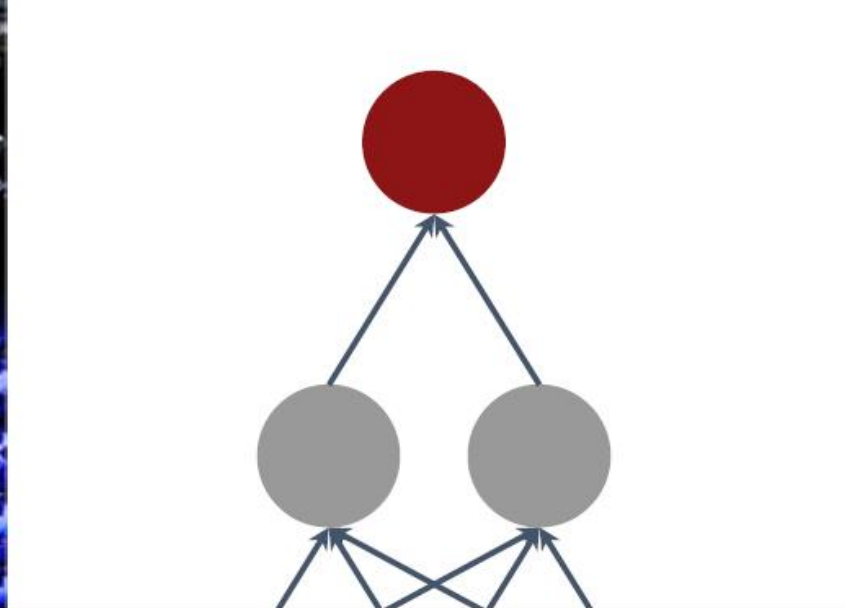


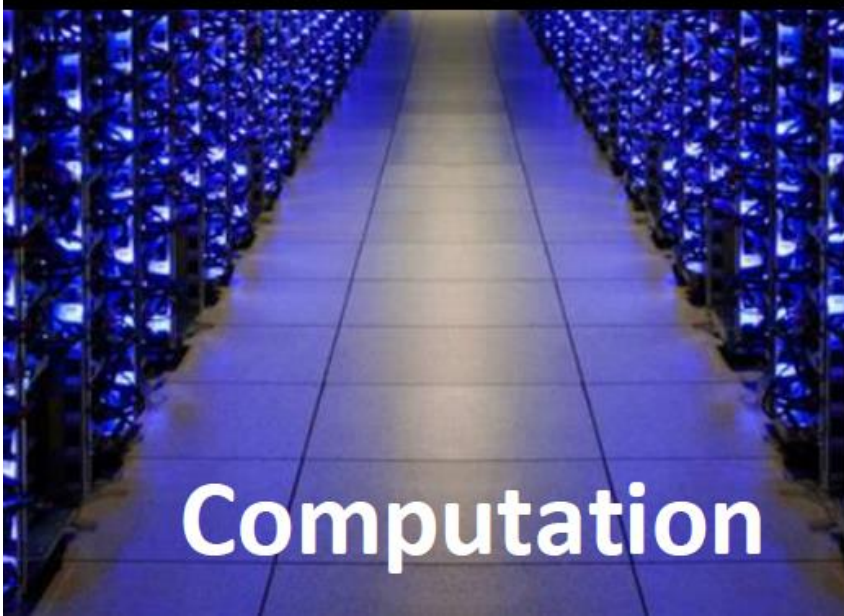
AI 개요



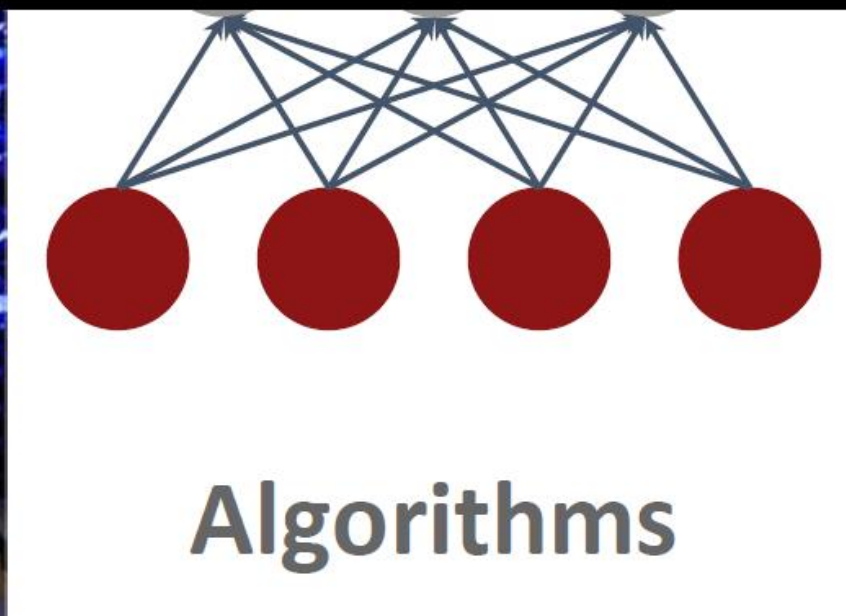
i am ai



The Deep Learning Revolution



Computation



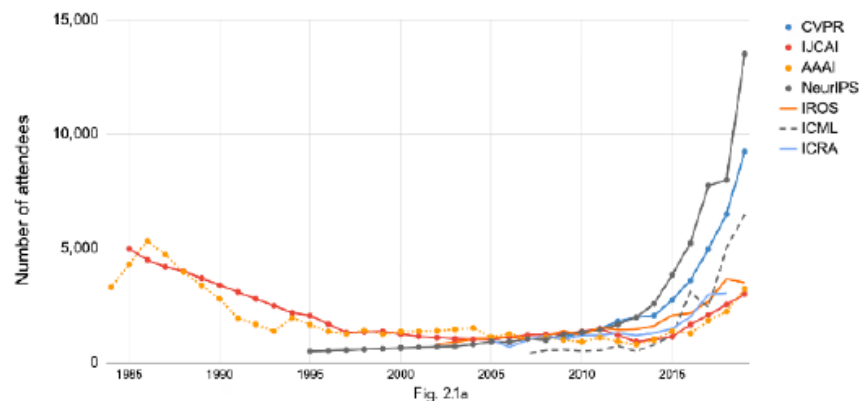
Algorithms



Data

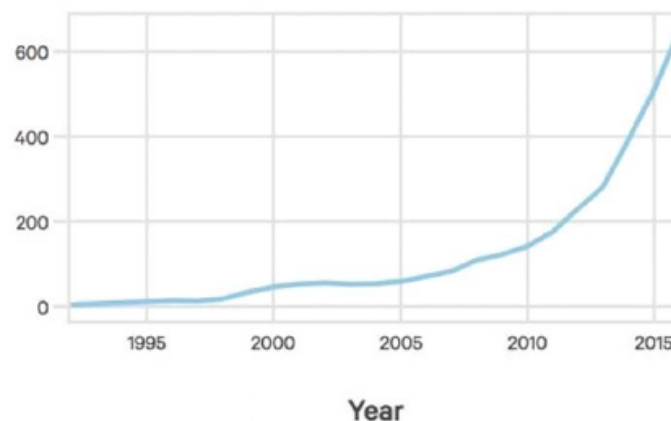
AI's Explosive Growth & Impact

Attendance at large conferences (1984-2019)
Source: Conference provided data.



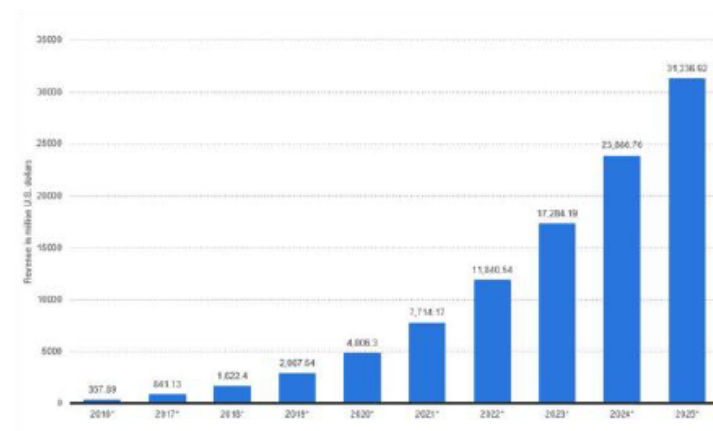
**Number of attendance
At AI conferences**

Source: The Gradient



**Startups Developing AI
Systems**

Source: Crunchbase, VentureSource, Sand
Hill Econometrics



**Enterprise Application AI
Revenue**

Source: Statista

인공지능(Artificial Intelligent)



인공 지능

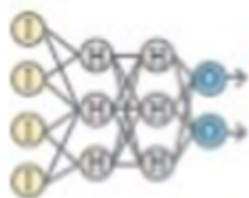
인간의 지적능력(추론, 인지)을 구현하는 모든 기술



머신 러닝

알고리즘으로 데이터를 분석, 학습하여 판단이나 예측을 하는 기술

선형회귀
로지스틱회귀
K-최근접 이웃
결정트리
랜덤포레스트
서포트 벡터 머신
클러스터링
차원축소



딥러닝

인공신경망 알고리즘을 활용하는 머신러닝 기술

심층신경망
(DNN)

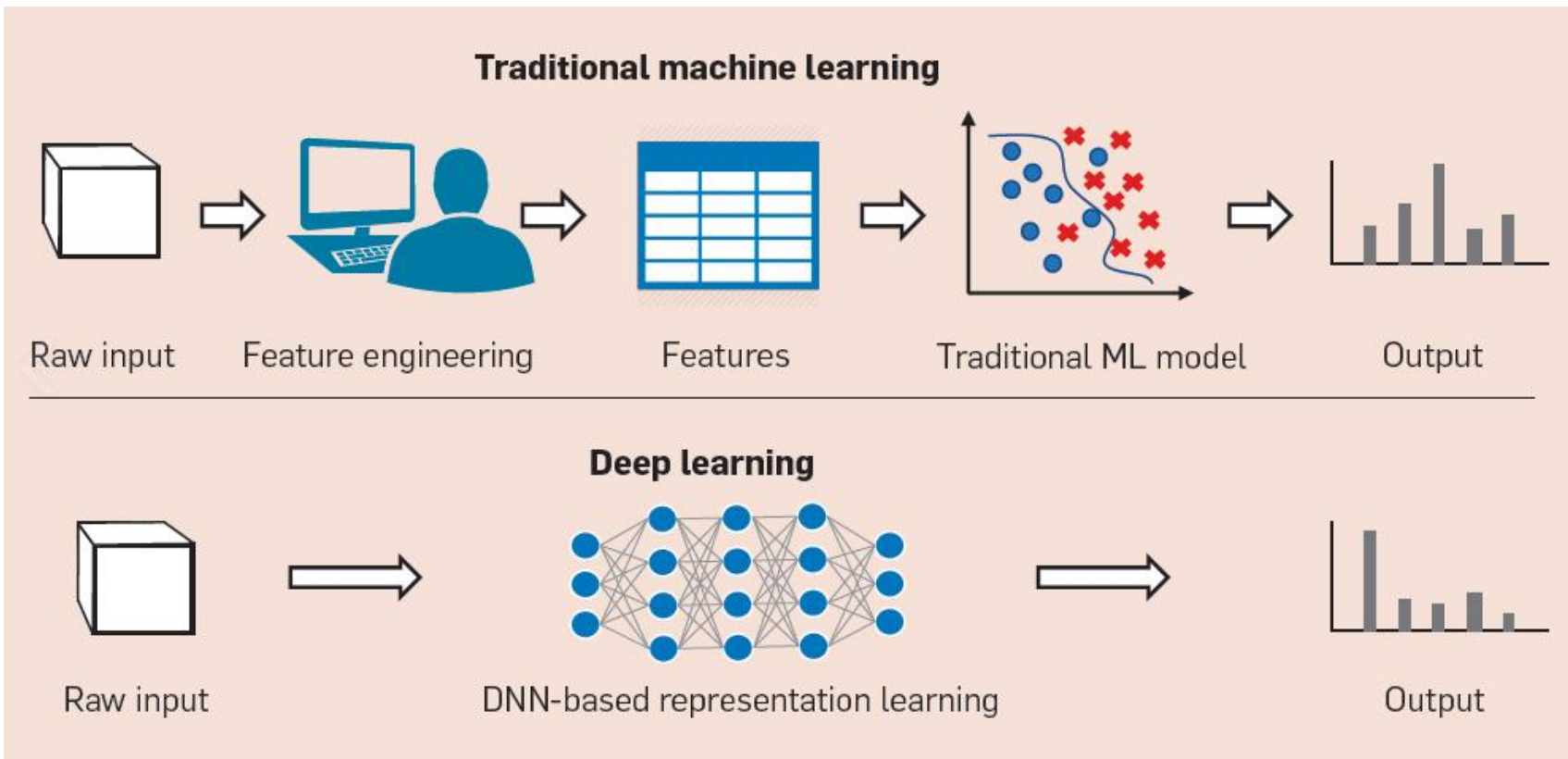
합성곱 신경망
(CNN)

순환 신경망
(RNN)

생성적 적대 신경망
(GAN)

강화학습
(RL)

머신러닝 VS 딥러닝

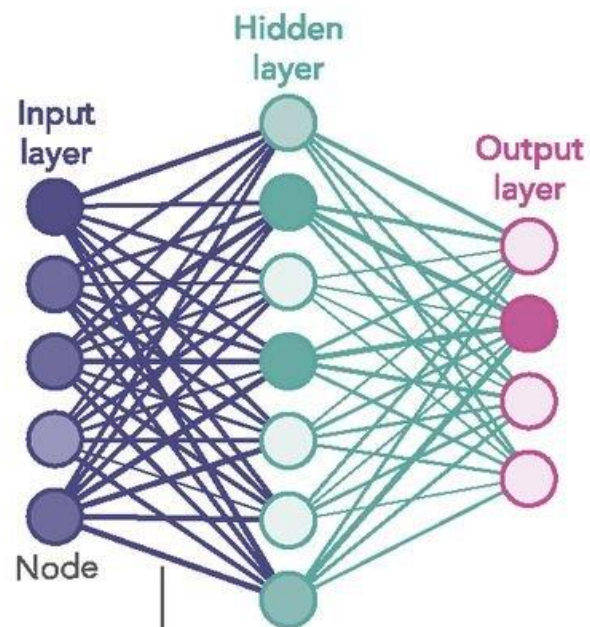


머신러닝에서는 데이터로부터 속성(Feature)을 찾아내는 역할을 컴퓨터(Machine)가 담당

딥러닝에서는 신경망으로 데이터/이미지를 '있는 그대로' 학습하며, 데이터에 포함된 중요한 속성을 컴퓨터가 스스로 학습

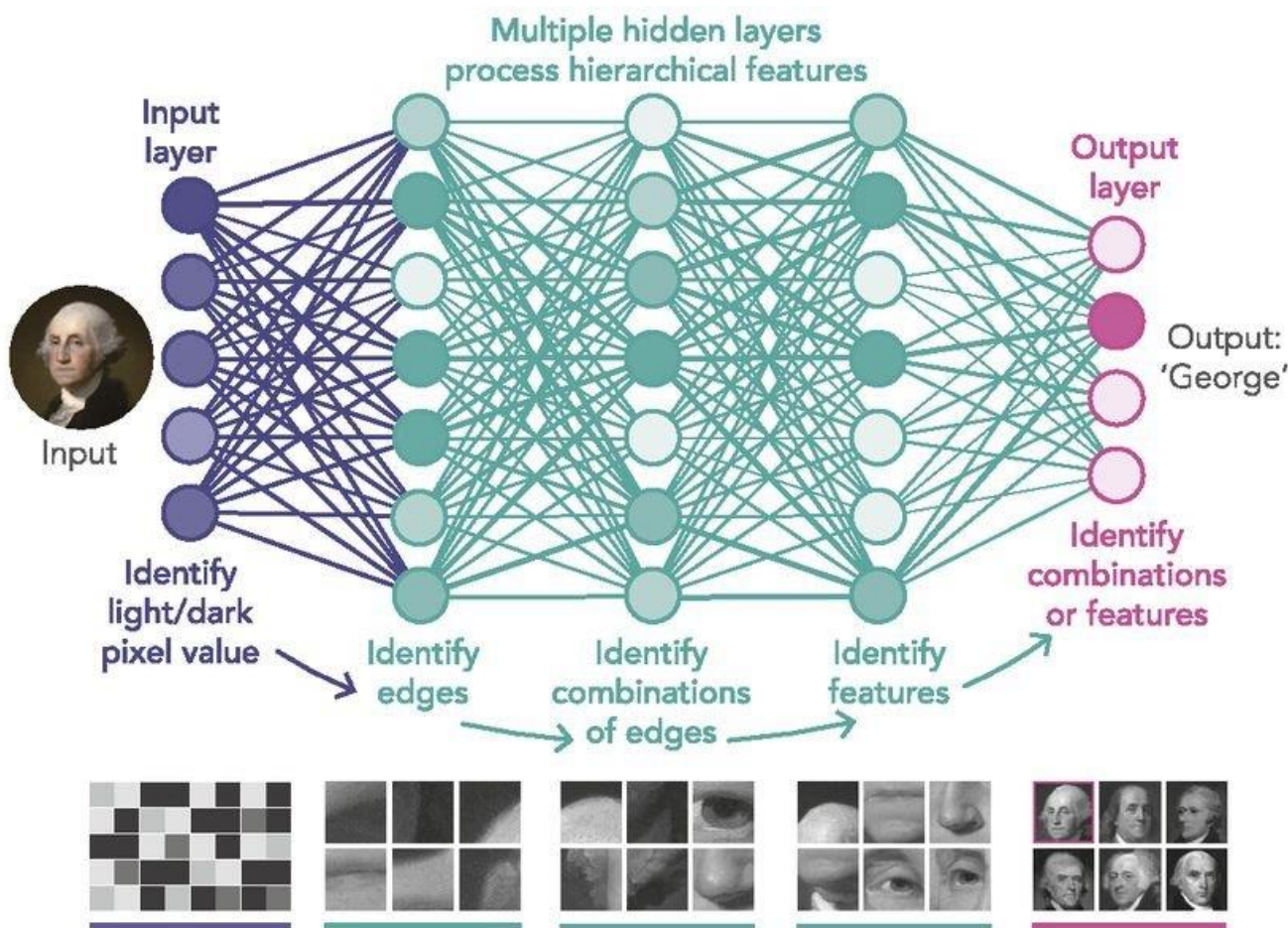
구분	머신러닝	딥러닝
동작원리	데이터에 머신러닝 알고리즘을 적용하여 분류/예측을 한다.	신호를 전달하는 신경망을 사용하여 데이터의 feature를 추출
적합한 학습 데이터량	수천개	수만/수백만개 이상
모델 훈련 소요시간	단시간	장시간

1980S-ERA NEURAL NETWORK

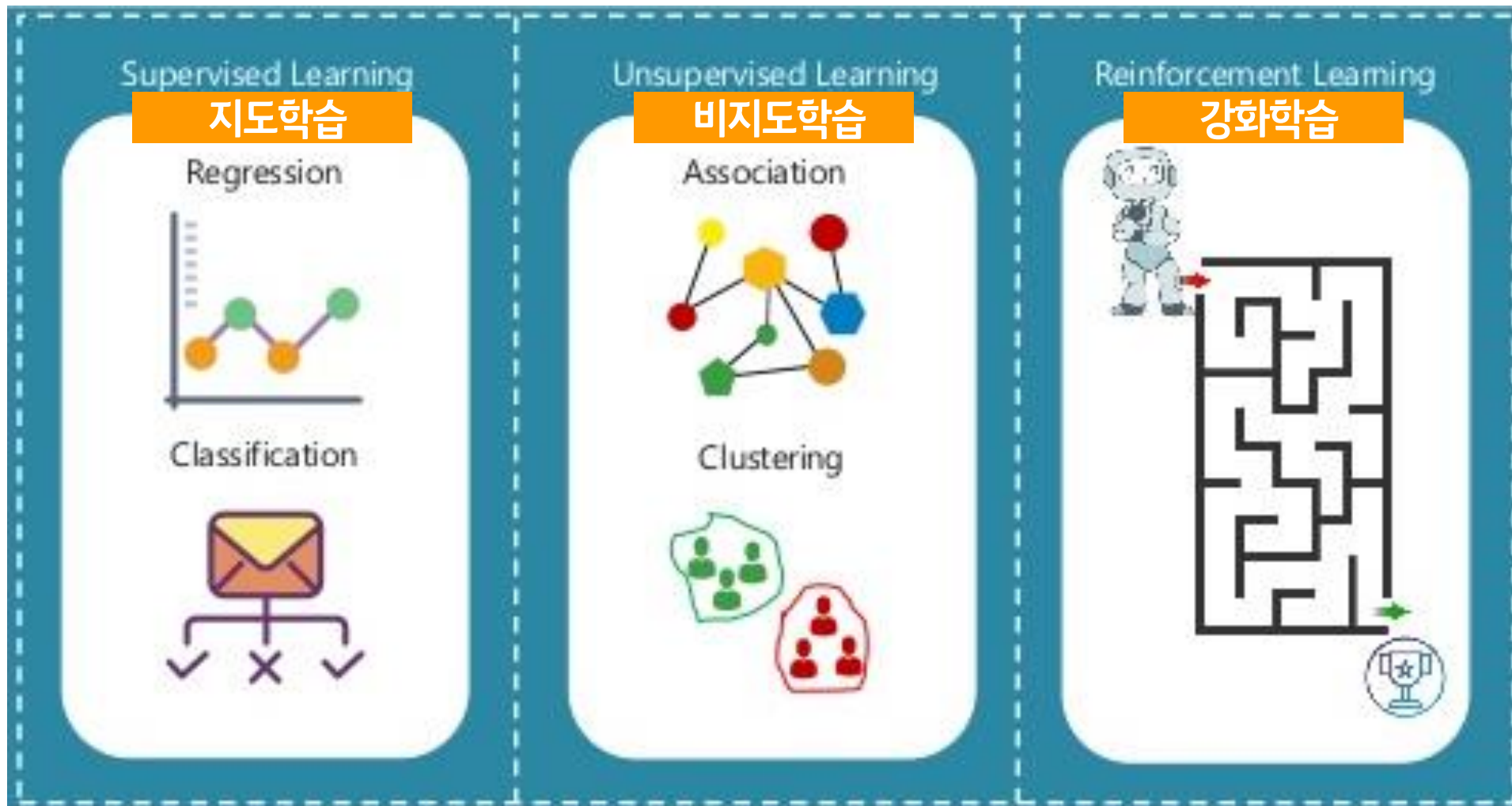


Links carry signals from one node to another, boosting or damping them according to each link's 'weight'.

DEEP LEARNING NEURAL NETWORK



딥러닝 학습 방법



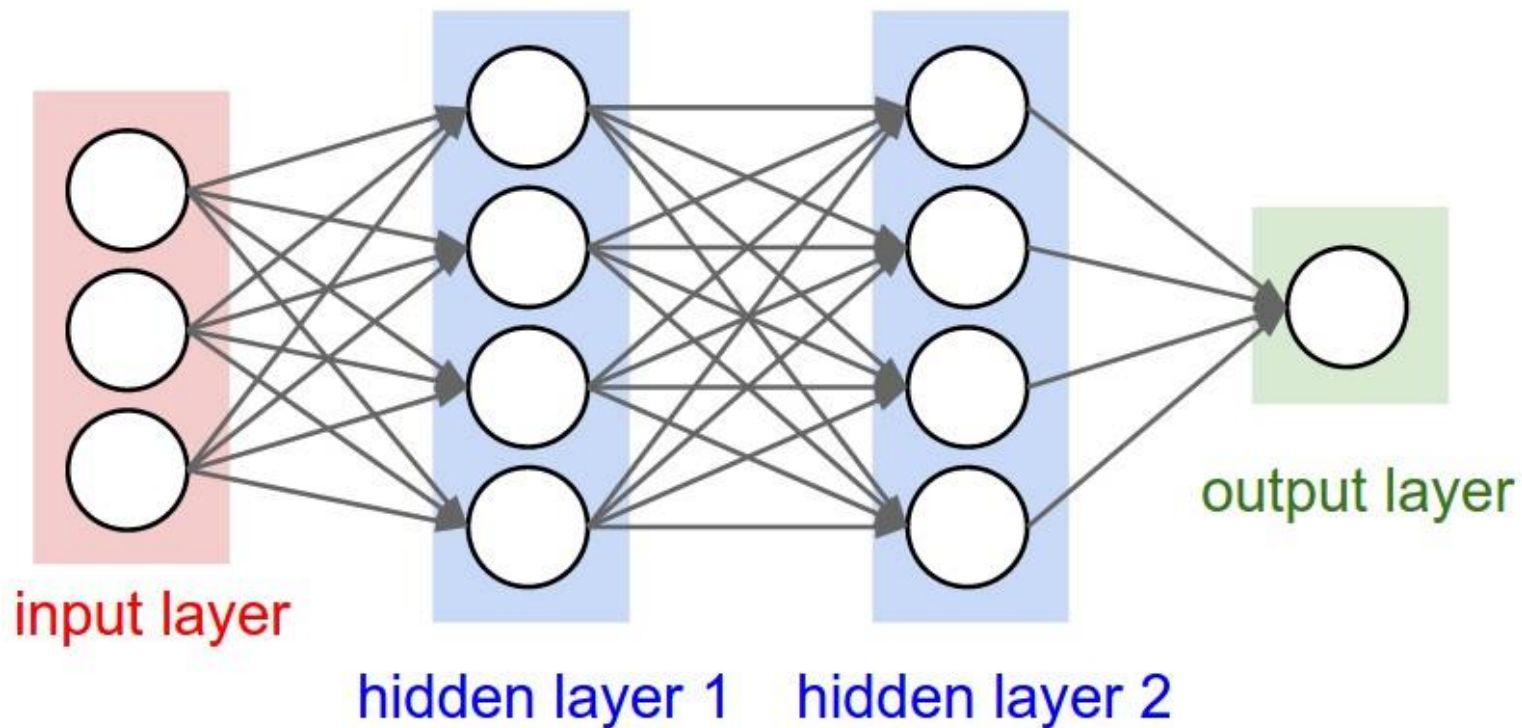
정답지(Label)로 학습
분류(Classification)
예측(Regression)

정답지(Label) 없이 학습
군집(Clustering)
차원 축소

시뮬레이션 반복 학습
성능 강화 등에 사용
마르코프 결정 과정(Markov Decision Process)

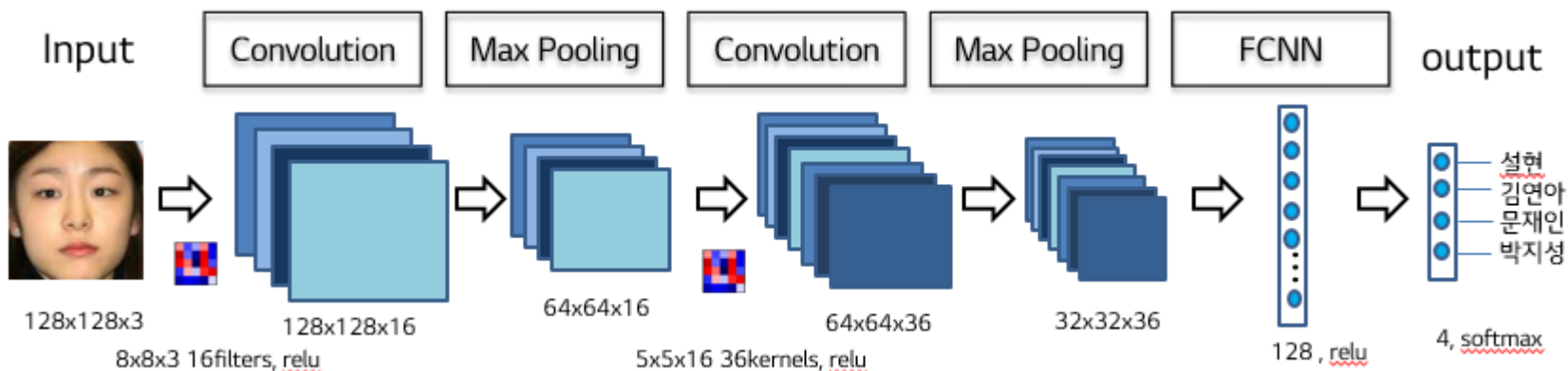
딥러닝 모델 - 심층신경망

- DNN : Deep Neural Network
- 사람의 신경망 원리와 구조를 모방하여 만든 알고리즘
- 입력층(input layer)과 출력층(output layer) 사이에 여러개의 은닉층(hidden layer)으로 이루어진 인공신경망
- 인공신경망의 레이어가 많아 질수록 높은 수준의 특징/패턴을 찾아내는 것이 가능해짐



딥러닝 모델 - 합성곱 신경망

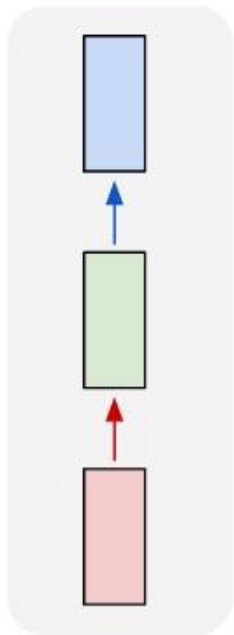
- CNN : Convolutional Neural Network
- 뇌의 시각 피질이 물체를 인식할 때 동작하는 방식에서 영감을 얻은 모델
- 1989년 얀 르쿤(Yann Lecun)과 동료들이 손글씨 숫자를 분류하는 신경망 구조를 발표
<http://yann.lecun.com/exdb/publis/pdf/lecun-90c.pdf>
- 이미지 분류 작업에서 탁월한 성능을 내며 컴퓨터 비전 분야를 크게 발전 시킴
- 2012년 Image Net 대회에서 기존의 모든 알고리즘을 압도하는 성능으로 1등을 차지함.



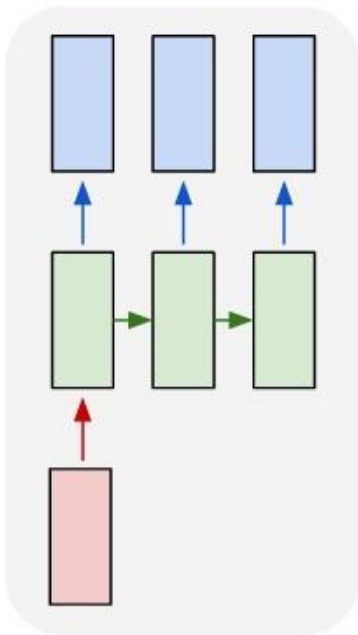
딥러닝 모델 - 순환신경망

- RNN : Recurrent Neural Network
- 순차적 정보가 담긴 데이터에서 규칙적인 패턴을 인식하고 추상화된 정보를 추출
- 텍스트, 음성, 음악, 영상 등 순차 데이터(Sequence Data)를 다루는데 적합

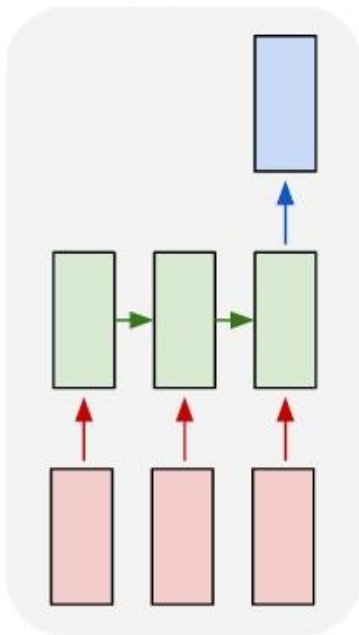
one to one



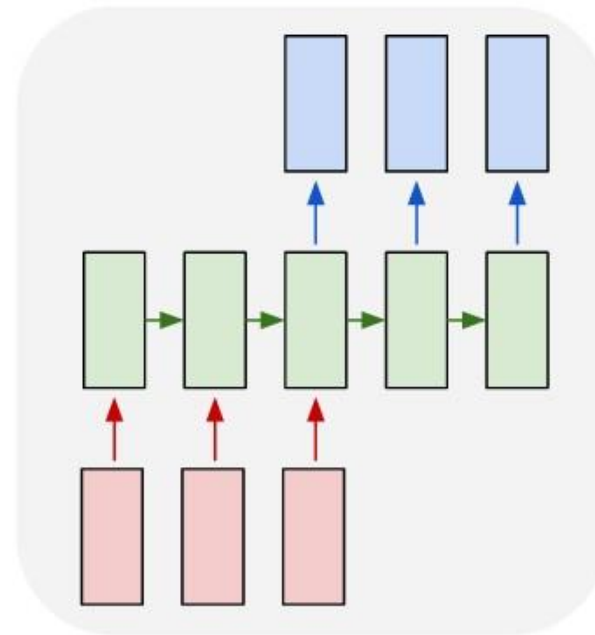
one to many



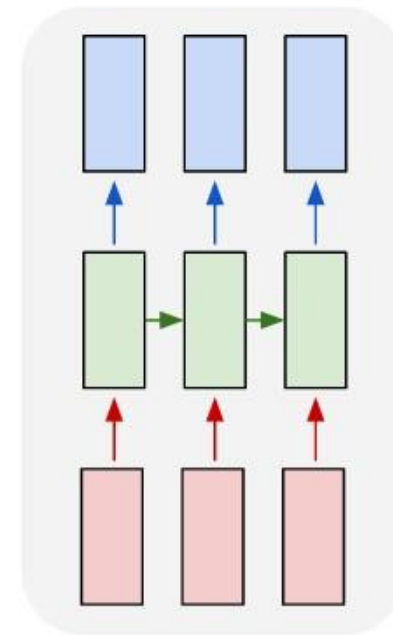
many to one



many to many

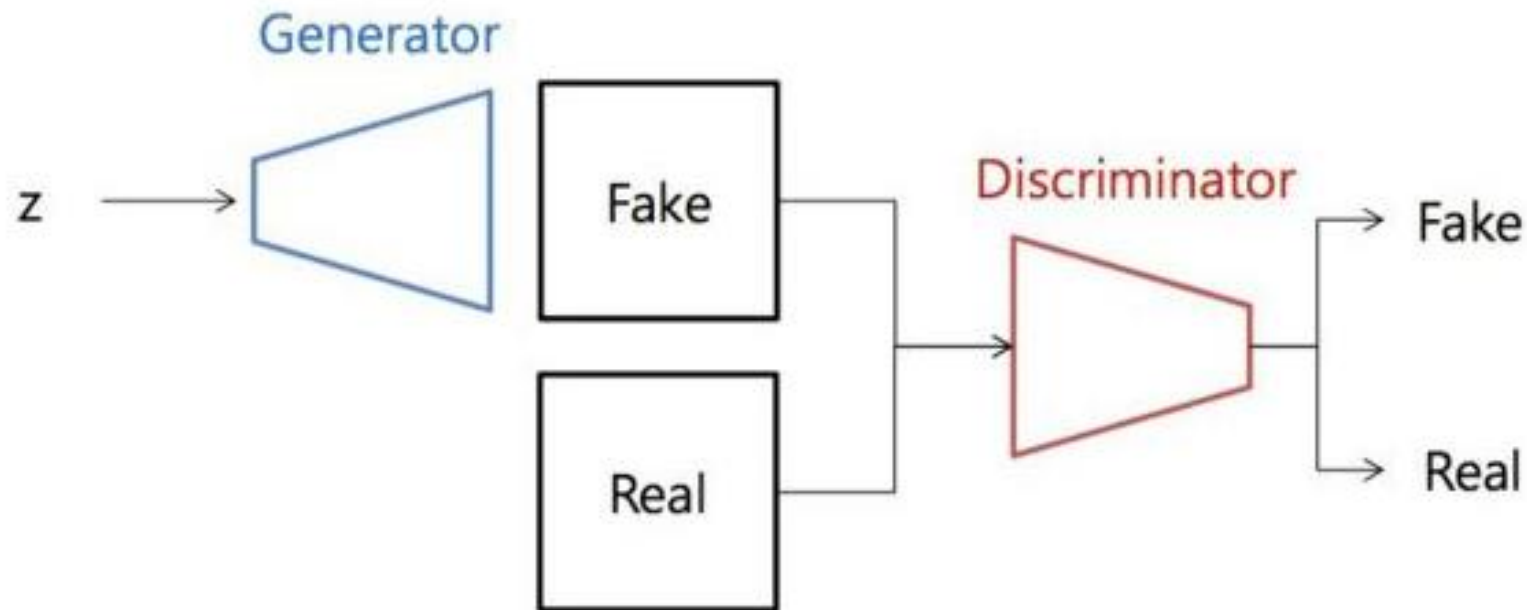


many to many



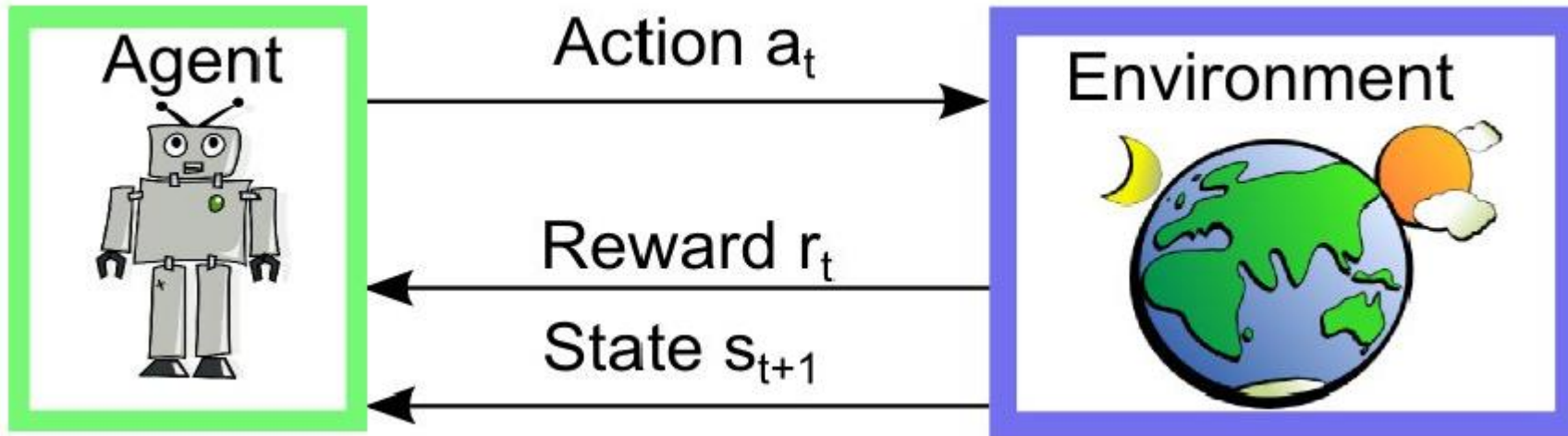
딥러닝 모델 - 생성적 적대 신경망(GAN)

- GAN : Generative Adversarial Network
- 생성자(Generator)와 판별자(Discriminator)가 경쟁(Adversarial)하며 데이터를 생성(Generative)하는 모델
- 2014년 이안 굿펠로우(Ian Goodfellow)와 동료들이 심층신경망으로 새로운 이미지는 합성하는 방법 발표
<https://papers.nips.cc/paper/2014/file/5ca3e9b122f61f8f06494c97b1afccf3-Paper.pdf>

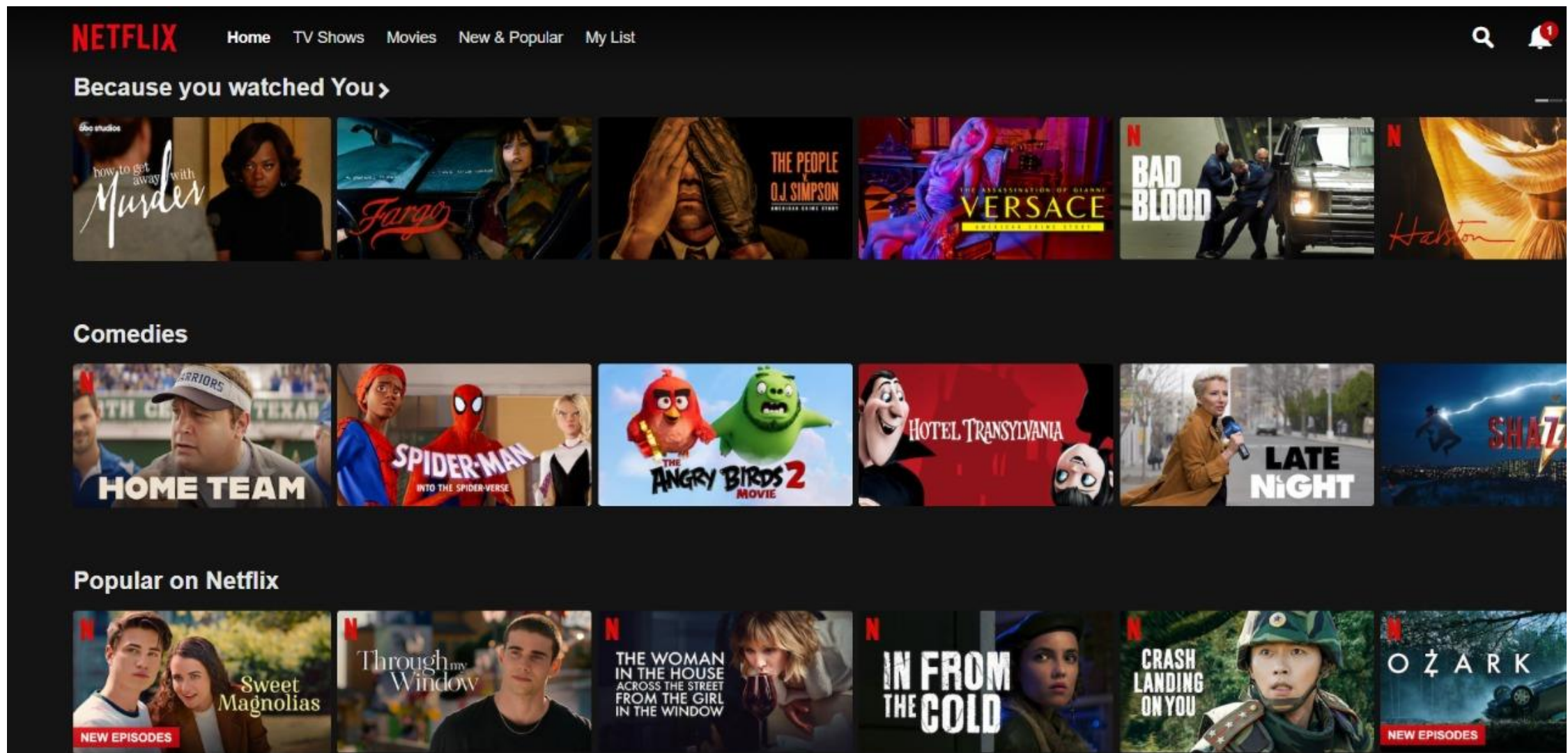


딥러닝 모델 - 강화학습

- RL : Reinforcement Learning,
- 어떤 환경(Environment) 안에서 정의된 에이전트(Agent)가 현재의 상태(State)를 인식하여 선택 가능한 행동(Action)들 중 보상(Reward)을 최대화하는 행동 혹은 행동 순서를 선택하는 방법



딥러닝 활용사례 - 개인화 추천



딥러닝 적용사례 - 사운드 트랙 작곡

The screenshot displays the Sibelius 7 interface during a music production session. The top window shows the score for "A Diary of Winter" with a timeline from 01:56:22.07 to 1:05.0000. The score is divided into sections: Intro, Theme A, Theme A (Repeat), Theme B, and another Intro. The instruments listed include Celli, Basses, Steinway Grand Piano, Violins 1, Violas, Cellos, and Basses. The Piano Roll view is active, showing a complex rhythmic pattern for the "Choir Women (Legato)" part. The piano roll includes a piano roll editor with a keyboard view on the left and a piano roll editor with a piano roll editor on the right. The piano roll editor shows a complex rhythmic pattern with many notes and rests. The piano roll editor is set to 1/8 Triplet (1/12) and has a strength of 100. The piano roll editor is also set to Scale Quantize (Major) and has a velocity of 127. A video inset in the bottom right corner shows a person wearing headphones and a red hoodie, likely the composer or producer, working on the music.

딥러닝 활용사례 - 이미지 생성(Style Transfer)



딥러닝 활용사례 - 이미지 생성

DALL·E 2 is a new AI system that can create realistic images and art from a description in natural language.

TEXT DESCRIPTION

An astronaut Teddy bears A bowl of
soup

riding a horse lounging in a tropical resort
in space playing basketball with cats in
space

in a photorealistic style in the style of Andy
Warhol as a pencil drawing



딥러닝 활용사례 - 자연어 처리

GPT-3 performs a wide variety of natural language tasks, and Codex, which translates natural language to code.



Code completion Private beta

Generate, edit, and explain code



Text completion

Generate and edit text



Fine-tuning

Train a model for your use case



Embeddings

Search, classify, and compare text

```
Score: 228

/* Record start time and
whether the player has already
won. */
var startTime = Date.now();
var playerWon = false;

/* Once the player reaches 250
points, they win! (1) Clear
the document, (2) Tell them
how long it took in seconds,
in green. */
var winCheck =
setInterval(function() {
  if (score >= 250 &&
!playerWon) {

clearInterval(scoreIncrement);

clearInterval(asteroidOverlapC
heck);

clearInterval(asteroidCollisio
nCheck);
playerWon = true;
}
```

<https://youtu.be/Zm9B-DvwOgw>

딥러닝 활용사례 - 멀티 모달 검색

🔍 I've hiked Mt. Adams and now want to hike Mt. Fuji next fall, what should I do differently to prepare?



fitness training
for the terrain



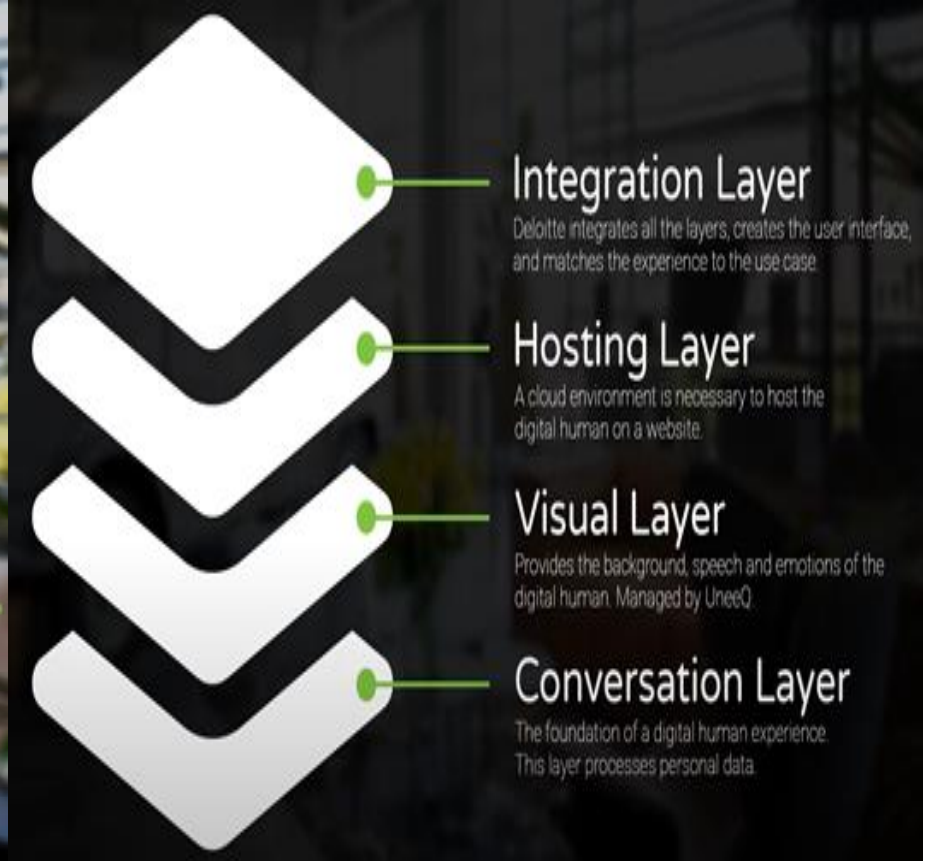
hiking gear for
Fall weather

the Yoshida Trail is one of the
easier routes

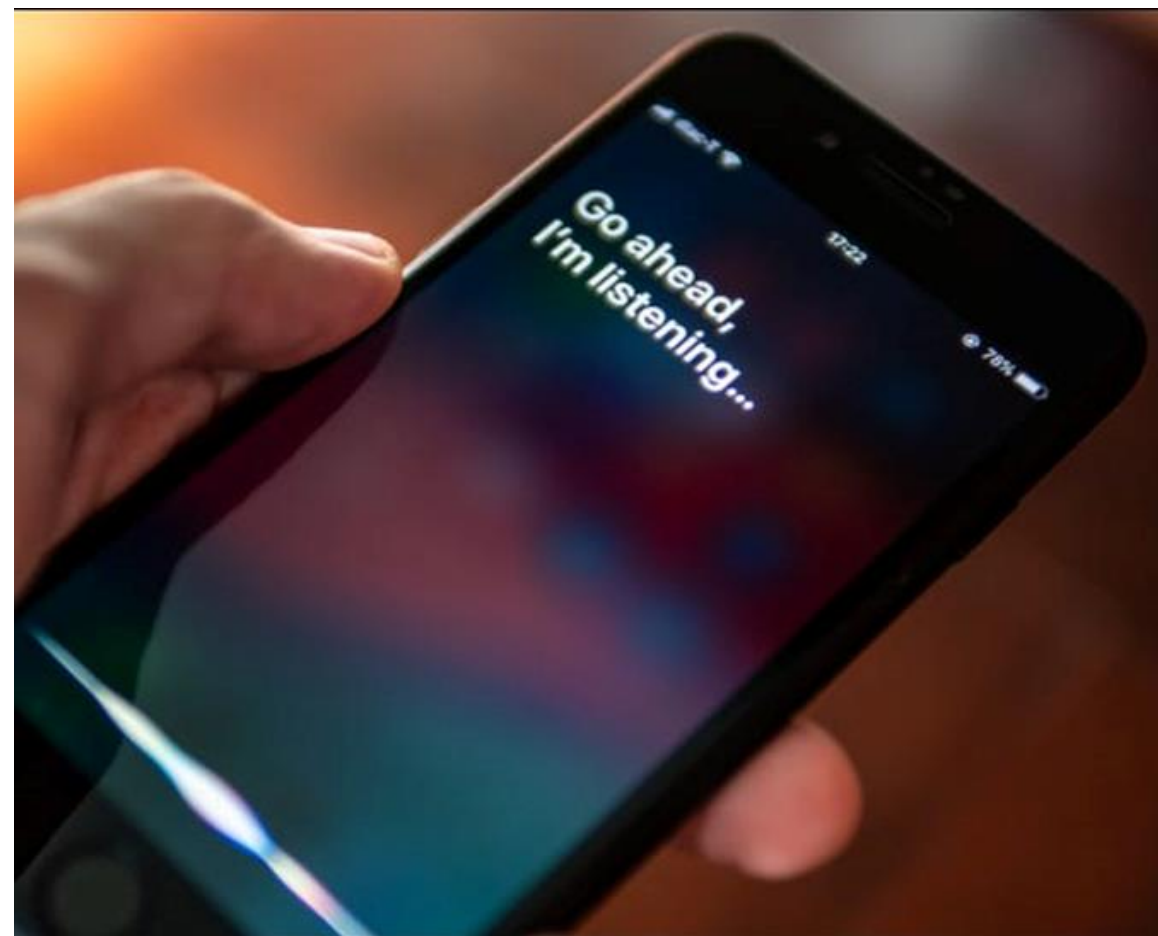
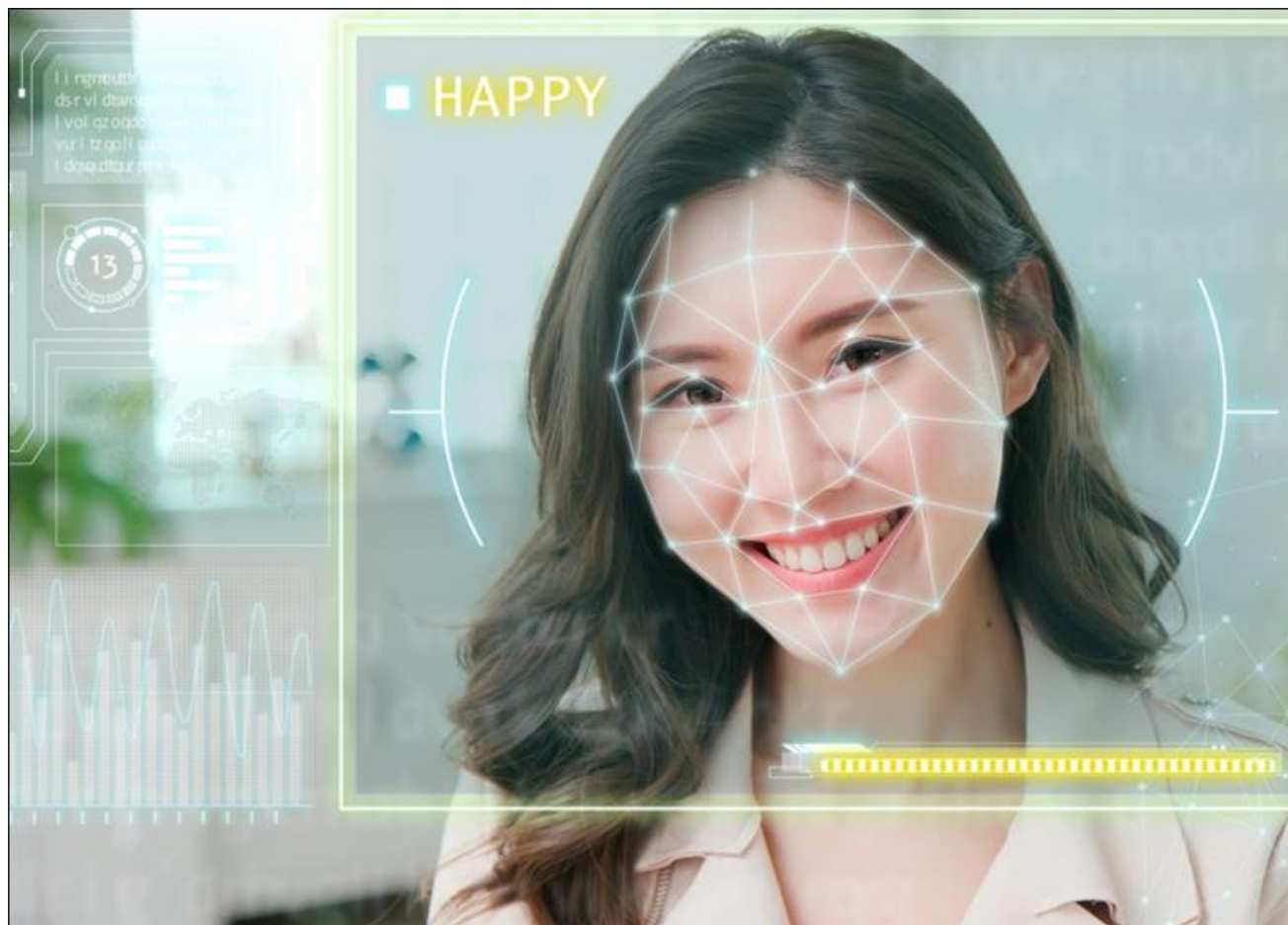
official climbing season is from
July to September

altitude sickness can be an issue

딥러닝 활용사례 - 디지털 휴먼



딥러닝 활용사례 - 감성 컴퓨팅



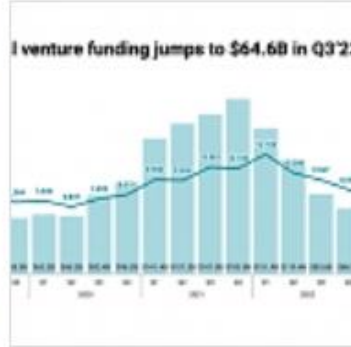
기술트렌드 서치



"Artificial intelligence" Trends : 100/1020



This Single Person Electric VTOL Aircraft Leverages AI Assist



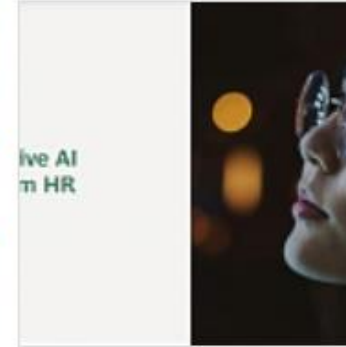
State of Venture Q3'23 Report



(PDF) EdTech Threats to Student Privacy and Equity in the Age of AI



Can Luxury Make Tech Wearables Cool ?



(PDF) BCG - How Generative AI Will Transform HR



Adobe AI is Coming for Your Branding



AI is Policing the Package Theft Beat for UPS As 'Porch Piracy' S...



(PDF) McKinsey - The Promise of Travel in The Age of AI



Can AI Beat the Market? Wall Street Is Desperate to Try



Meta's New AI Chatbots Let Users Text and Ask Advice from Paris Hi...

기술트렌드 서치



THANK YOU

kgpark88@gmail.com