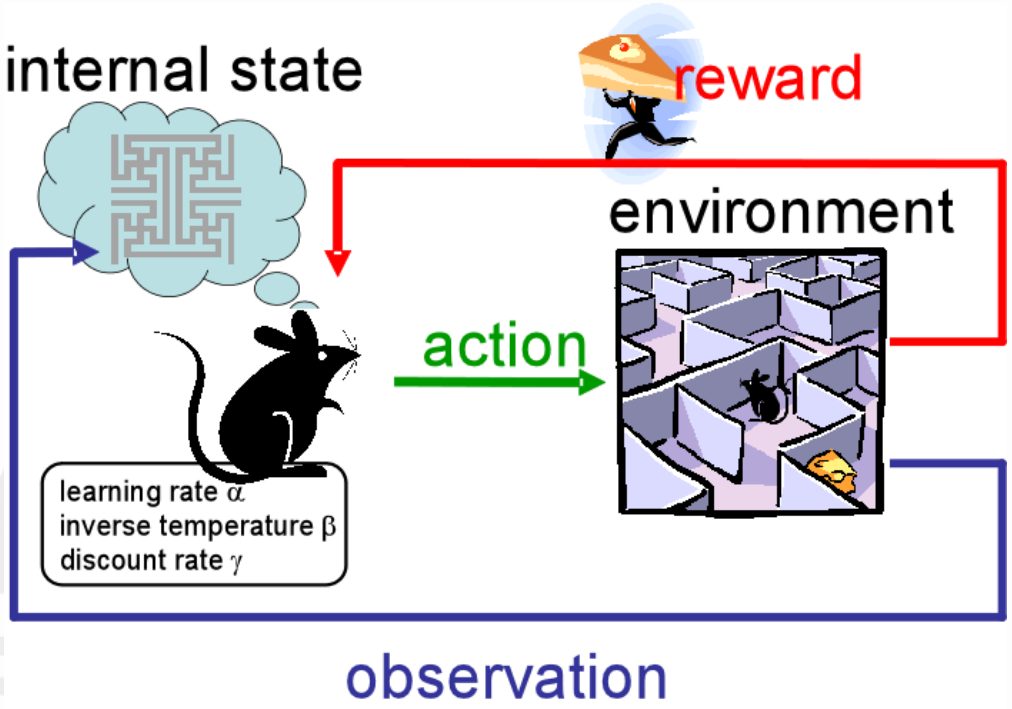


[출처] https://blog.est.ai/2020/11/ssl/

강화 학습



[출처] https://kr.mathworks.com/help/reinforcement-learning/ug/create-agents-for-reinforcement-learning.html



[출처] https://becominghuman.ai/the-very-basics-of-reinforcement-learning-154f28a79071

Deep Learning의 첫 성과

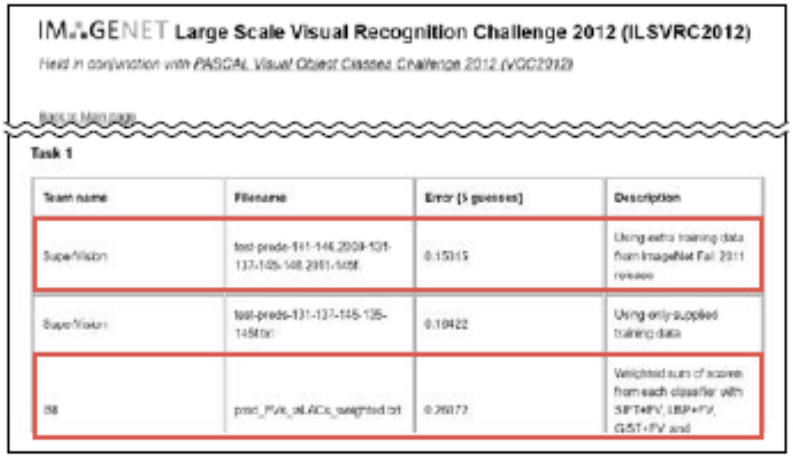
◆2010년 이후

- ➢ 신경망 기반의 머신러닝 이미지 인식!
- ➢ ILSVRC 2012 – ImageNet
- ➢ IMAGENET Large Scale Visual Recognition Challenge 2012

그림 1-13 ILSVRC 2012 – 이미지 인식 프로그램 성능 평가 순위[18]

토론토 대학 팀

도쿄 대학 팀

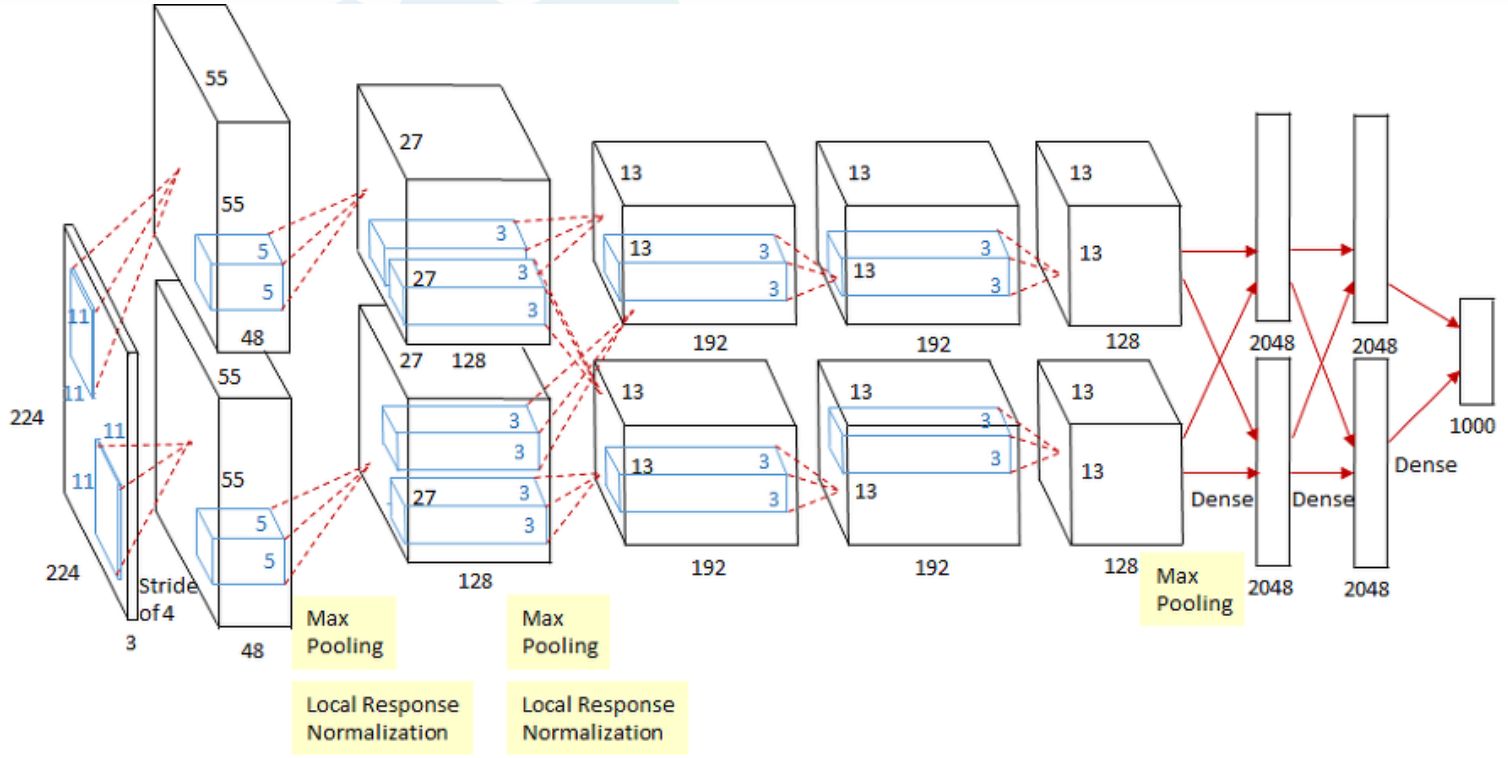


[출처] 처음 배우는 인공지능

ImageNet 우승

◆AlexNet

- ➢Alex Krizhevsky, ILSVRC 2012
- ➢CNN (Convolutional Neural Net)



Deep Learning 발전의 공로자들

- ImageNet
  - http://www.image-net.org/challenges/LSVRC/
- Turing Award 2018
  - https://awards.acm.org/about/2018-turing

Yoshua Bengio

Geoffrey Hinton

Yann LeCun

Summary

◆ 기계 학습이란?

- ➢ 데이터를 이용하여 일반화된 모델을 만드는 것
- ➢ 데이터, 알고리즘이 필요

◆ 기계학습의 방법

- ➢ 지도 학습 (supervised learning)
- ➢ 비지도 학습 (unsupervised learning)
- ➢ 준지도 학습 (semi supervised learning)
- ➢ 강화학습 (reinforcement learning)