[Introduction]
Reinforcement and Generative Learning
인공지능 특강

Sangkeun Jung

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정상근

Intelligence Architect

- Artificial Intelligence
- Natural Language Understanding

2010 ~ 2012 : Samsung Electronics
2012 ~ 2014 : ETRI
2014 ~ 2018 : SK telecom
2018.09 ~ : Chungnam National University

學 習
학 습

Learning **Practice**

Reduce time
to understand concepts and ideas

Internalize
them to your owns asset

In this lecture,
I will focus on delivering the understanding
not on giving knowledge

Time is **valuable**

"Value your own time"
"Respect your lecturer's time"

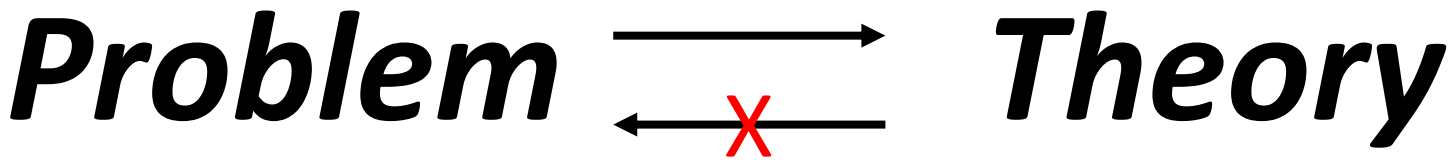
- ✓ Tardiness is not allowed
- ✓ Keep the due date

English

In this lecture,
I will use English terminology without translation.
It might be much better to search related knowledge from the web.

Practitioner

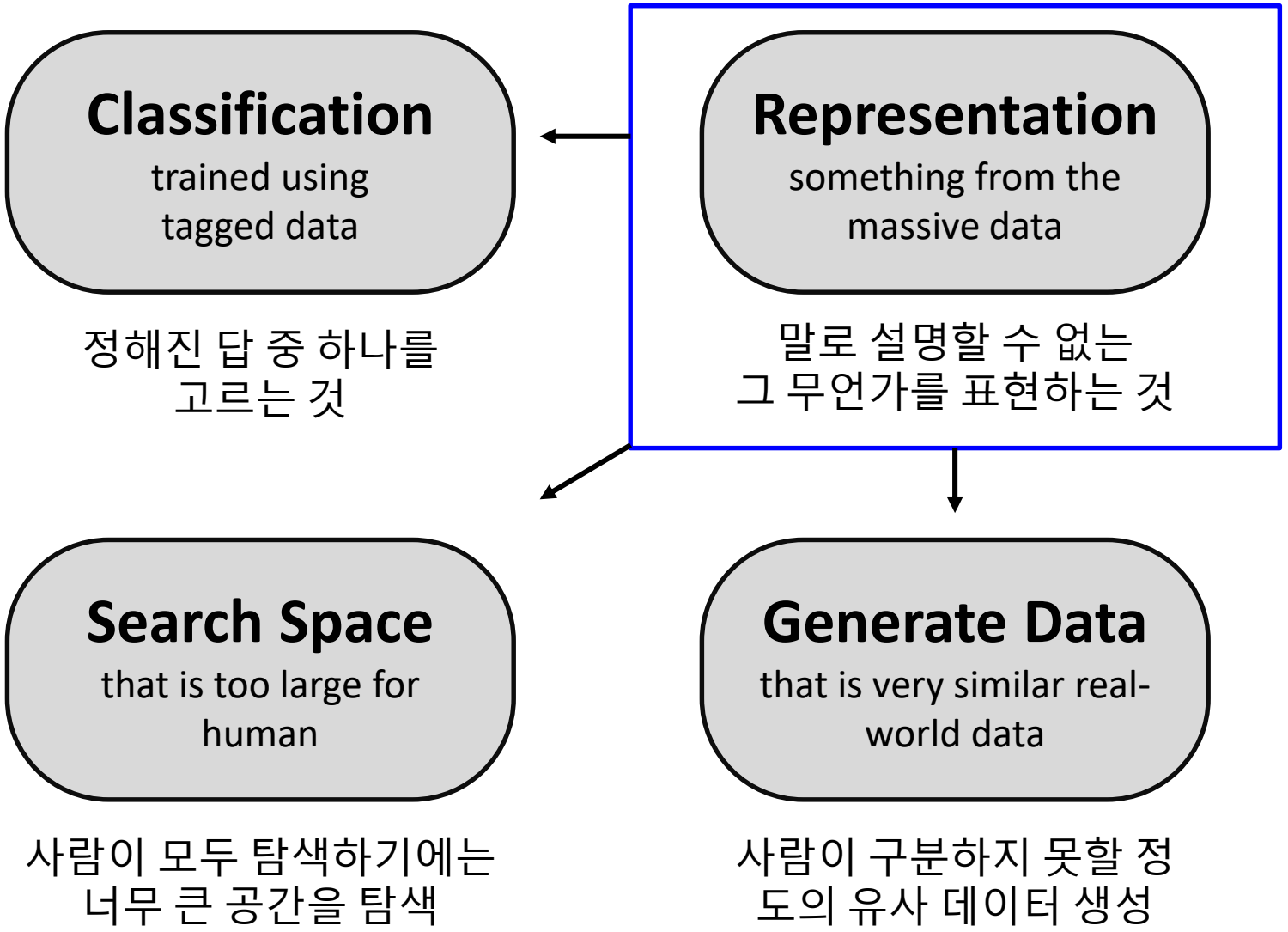
Implementation is everything


Problem
Theory

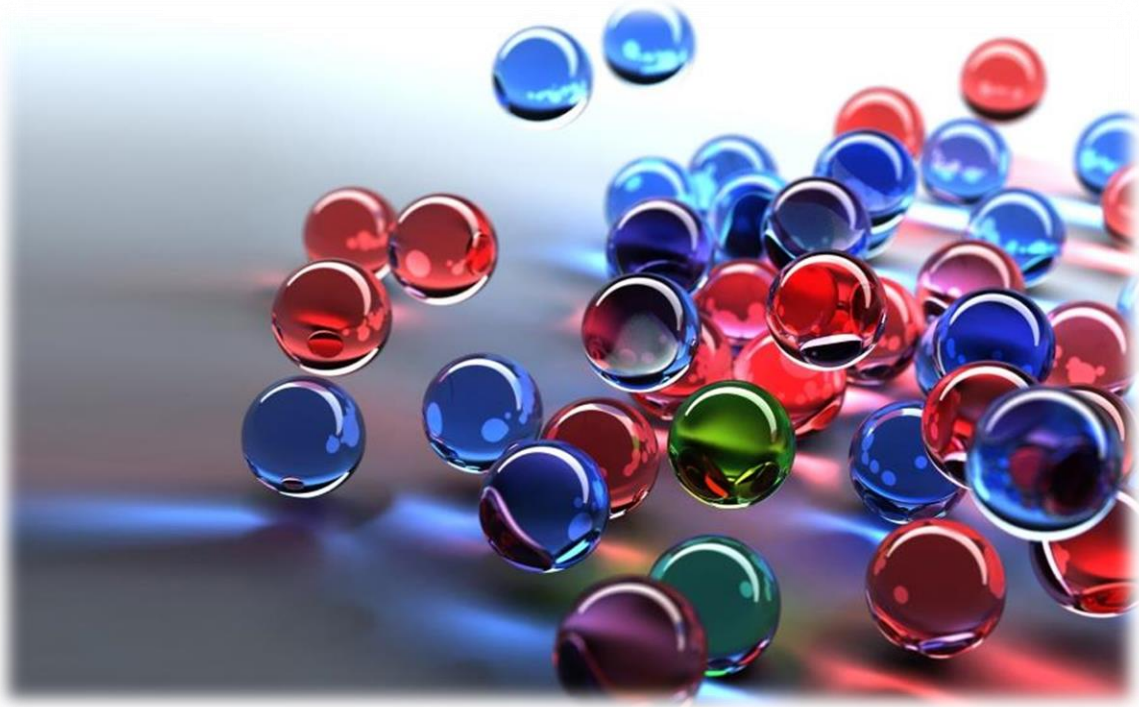
AI | Best Framework so far

GOOD & BAD

Discovered Best Frameworks that AI Works Well (2019)

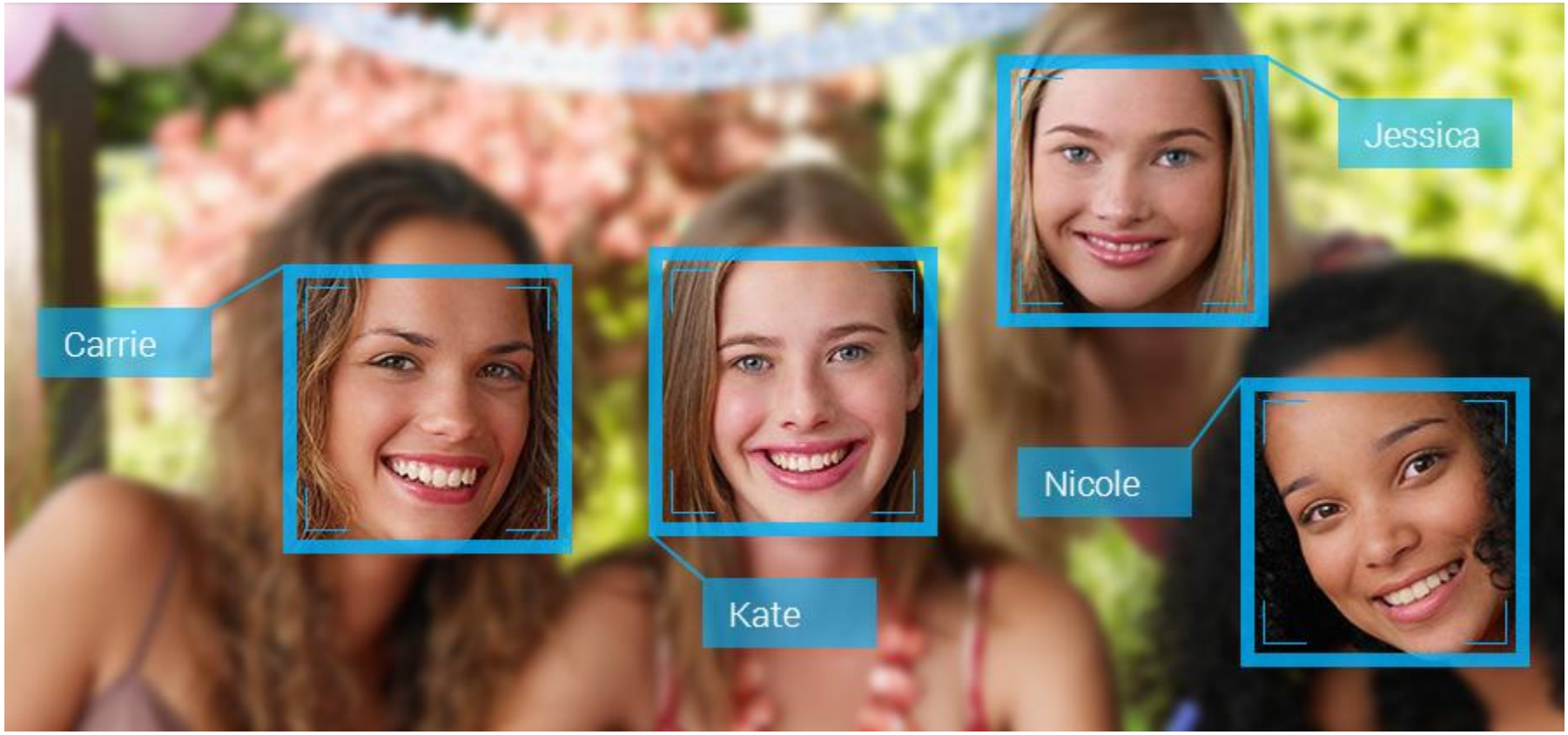


고르는 것

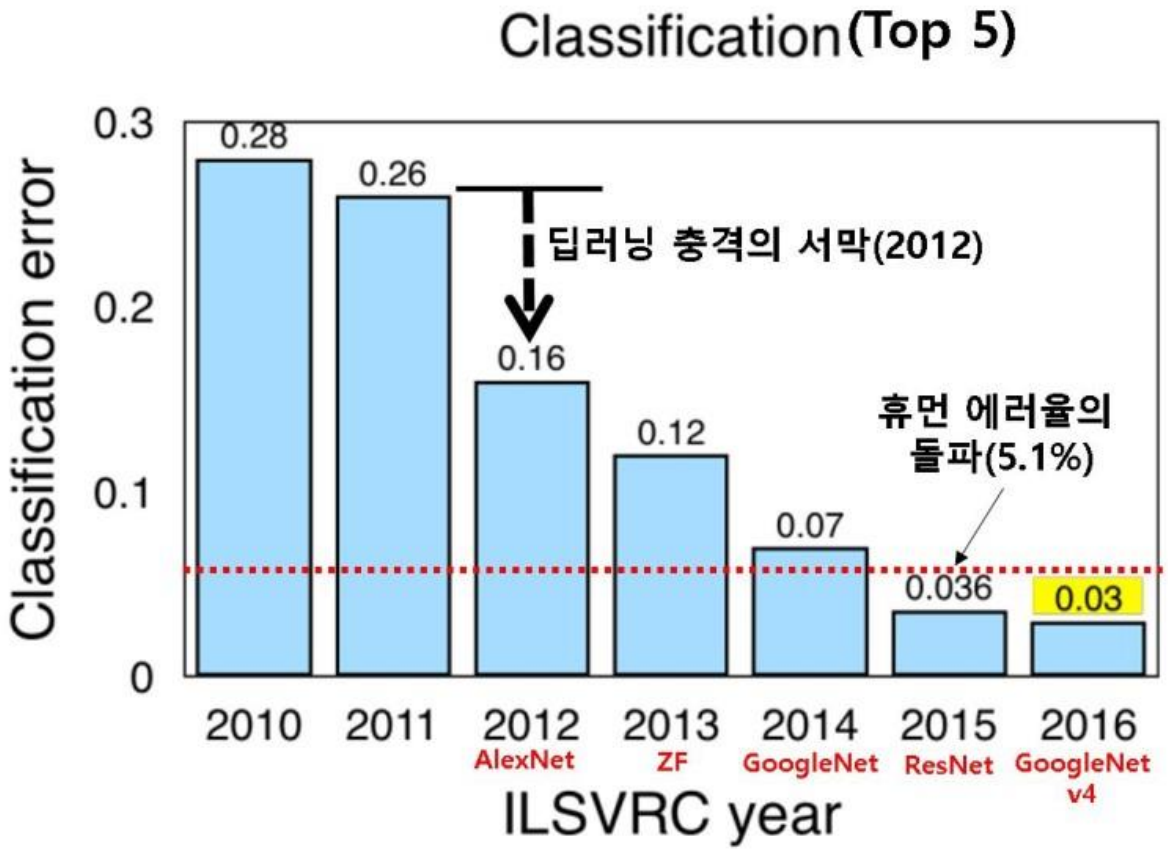


What AI can DO | Classification

고르는 것



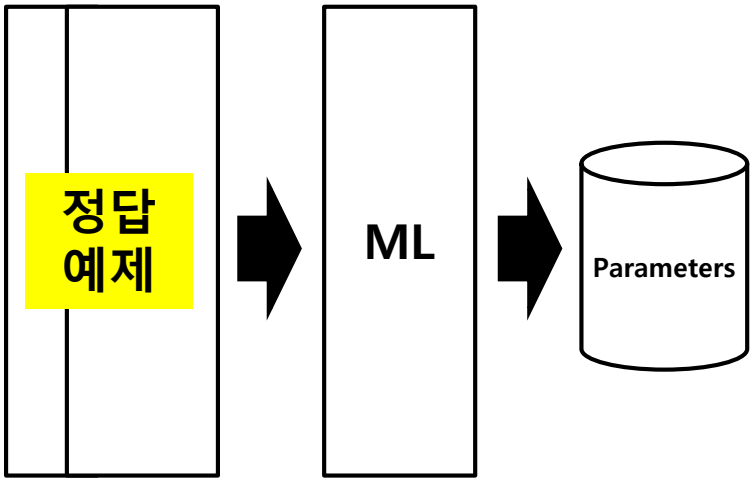
What AI can DO | Classification



ISLVRC(ImageNet Large Scale Visual Recognition Competition)

https://kwnam4u.blog.me/221491273704?fbclid=IwAR2KgH21T-NMtH-x0-DGTJpADJ-0WIM8sDpcQzbJ4m0Zlp3s2mp9rIgucmg

Supervised Learning



① 예제 문제를 풀게 하고
② 정답과 비교하여
③ 잘 맞추는 방향으로 학습

- ✓ K-Nearest Neighbors
- ✓ Linear Regression
- ✓ Logistic Regression
- ✓ Support Vector Machines
- ✓ Conditional Random Fields
- ✓ Decision Tree
- ✓ Deep Neural Network

사람이 가보지 못한/못할 길을
먼저 가보는 것

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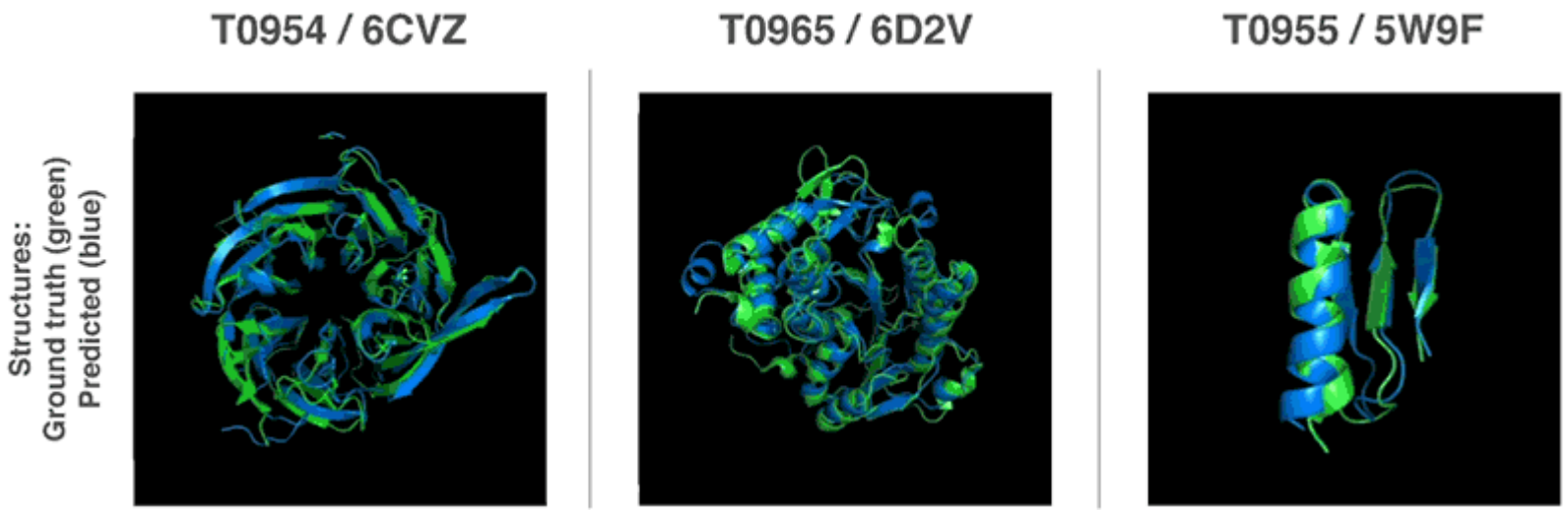
사람이 가보지 못한/못할 길을 먼저 가보는 것

:: Reinforcement Learning 을 이용한 Pan 뒤집기
:: 약 50번정도의 시행착오를 거치면, 거의 완벽하게 수행
:: https://www.youtube.com/watch?v=W_gxLKSsSIE&list=PL5nBAYUyJTrM48dViibyi68urttMlUv7e&index=1

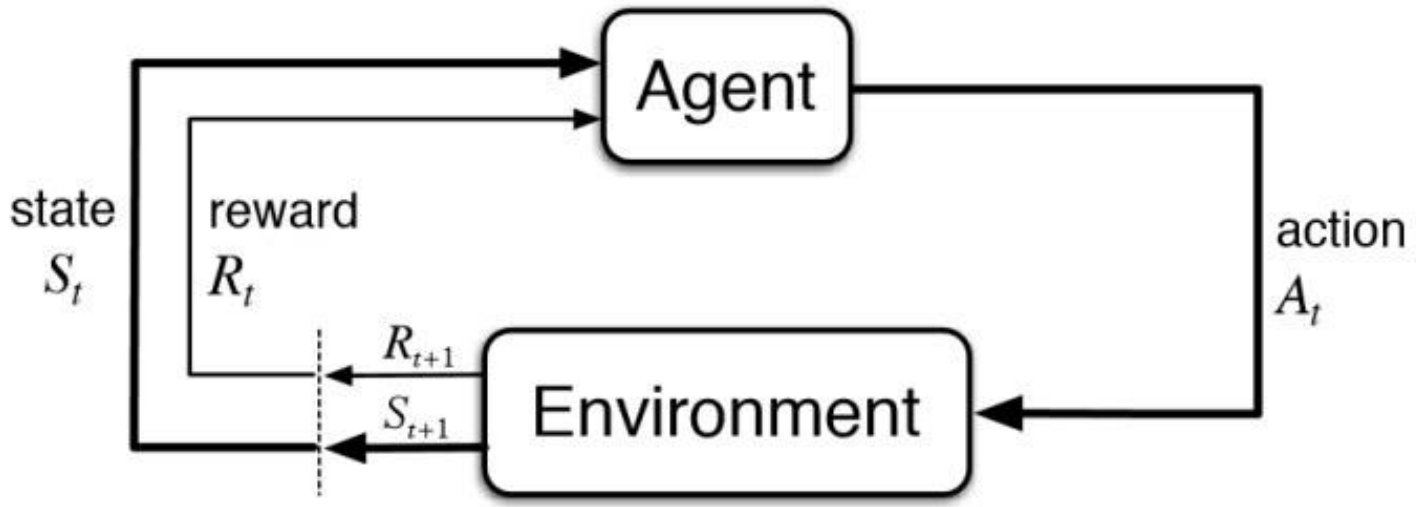
사람이 가보지 못한/못할 길을 먼저 가보는 것



AlphaFold – predict 3D structure of a protein based on genetic sequence

What AI can DO | Search Space | by Reinforcement Learning

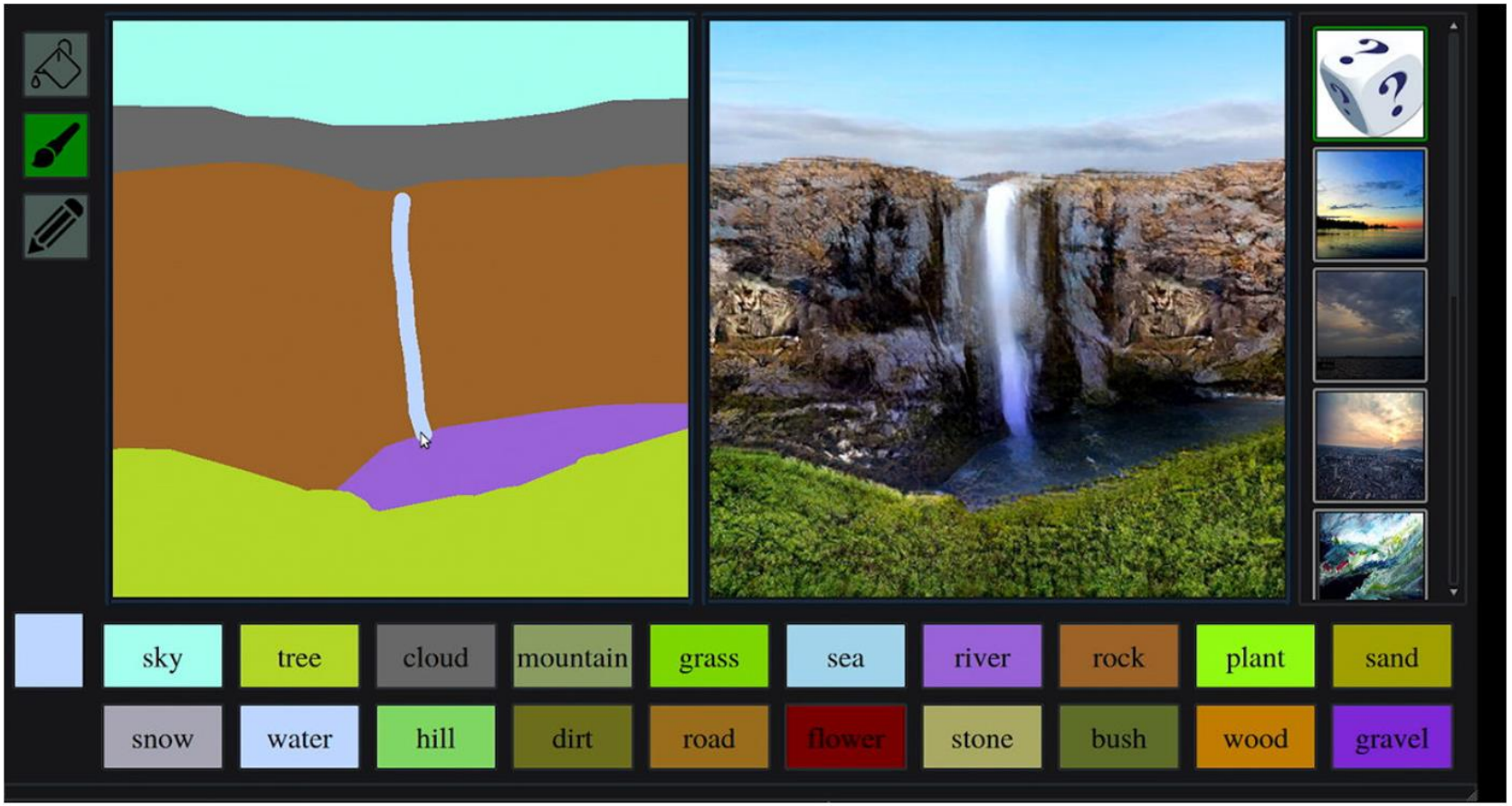
Search Optimal Policy (under ***closed environment***)



사람은 평생 못 볼 데이터를 보고,
유사 데이터 생성

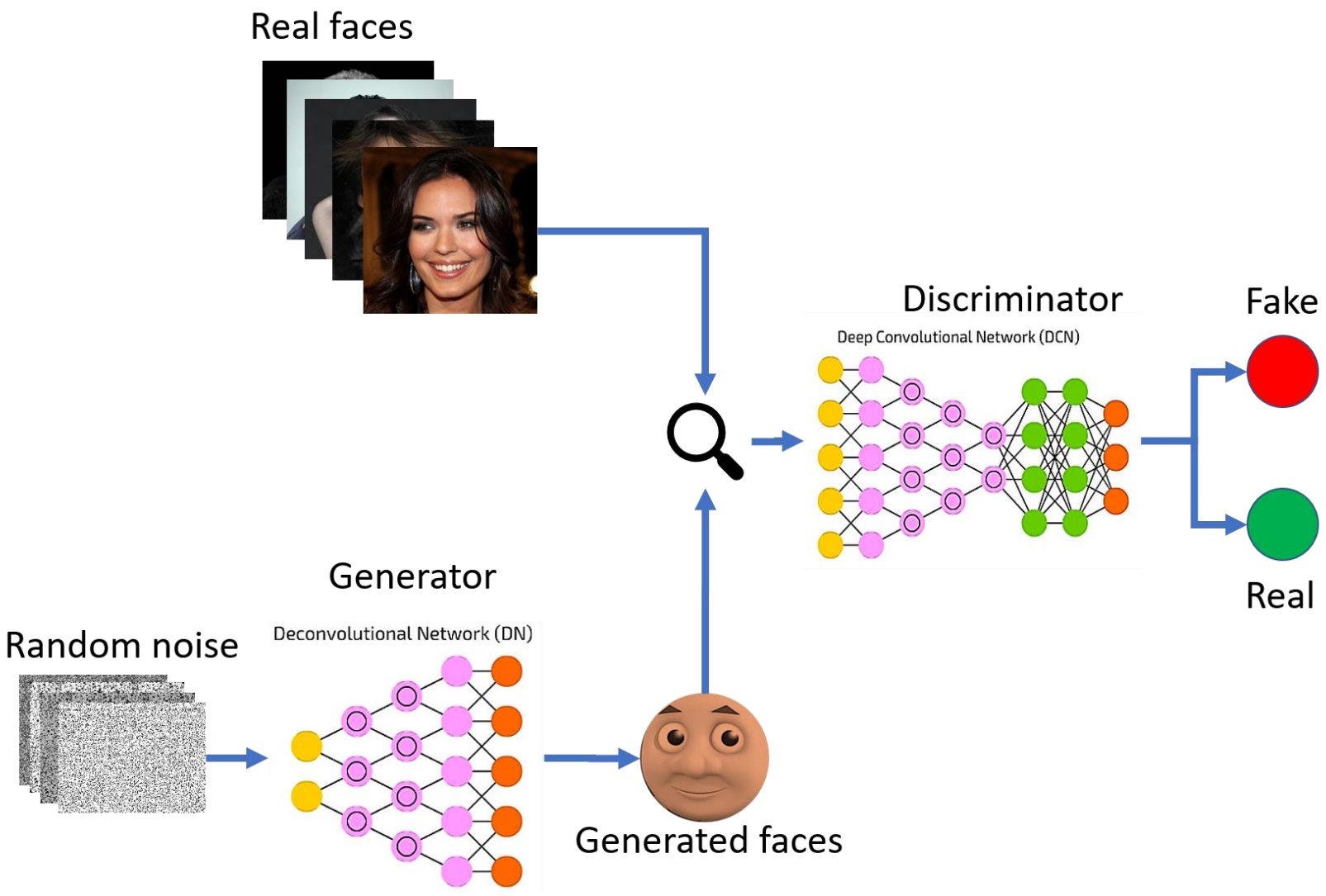
https://youtu.be/kSLJriaOumA

사람은 평생 못 볼 데이터를 보고,
유사 데이터 생성



https://youtu.be/p5U4NgVGAwg

Generative Adversarial Network



https://www.spindox.it/en/blog/generative-adversarial-neural-networks/

Discovered Best Frameworks that AI Works Well (2019)

Classification
trained using tagged data

정해진 답 중 하나를 고르는 것

Representation
something from the massive data

말로 설명할 수 없는 그 무언가를 표현하는 것

Search Space
that is too large for human

사람이 모두 탐색하기에는 너무 큰 공간을 탐색

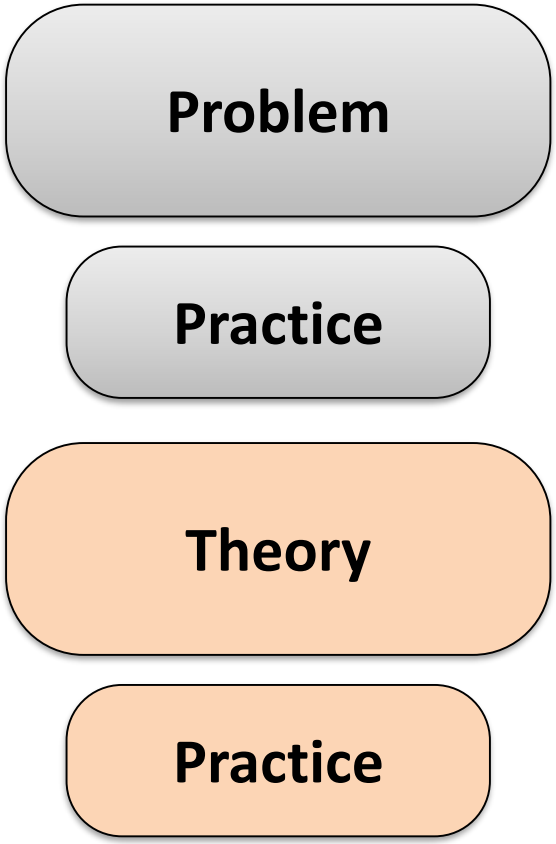
Generate Data
that is very similar real-world data

사람이 구분하지 못할 정도의 유사 데이터 생성

Topic of this semester

SYLLABUS

Course Outline



Goal of the course

After taking this course,

- Students can understand and explain Reinforcement and Generative Learning.

- Students can implement Reinforcement and Generative learning – tasks.

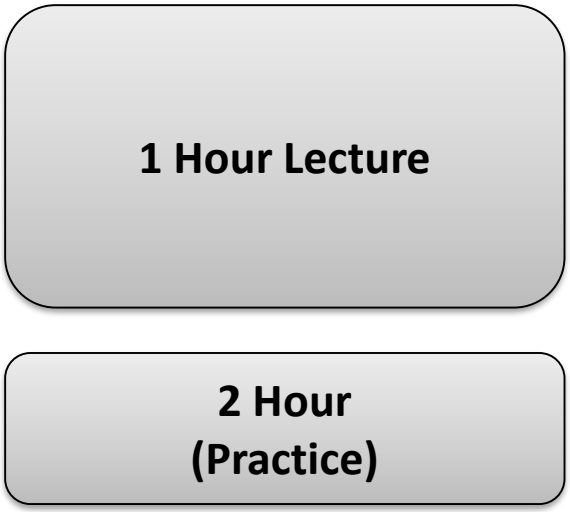
Term Project

- **Pick or assign problems to students**

- **Implement the project and make a presentation**

- **Evaluation will be performed by your model's performance not by the code or theory quality.**

Class



- **Concept & Background**

- **Live Coding**
- **Practice**

All students must bring a notebook.

Evaluation

Assignments : 40%

Attendance : 10%

Term Project: 50%

Contact Information

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