Day 03

AI Marathon - Introduction to AI

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What Is AI?

In 1956, the term Artificial Intelligence was defined by John McCarthy. He defined AI as:

‘The science and engineering of making intelligent machines.’

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Types of learning in AI

1. Artificial Narrow Intelligence(ANI)

2. Artificial General Intelligence(AGI)

3. Artificial Super Intelligence(ASI)

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What is machine learning

Machine Learning is a set of techniques to make computers better at doing things that humans can do better than machines.

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PREDICTION

CONCEPT: predicting(calculating) values based on patterns in data

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Machine Learning is not magic !

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No. of people	Paid for ice-cream
1	10
2	20
4	40

3	?

No. of people	Paid for ice-cream
1	10
2	20
4	40

3	30

No. of people	Paid for ice-cream
1	10
2	20
4	40

3	10

weight → 10

Features Labels

No. of people	Paid for ice-cream
1	10
2	20
4	40

3	30

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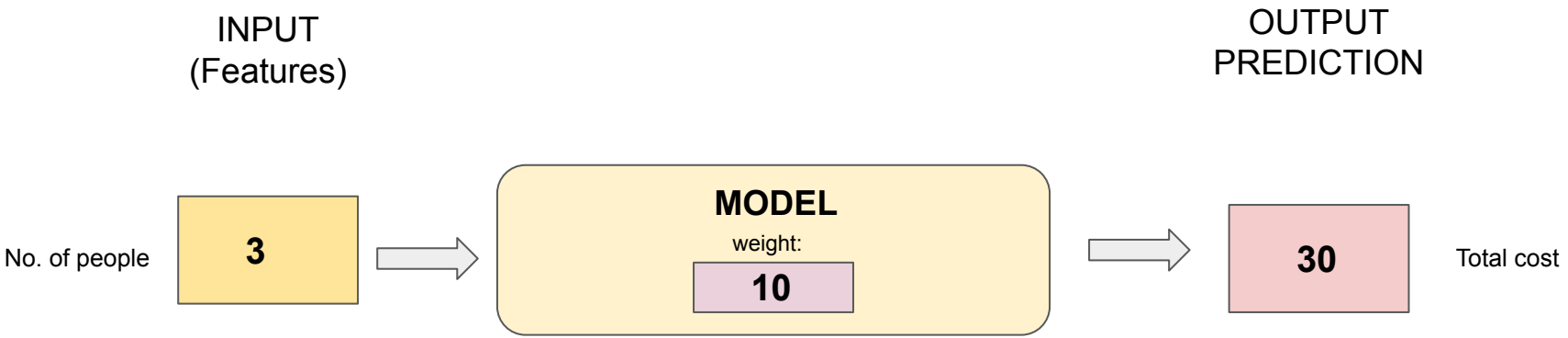
INPUT
(Features)
OUTPUT
PREDICTION
No. of people
3
MODEL
weight:
10
30
Total cost

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Types of machine learning :

- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning

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Supervised Learning

Supervised Learning is basically **“learning with examples”.**

Height (cms)	Weight (kg)	Fitness
150	50	Fit
187	75	Fit
156	80	Not Fit
163	60	Fit
170	49	Not Fit
179	70	Fit

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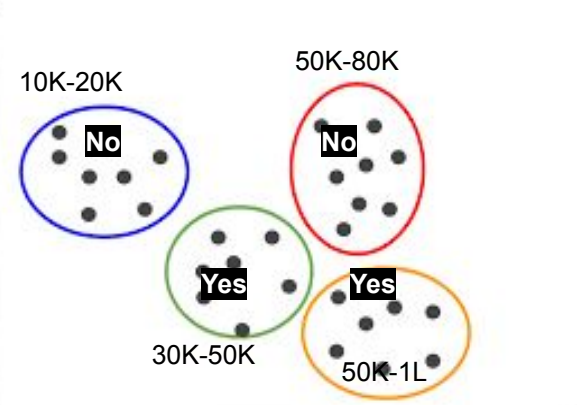
Unsupervised Learning

Unsupervised learning is identifying and learning patterns with only the data.

Name	Loan Amount	Loan Repaid
Ashley	100000	1
Chuck	25000	0
Tim	4000	1
Mike	150000	1
Colin	200000000	0
Libby	400400	1
Sheila	3200	1
Mandi	34850	1
Gareth	6570	0

unsupervised algorithm



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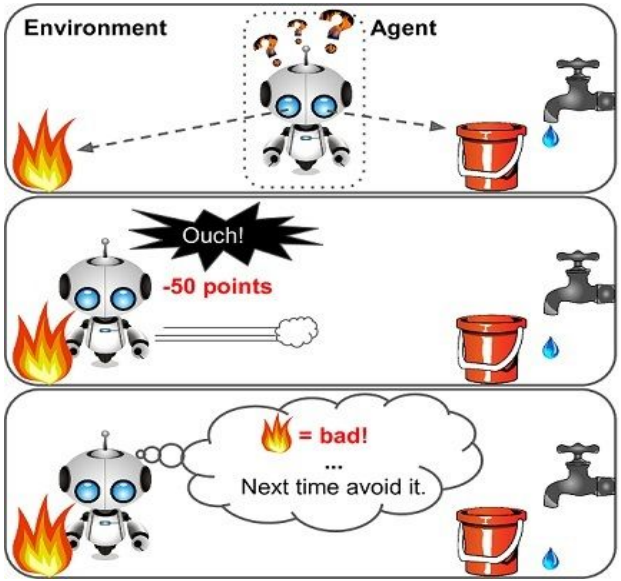
Reinforcement Learning

Reinforcement learning : In the absence of a training dataset, it is bound to learn from its experience



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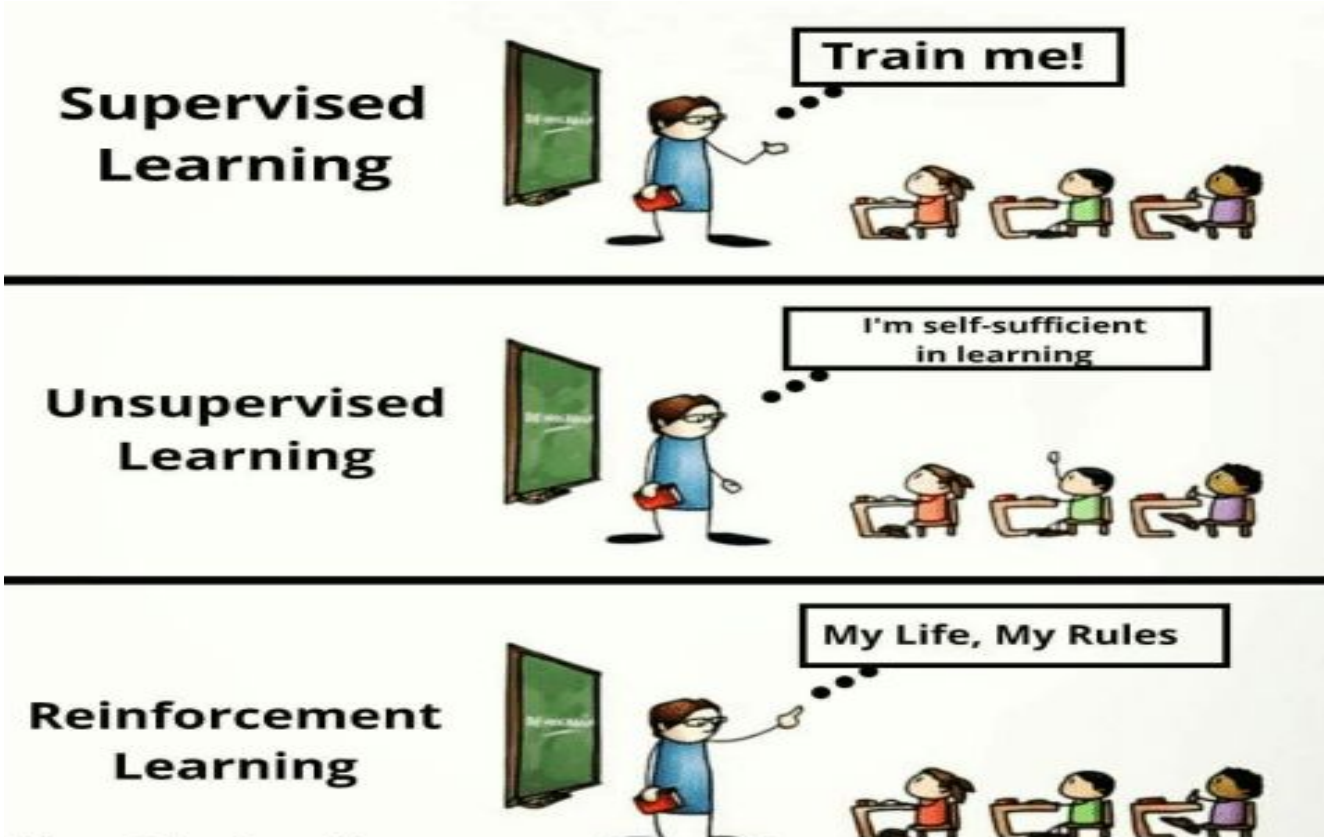

Source: https://me.me/i/machine-learning-guys-%F0%9F%98%82%F0%9F%98%82-32f2e0edc67e45b893b0059888dac9c4

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Classical programming V/S Machine Learning

Write a computer program with explicit rules to follow

```
if email contains V!agrå
  then mark is-spam;
if email contains …
if email contains …
```

Write a computer program to learn from examples

Source: https://mlinproduction.com/machine-learning-is-forcing-software-development-to-evolve/

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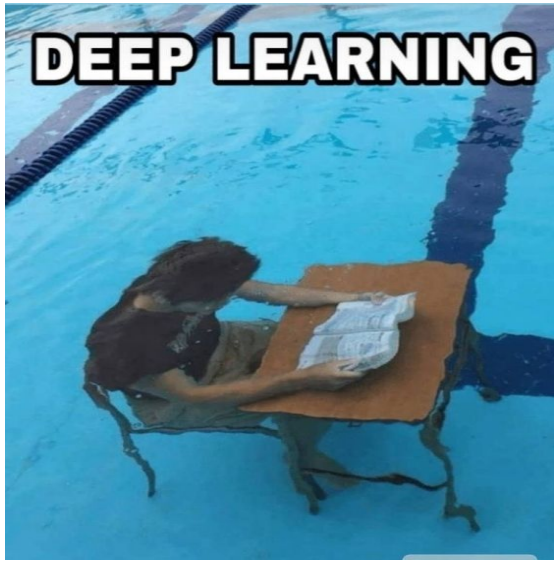
Deep learning

- Deep Learning is a subset of machine learning
- In Deep Learning we will be mostly talking about Neural Networks



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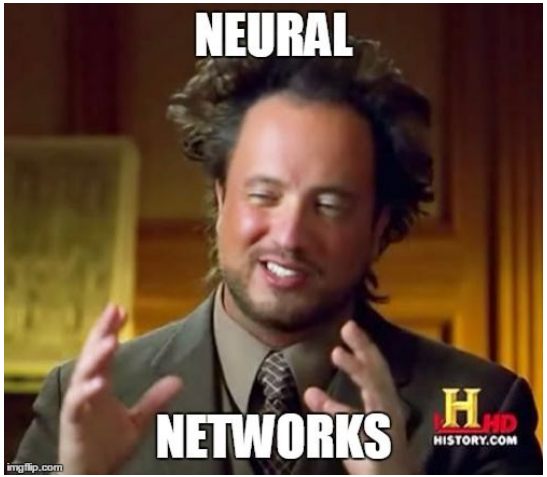
Neural Networks

Neural networks reflect the behavior of the human brain, allowing computer programs to recognize patterns and solve common problems in the fields of AI, machine learning, and deep learning



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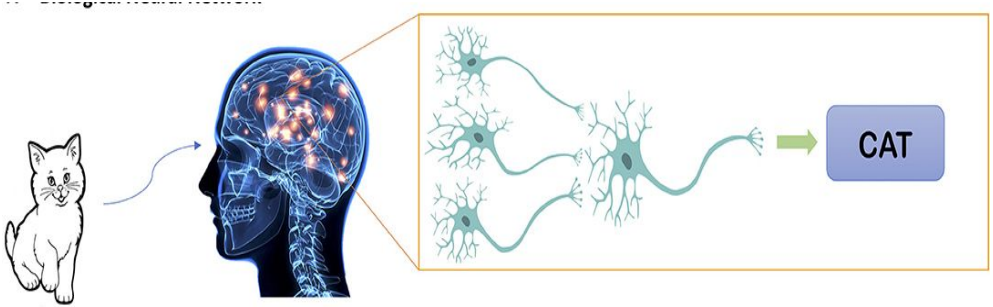
Neural Networks



Biological neural network

computer neural network

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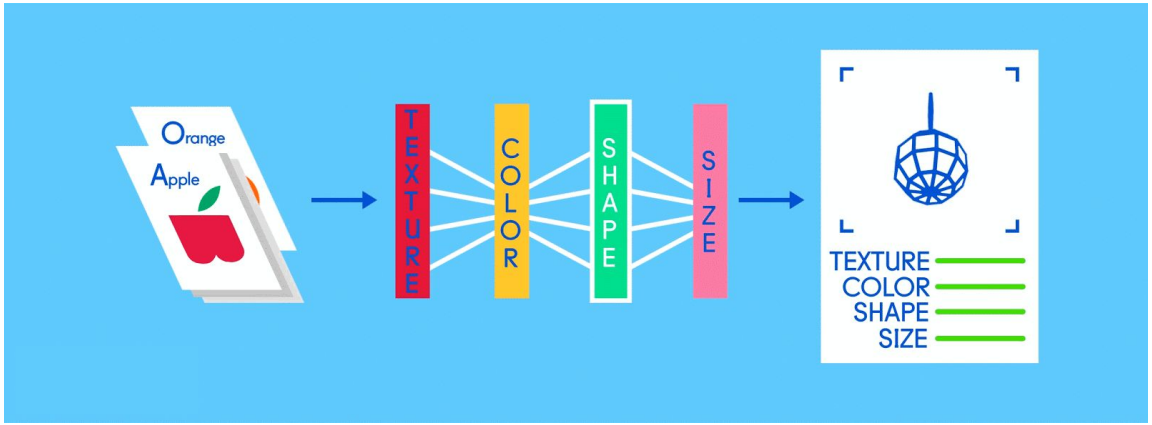
How Do Neural Networks Learn?



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Neural Networks

Some popular Neural Networks are:

- ANN(Artificial neural network)
- CNN(Convolutional neural network)
- RNN(Recurrent neural network)

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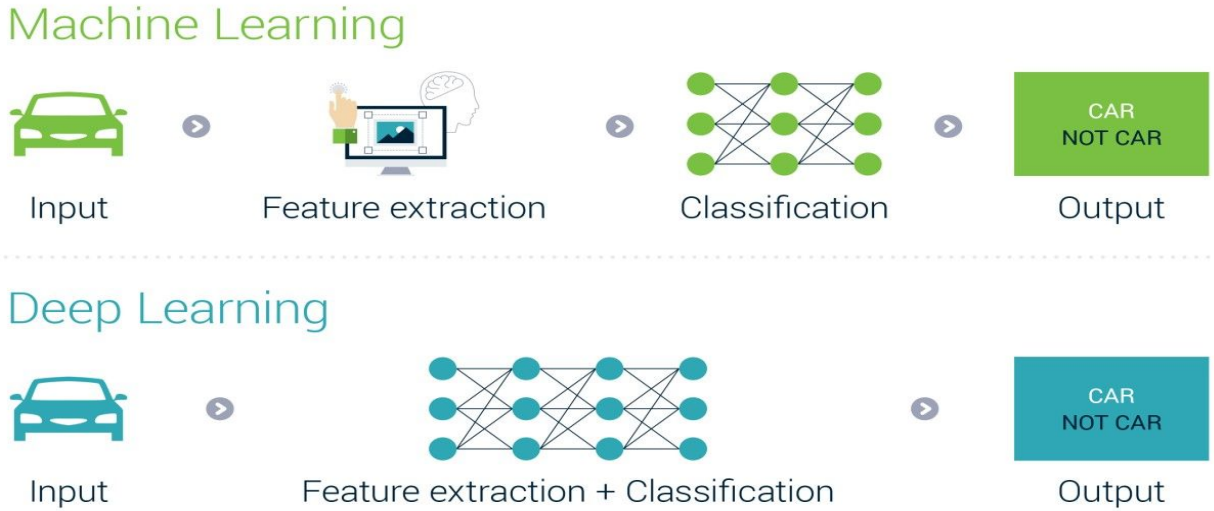
Why Deep learning ?



In deep learning, the algorithm is given raw data and decides for itself what features are relevant

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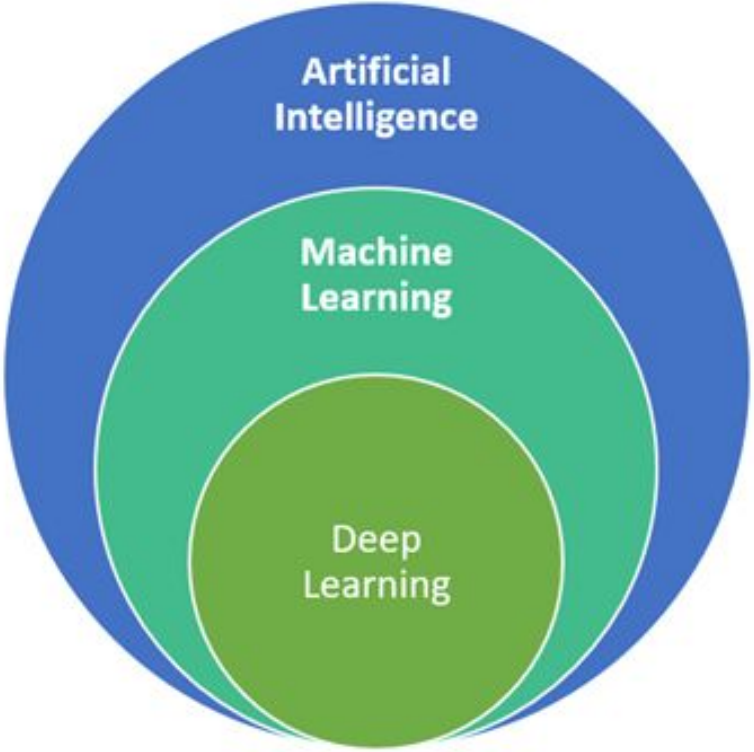

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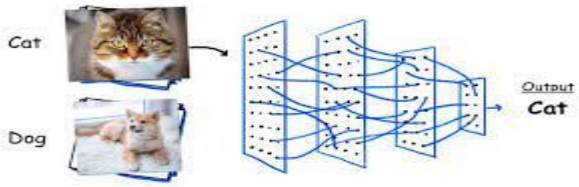
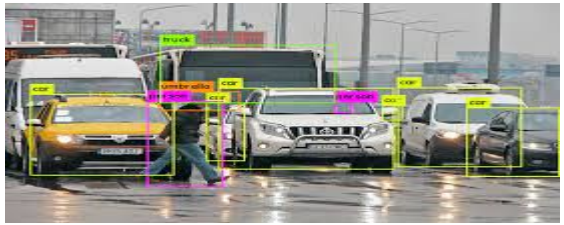
Computer Vision Tasks

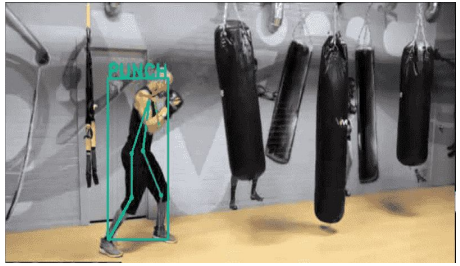


Classification

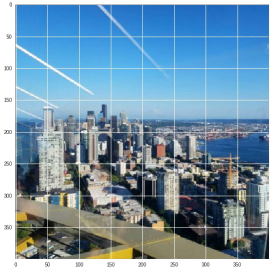


Object detection

Image Segmentation



Activity detection



Creating Art

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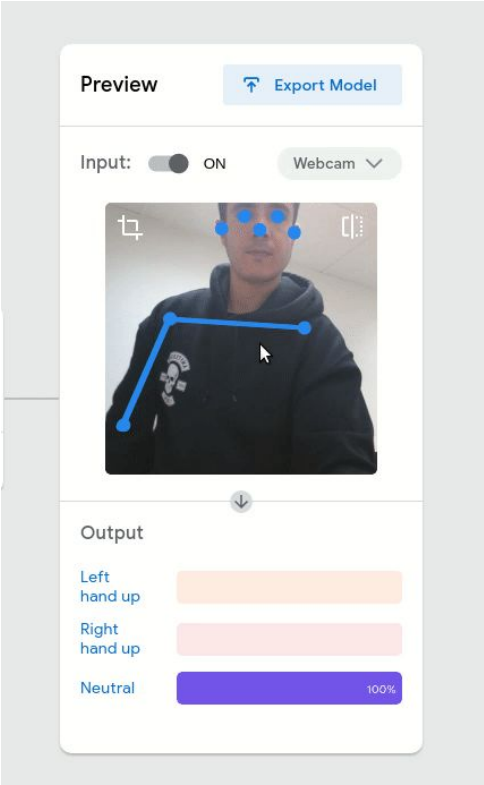
Teachable Machine is a web-based tool from Google that makes creating machine learning models fast, easy, and accessible to everyone

https://teachablemachine.withgoogle.com/train



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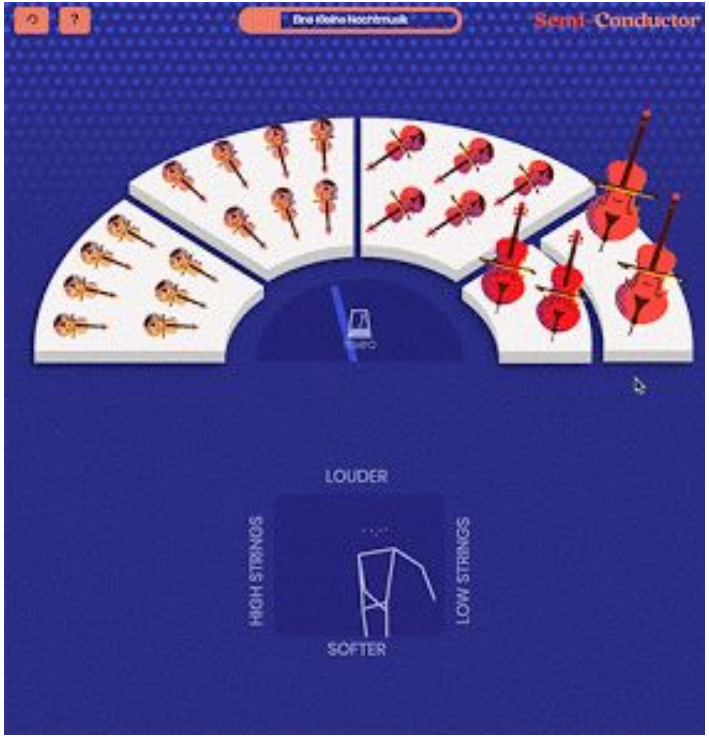
Semi-Conductor allows you to conduct a virtual orchestra using only your web browser & webcam.

Launch Experiment : https://semiconductor.withgoogle.com/

GitHub : https://github.com/googlecreativelab/semi-conductor



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Lets play a Game !!

Which Face is real?

A

B

Source : https://github.com/tkarras/progressive_growing_of_gans

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GANs

- **Generative adversarial networks (GANs)** are an exciting recent innovation in **machine learning**.
- GANs can create new data instances that resemble your training data.
- For example, GANs can create images that look like photographs of human faces, even though the faces don't belong to any real person

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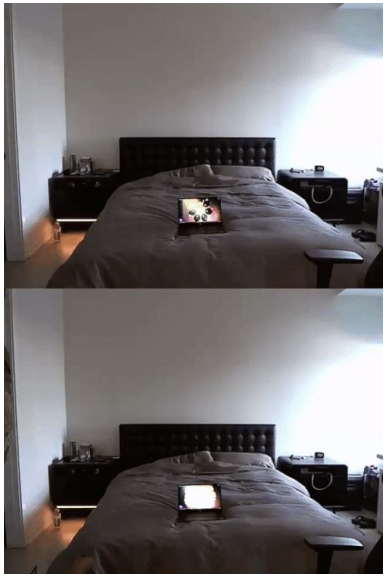
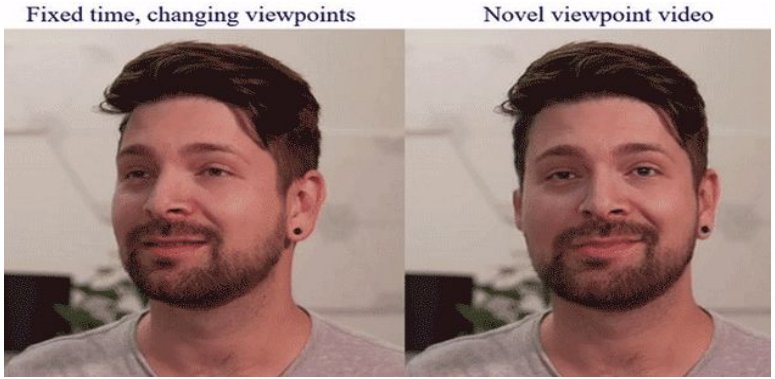


Removing people from complex backgrounds in real time

Demo: https://codepen.io/jasonmayes/pen/GRJqgma



vid2vid-cameo demo

Demo: http://nvidia-research-mingyuliu.com/vid2vid-cameo/

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Natural Language Processing Tasks

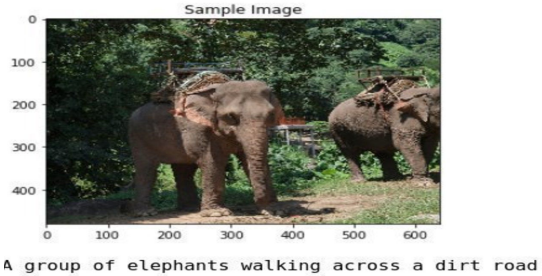
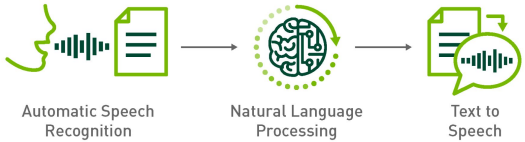
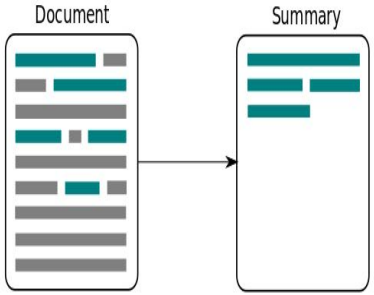


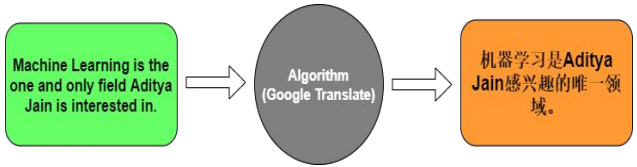
Image captioning



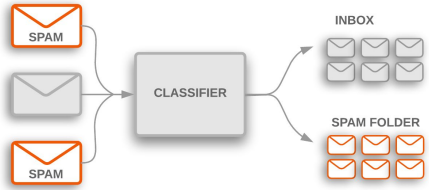
Speech Recognition



Text Summarization



Machine Translation



Text Classification

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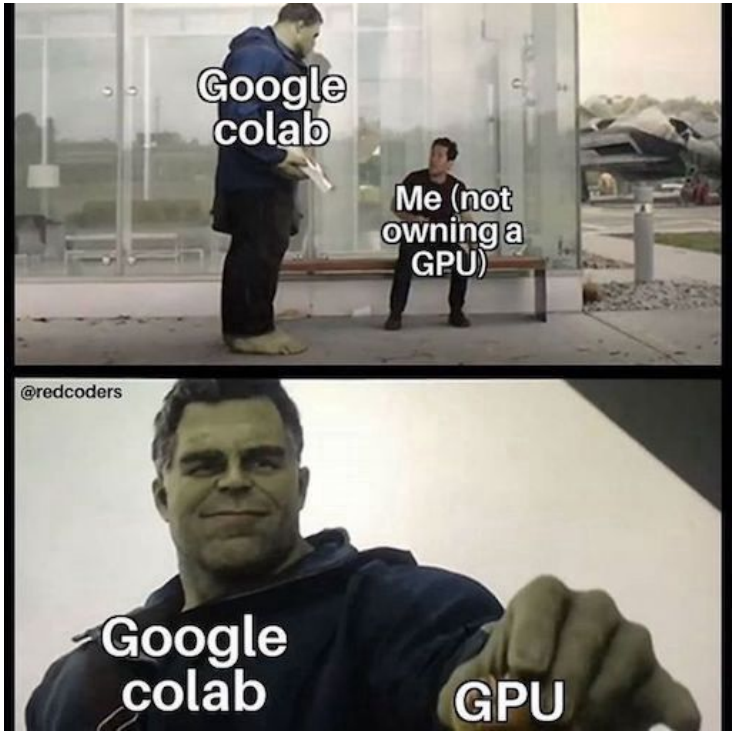
Do you need a powerful machine?



Google Colab: https://colab.research.google.com/

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Let’s play with AI !

NVIDIA AI PLAYGROUND : https://www.nvidia.com/en-us/research/ai-playground/

GOOGLE AI EXPERIMENTS : https://experiments.withgoogle.com/collection/ai

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THANK YOU

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