

딥러닝 몸풀기

누구나 이해할 수 있는 딥러닝

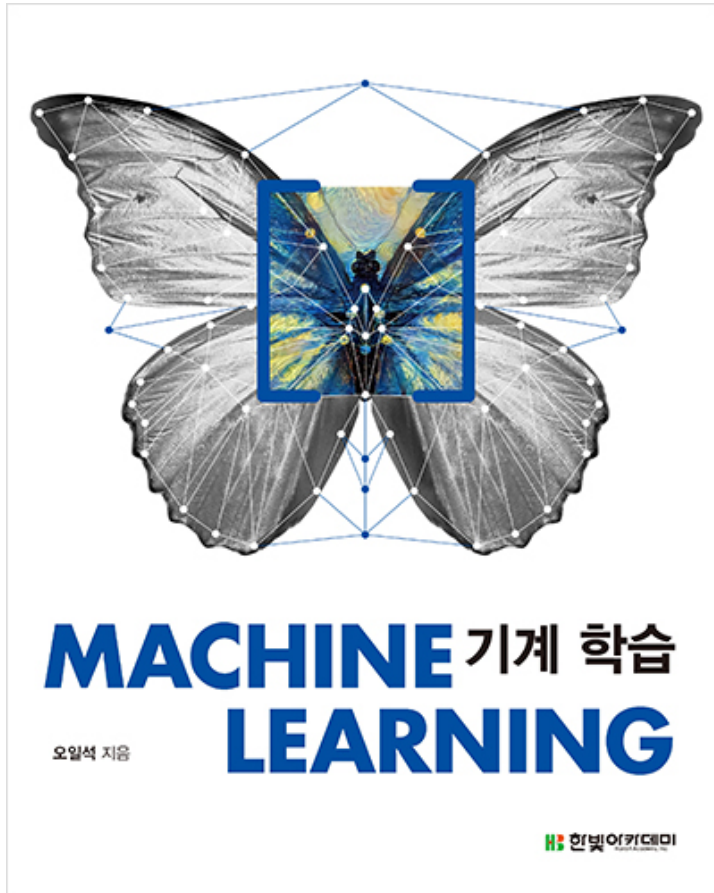
Local Laboratory

딥러닝 몸풀기

Local Laboratory

1. **인공지능과 기계학습 그리고 딥러닝**
2. 다층 퍼셉트론
3. 딥러닝의 기초

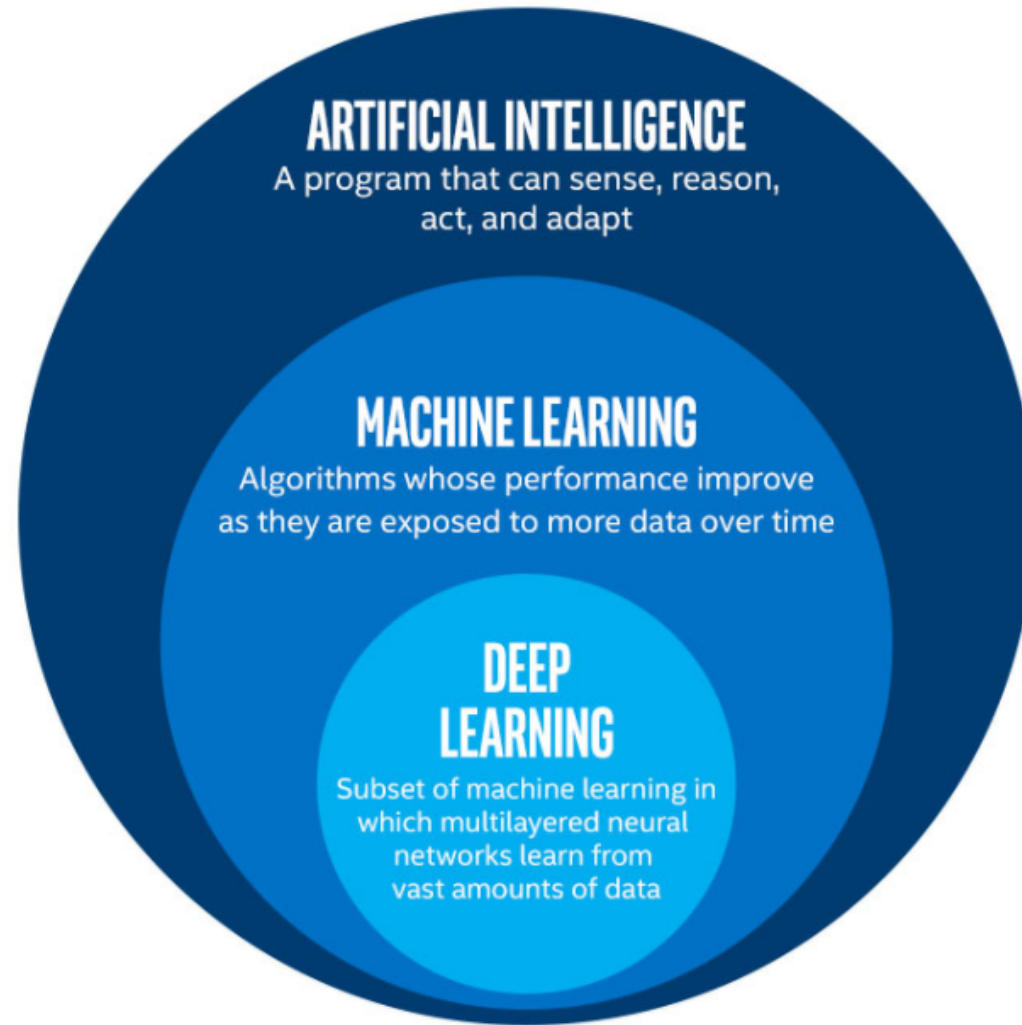
Reference



기계학습, 오일석

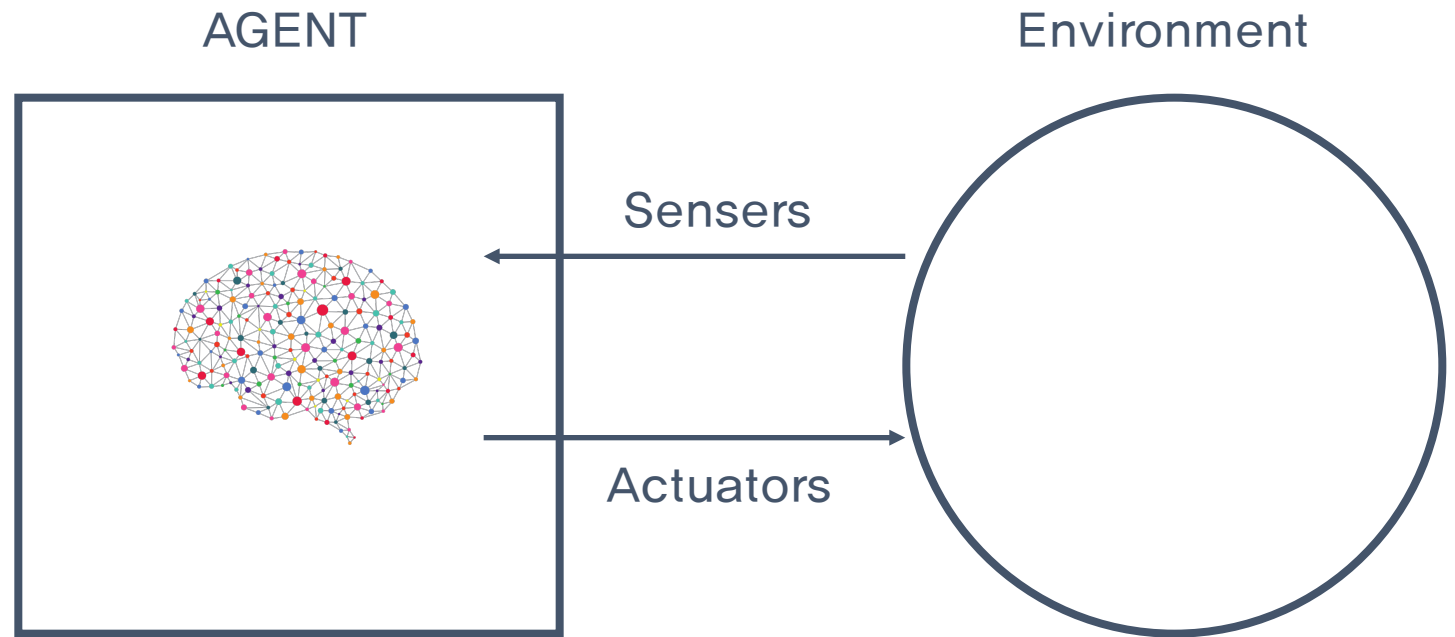


Self-Driving Car Nano degree, Udacity

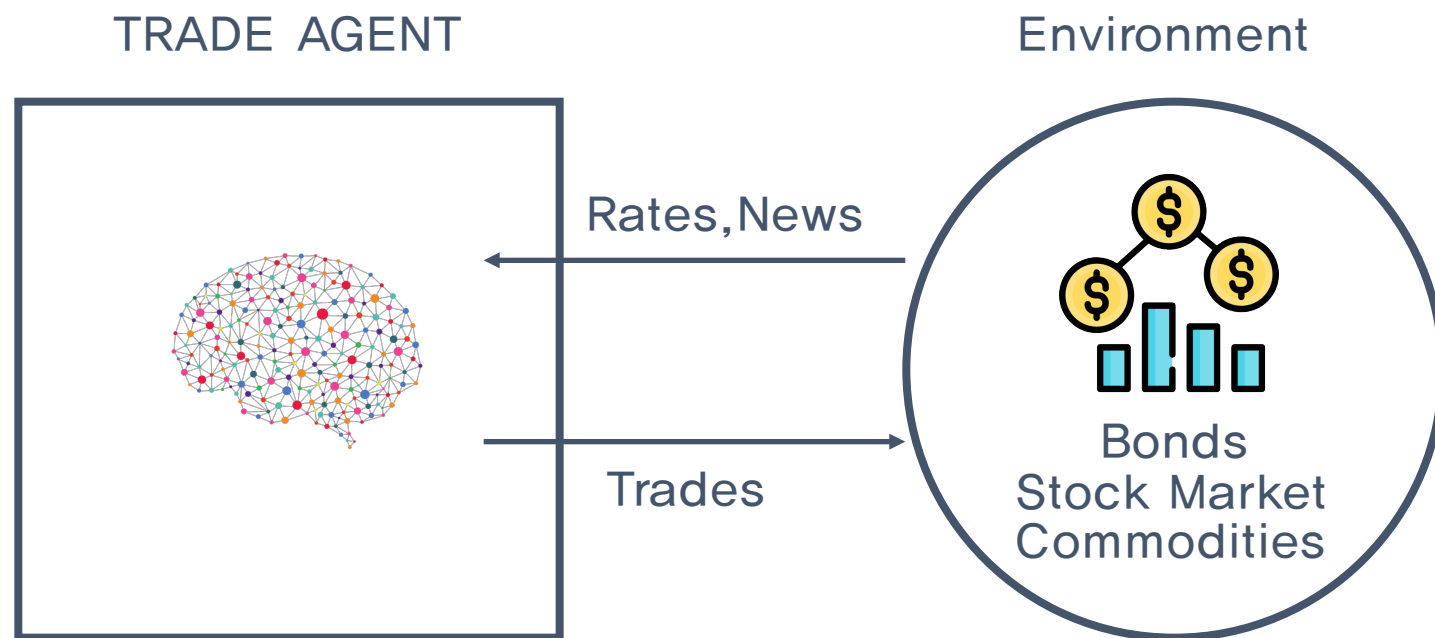


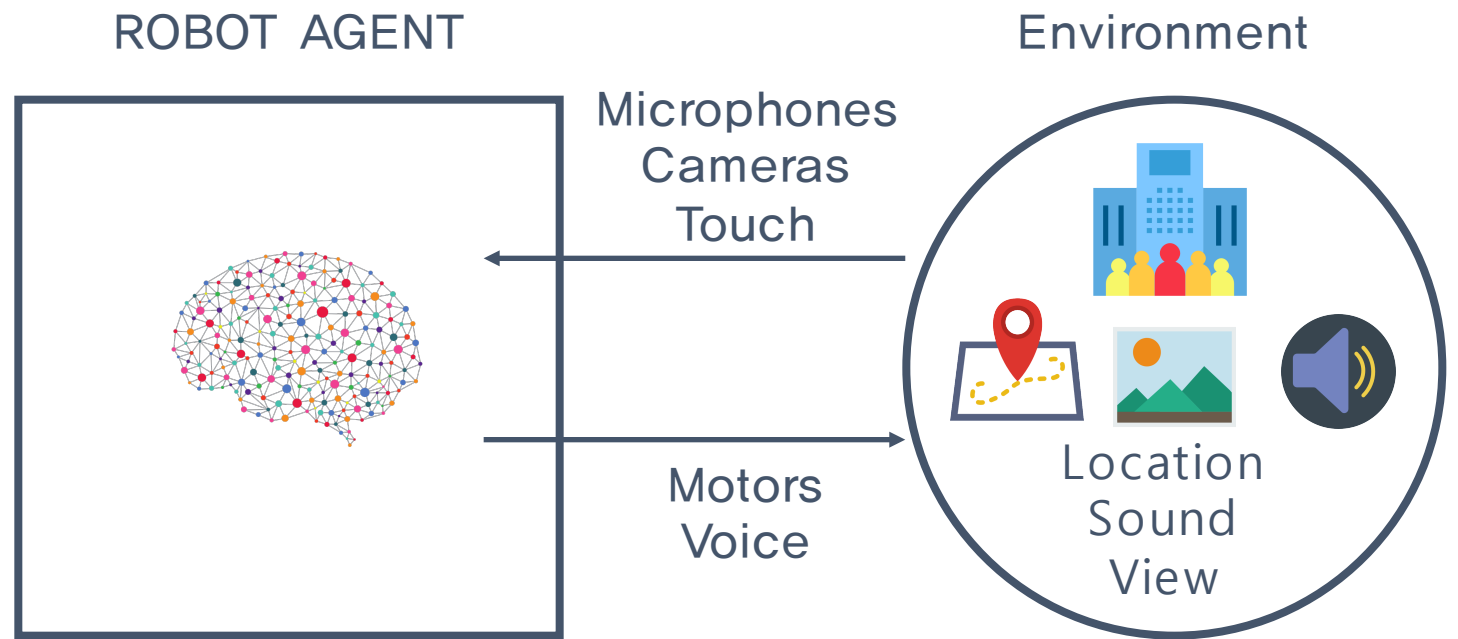
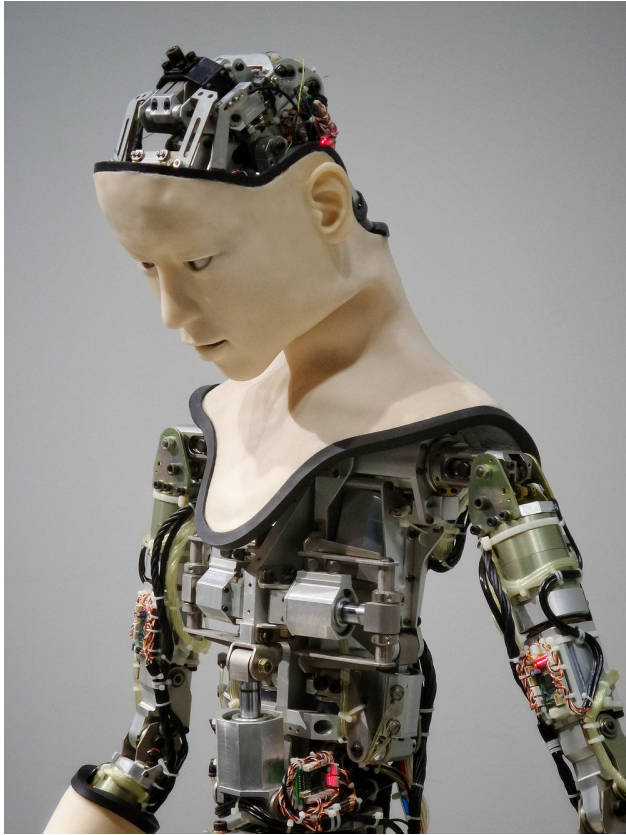


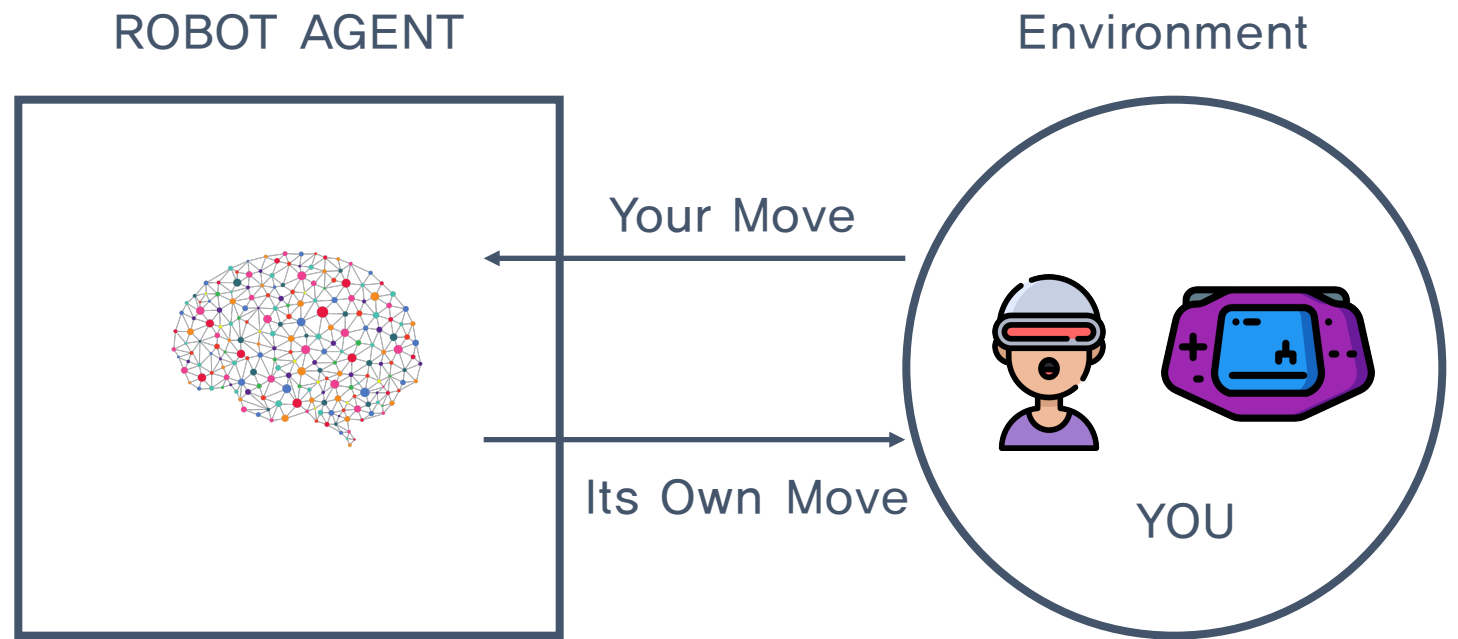
- Finance
- Robotics
- Games
- Medicine
- Web
- Etc.



에이전트는 특정 목적에 대해 사용자를 대신하여 작업을 수행하는 자율적 프로세스 (autonomous process)



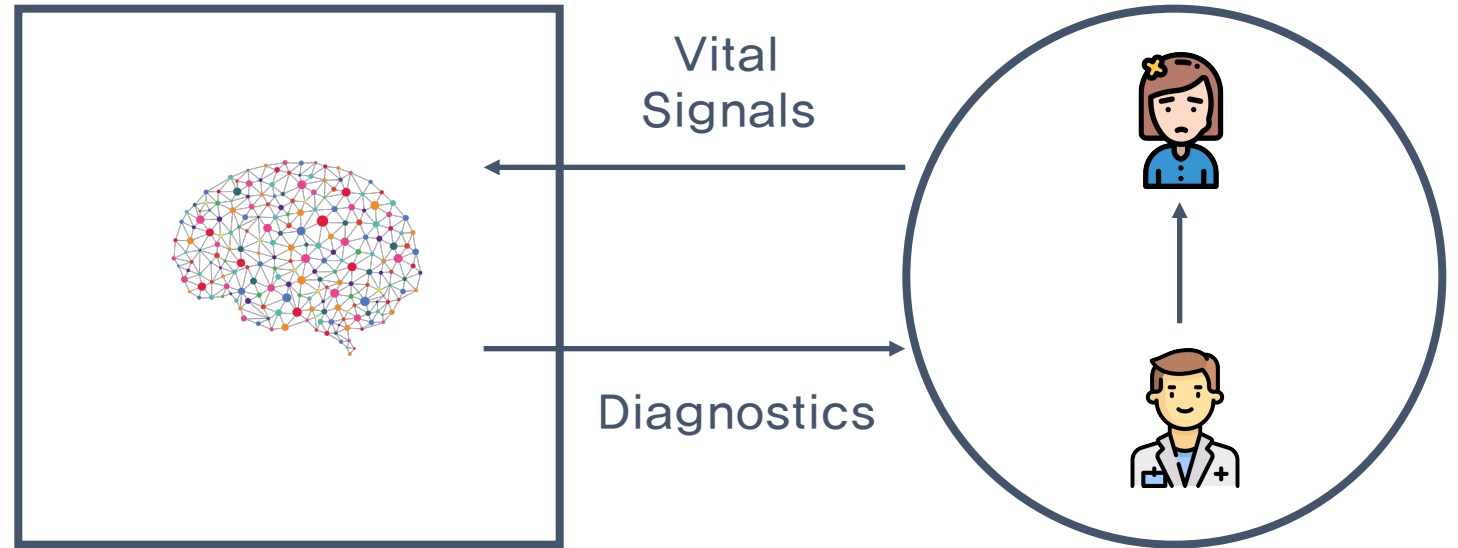


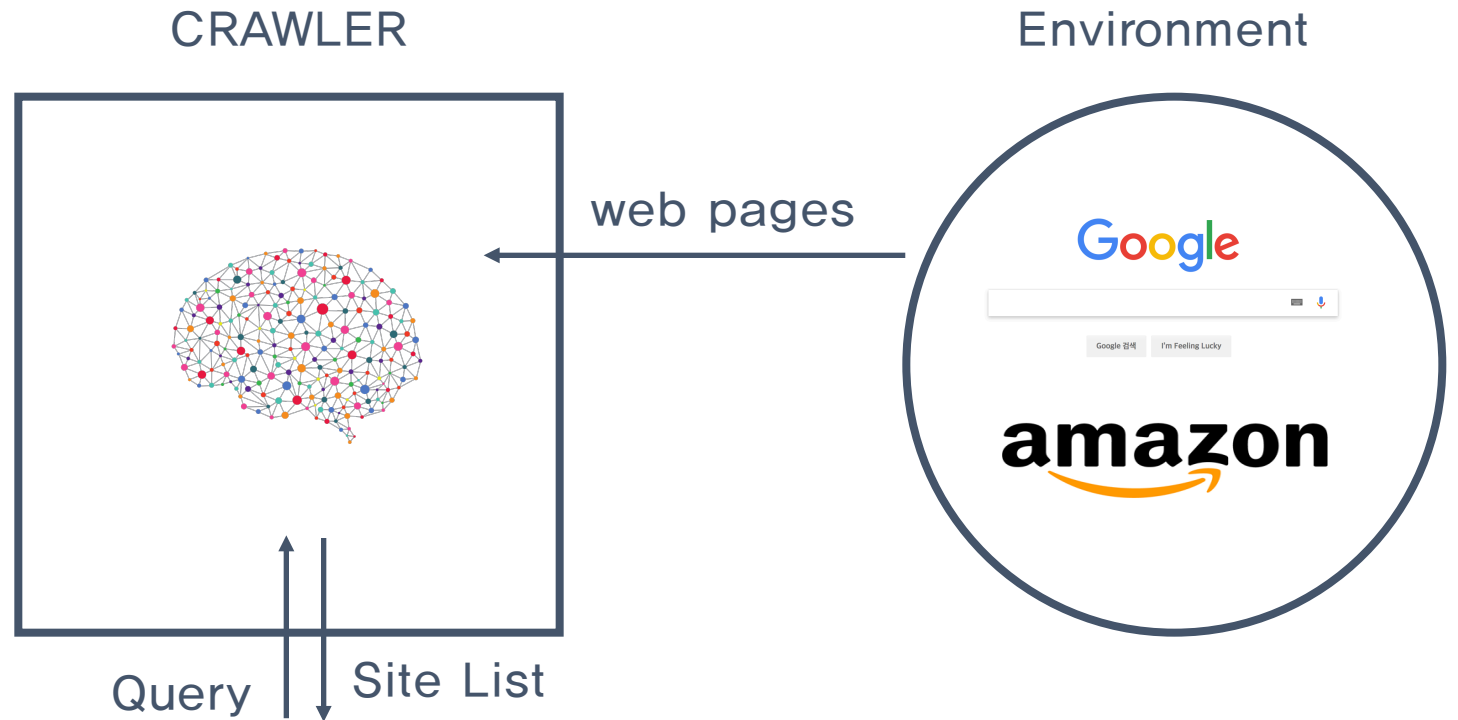


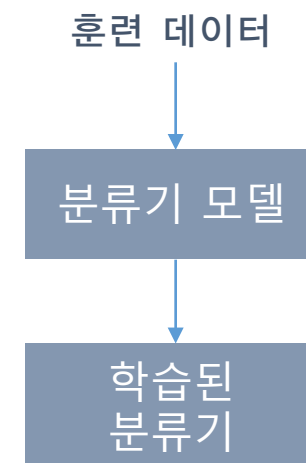
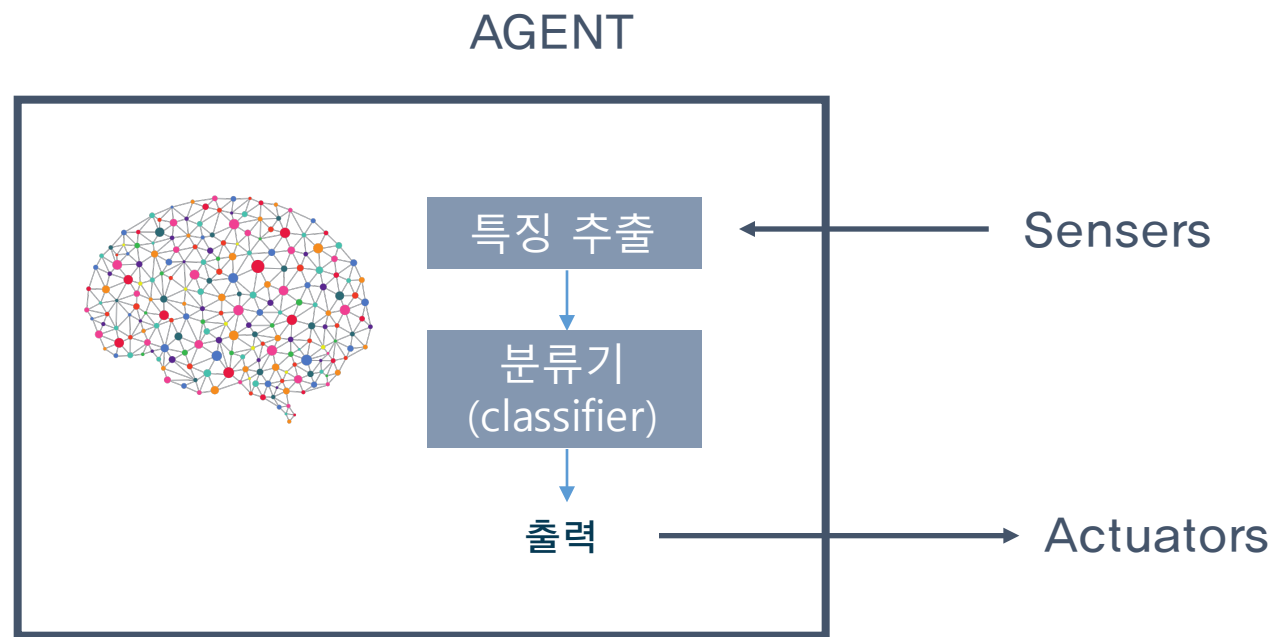


DIAGNOSTIC AGENT

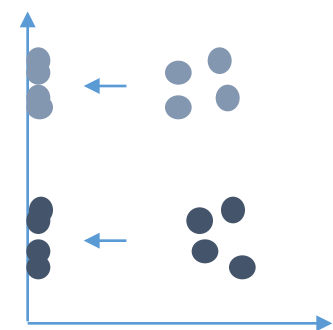
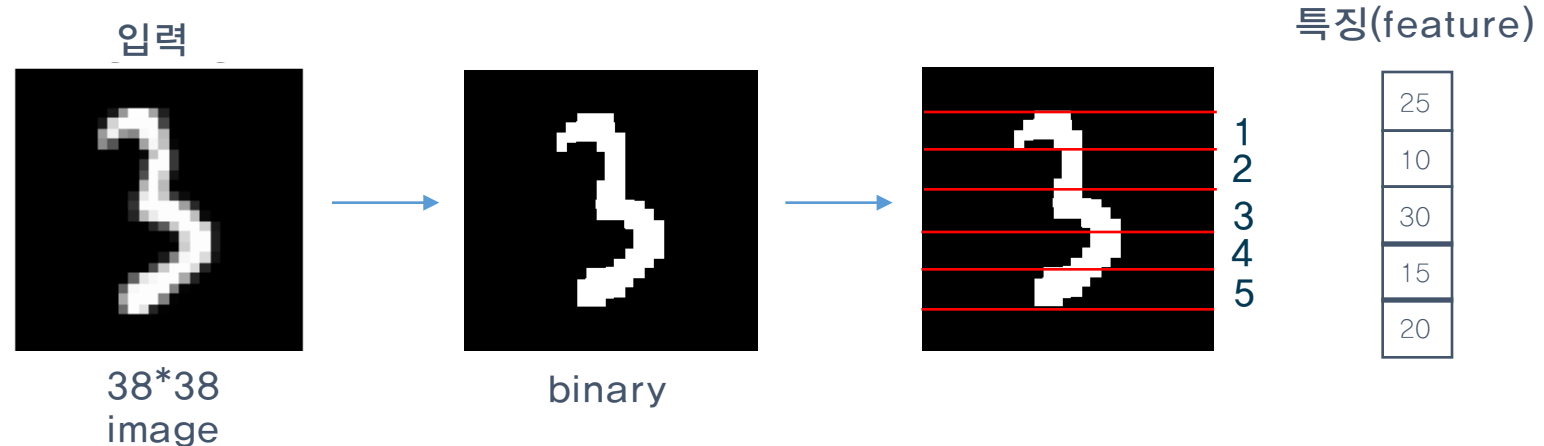
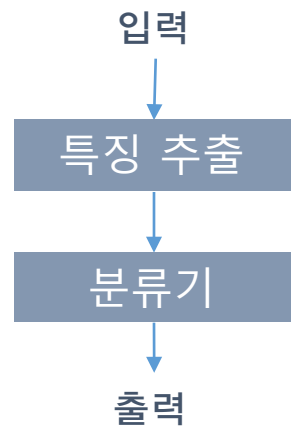
Environment



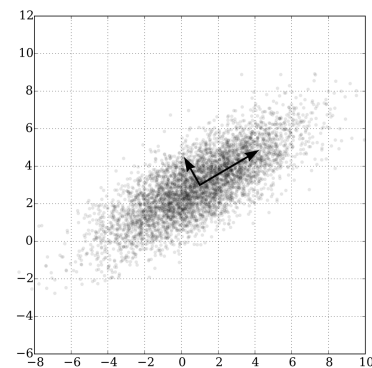




학습과정



차원 축소
dimension reduction



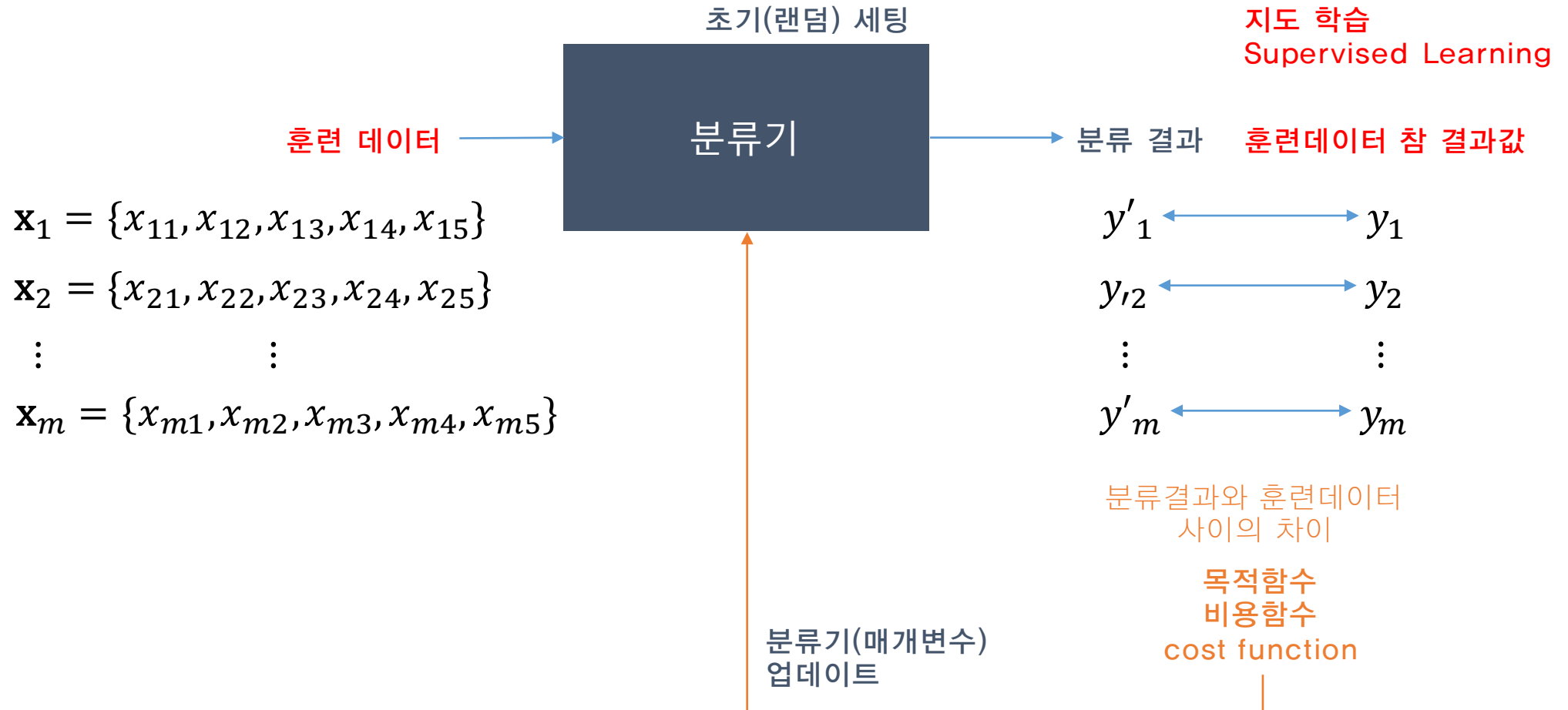
PCA
Principle Component Analysis

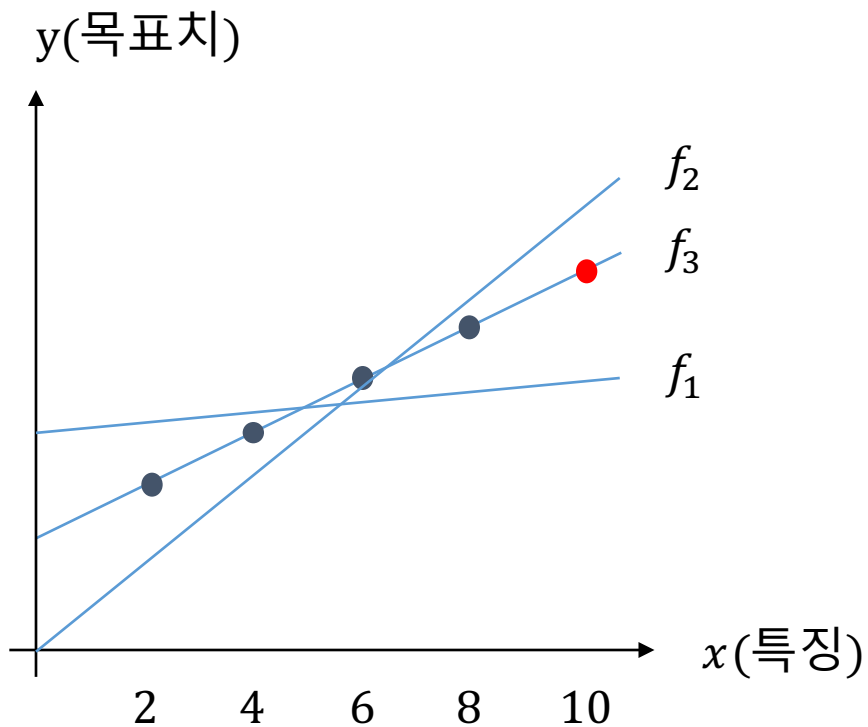
특징(feature)

30	x_1
10	x_2
30	x_3
15	x_4
20	x_5

$$\mathbf{x} = (x_1, x_2, x_3, x_4, x_5)^T = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \end{bmatrix}$$

Machine Learning = Learn models from data





분류기 모델 : 직선 모델

$$f_{\Theta}(x) = wx + b$$

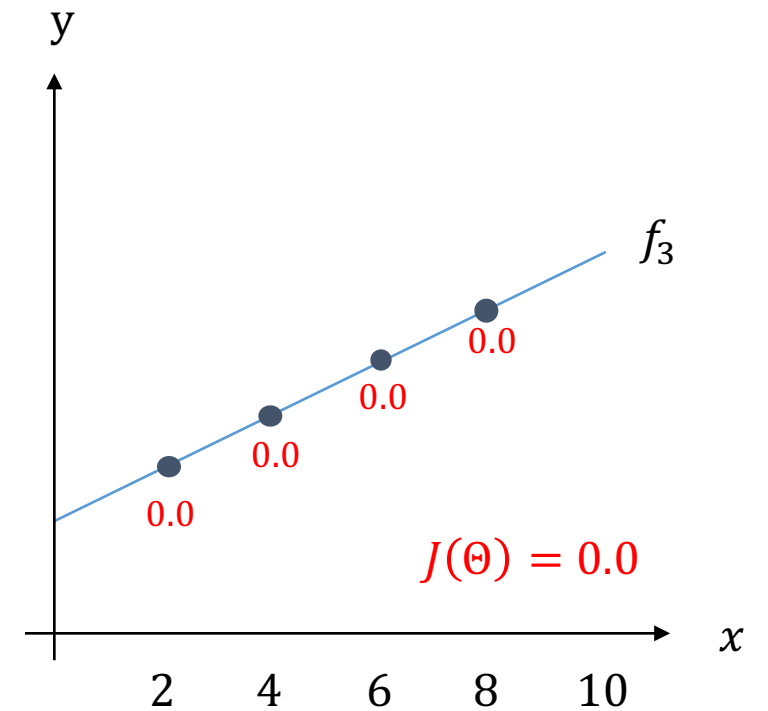
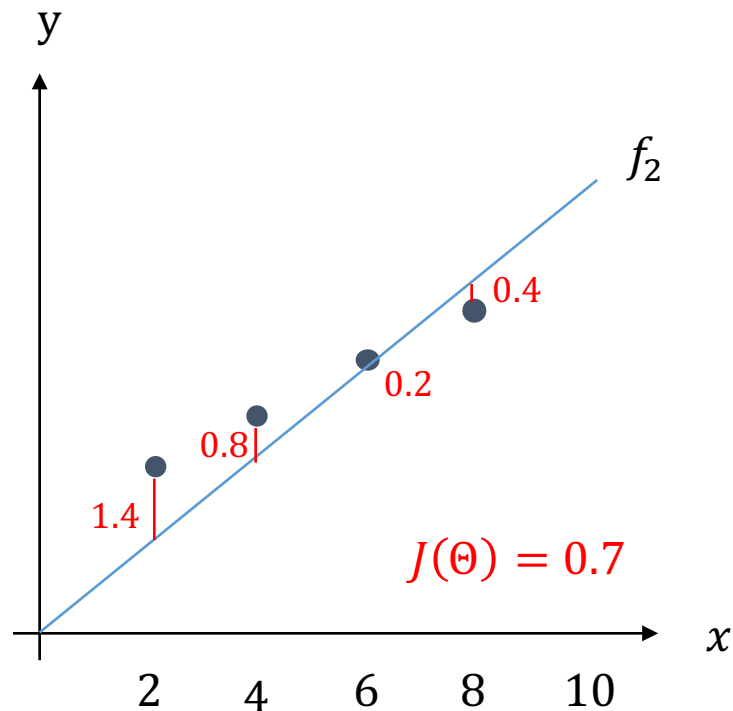
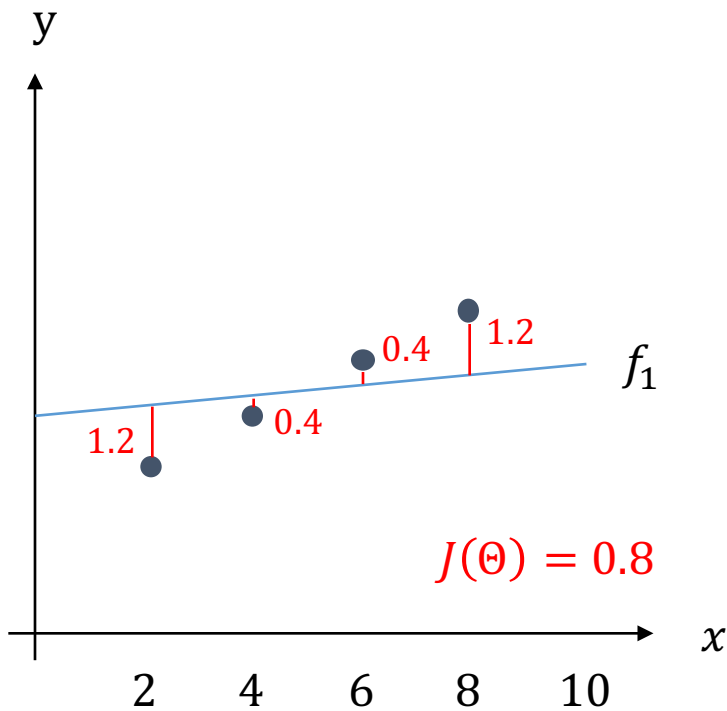
추정해야할 매개변수

$$\Theta = (w, b)^T$$

목적 함수 : 평균 제곱 오차

$$J(\Theta) = \frac{1}{n} \sum_{i=1}^n (f_{\Theta}(X_i) - y_i)^2$$

파라미터 변화에 따른 목적함수 값 변화 목적함수 $J(\Theta) = \frac{1}{n} \sum_{i=1}^n (f_{\Theta}(X_i) - y_i)^2$



난수를 생성하여 초기해 Θ_1 설정

$t = 1$

while ($J(\Theta_t)$ 가 0.0에 충분히 가깝지 않음)

$J(\Theta_t)$ 가 작아지는 방향 $\Delta\Theta_t$ 를 구한다.

$$\Theta_{t+1} = \Theta_t + \Delta\Theta_t$$

$t = t + 1$

$$\hat{\Theta} = \Theta_t$$

Price of House



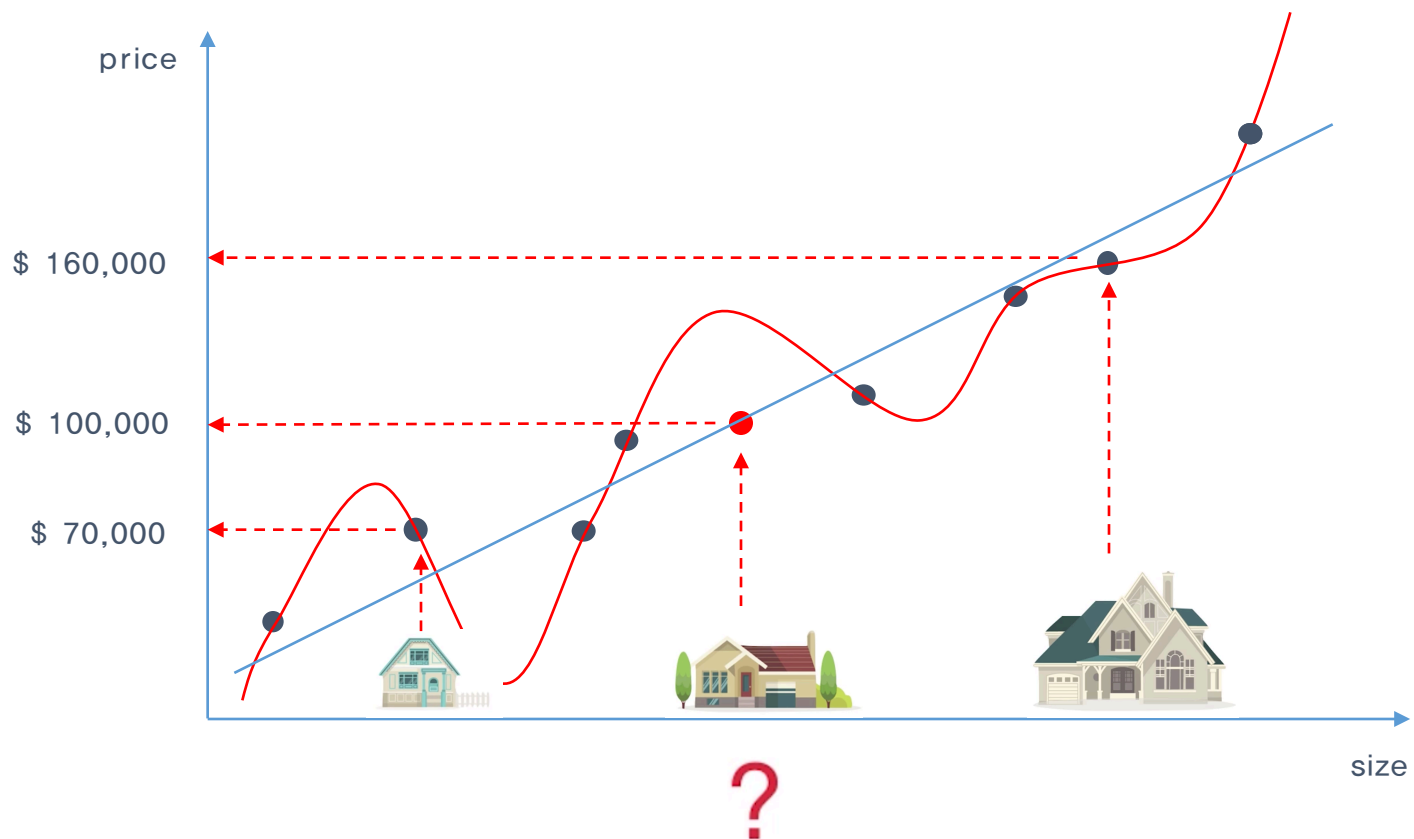
\$70,000

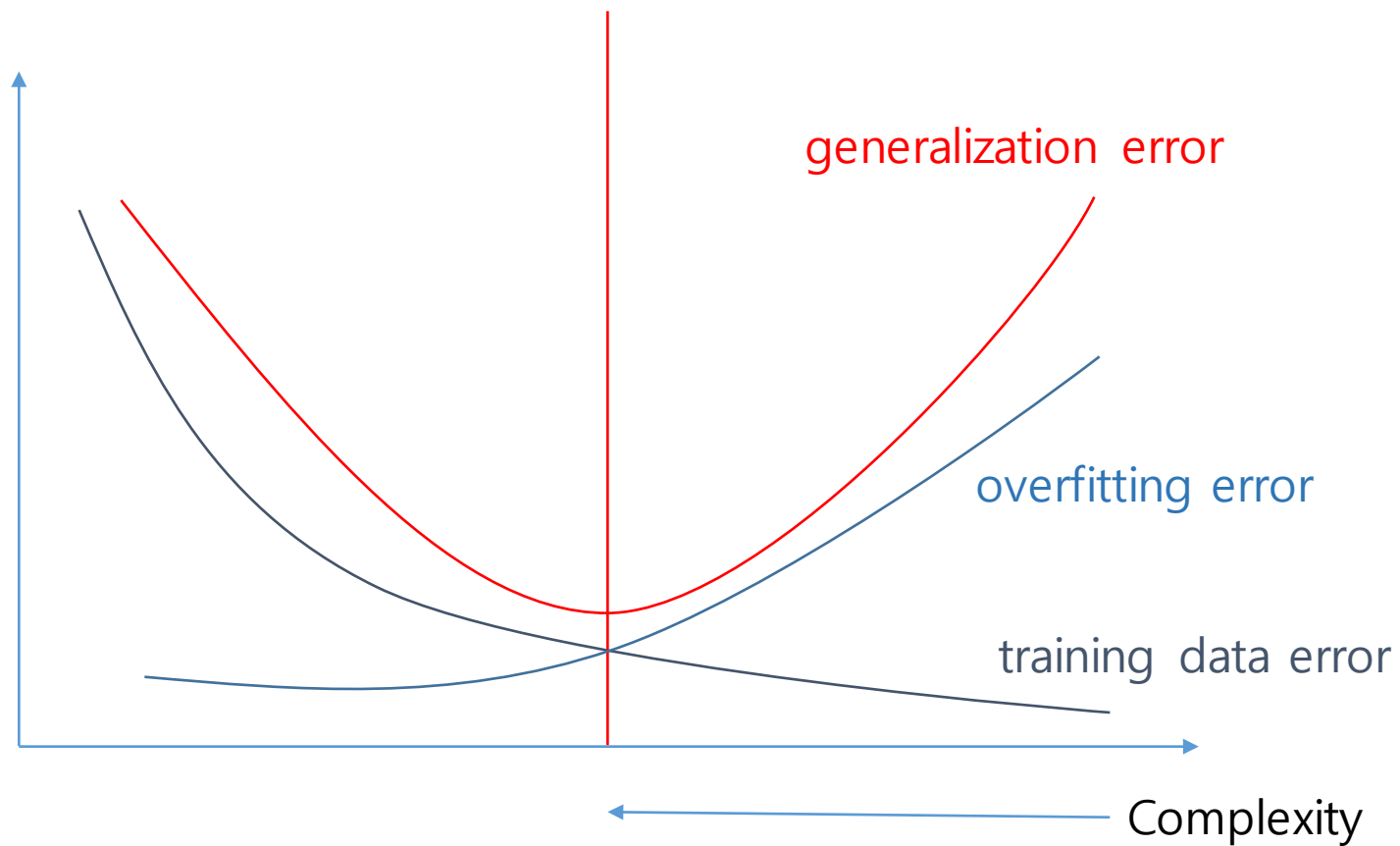


?

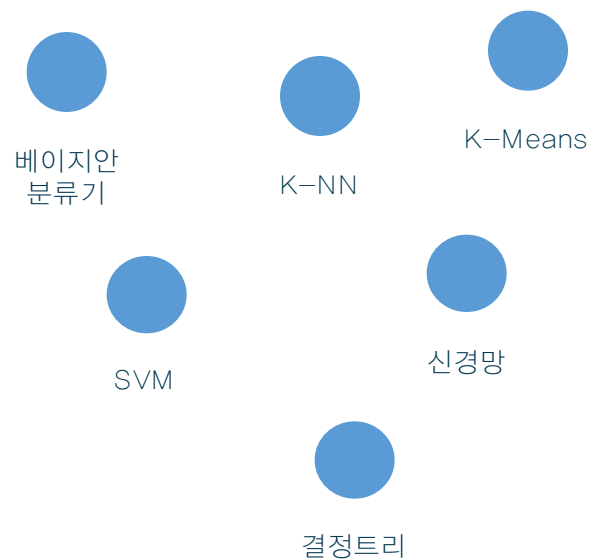


\$160,000

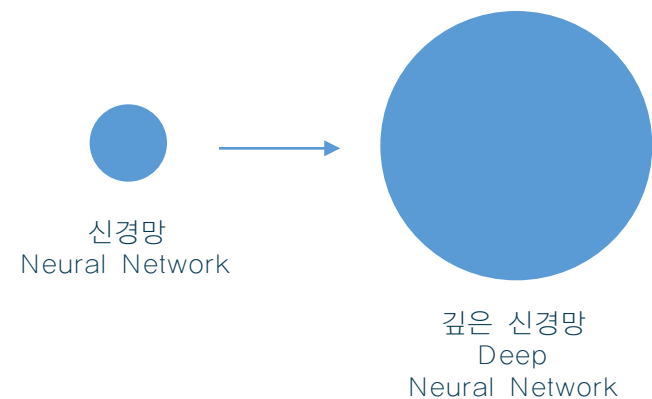




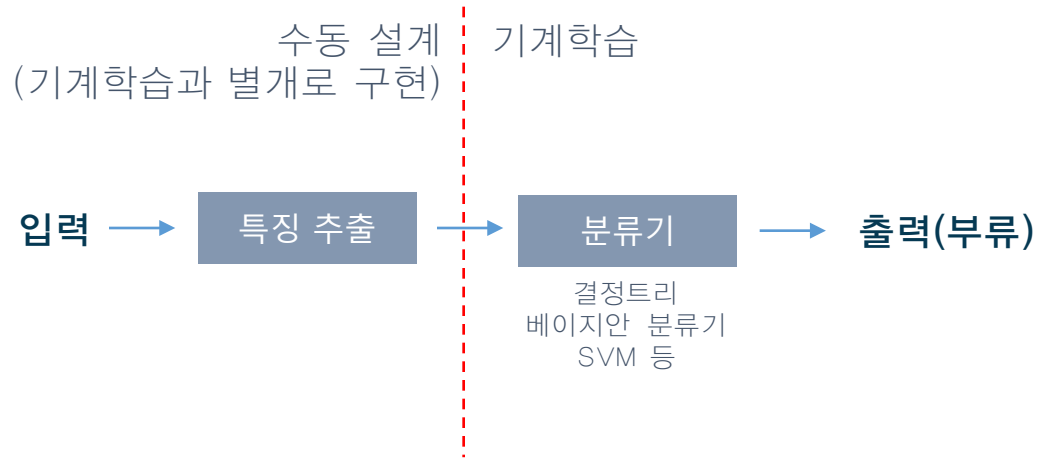
이전의 기계학습



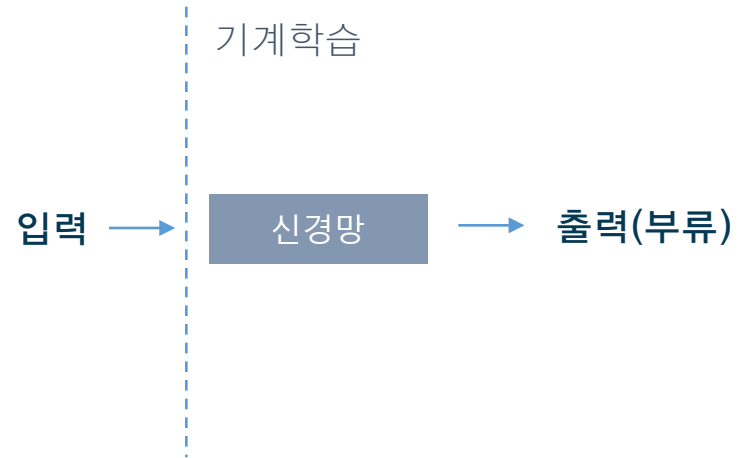
딥러닝



이전의 기계학습



딥러닝



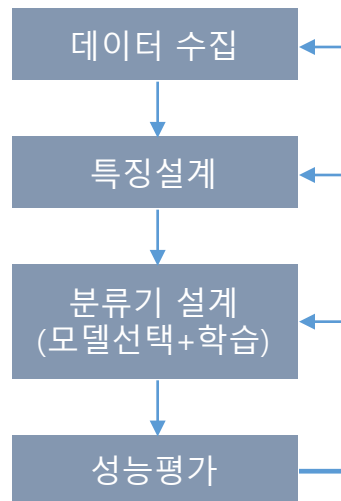
특징공간 변환

이전의 기계학습 : 전처리를 통한 특징 공간 변환

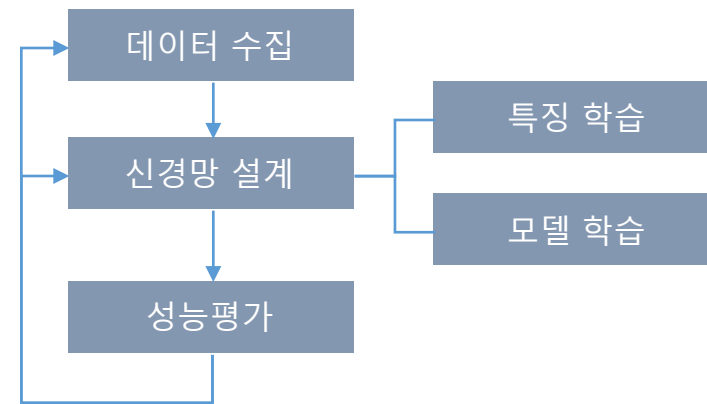
딥러닝 : 표현학습 representation learning

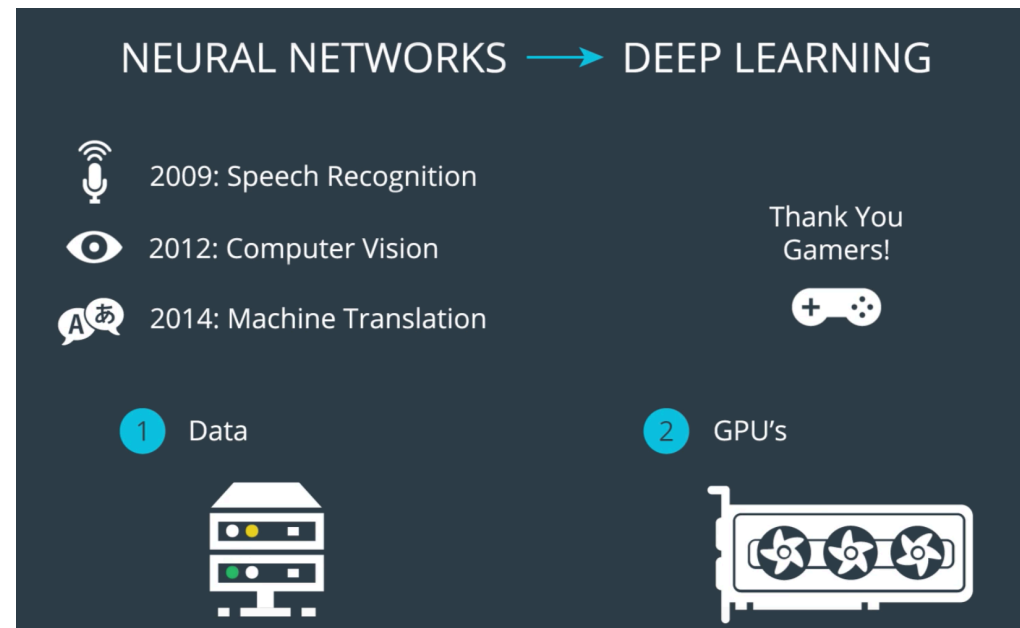
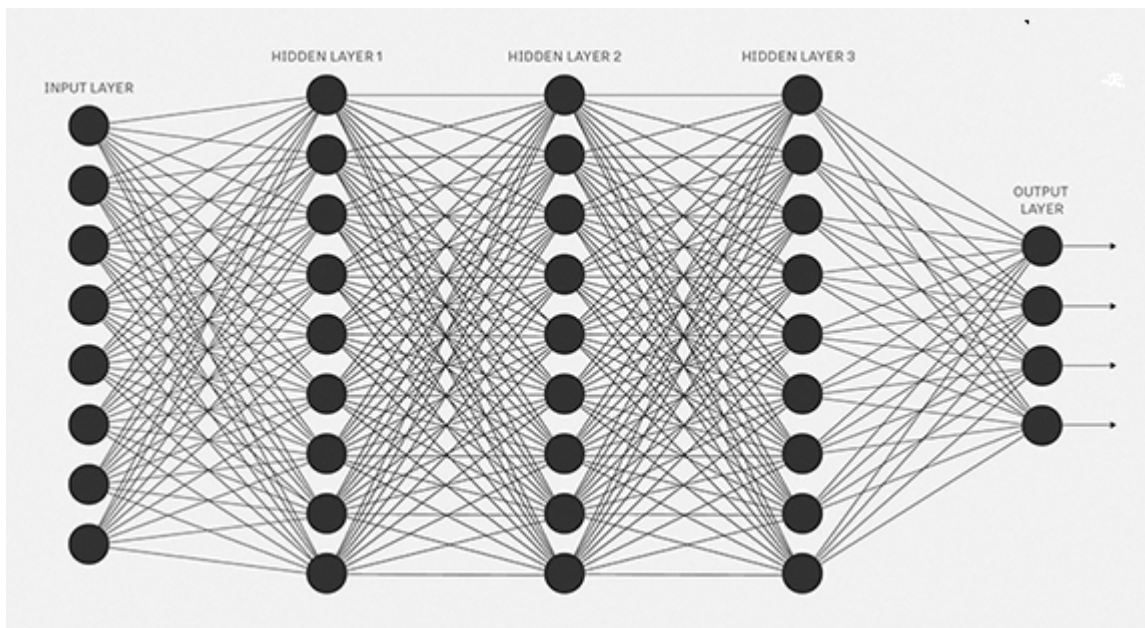
feature learning, representation learning₂₂

이전의 기계학습



현재의 기계학습(딥러닝)





값싼 GPU / 학습데이터 증가

성능 좋은 활성화함수 개발

효과적인 규제 기법 개발