Introduction to AI & Generative models

Session 1

Who Am I

- Risiing Senior at STEM October.
- Fascinated with AI since the beginning of rising Generative AI models.
- Dealt with the following fields of AI:

o Text generation
o Image generation and AI arts
o Voice and Video models
o AI automation systems
o Constructing self-made AI tools with python scripting

"Artificial intelligence is not a **thread** to humanity, but a **gift** . The only way to appreciate it is to **learn** from it and **collaborate** with it."

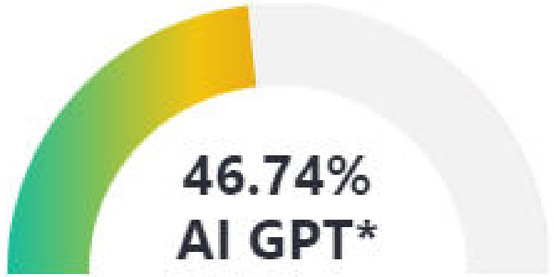
Bing AI

Course Content

Planting AI seeds

- Basic concepts in the world ot AI. (How models work?)
- Mastering prompt engineering for chat GPT

Creative writing
Avoiding AI detection

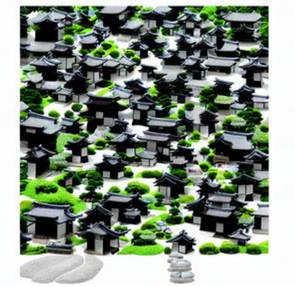


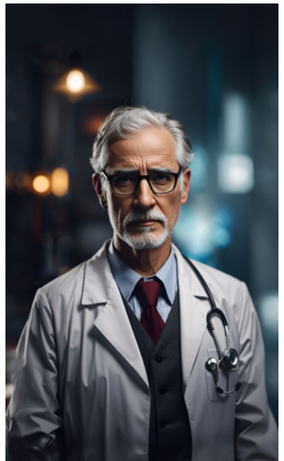
+2000 prompt shared notion

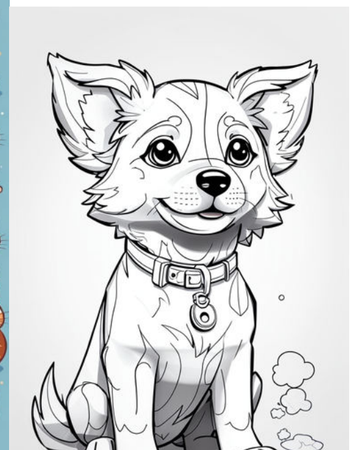
Course Content

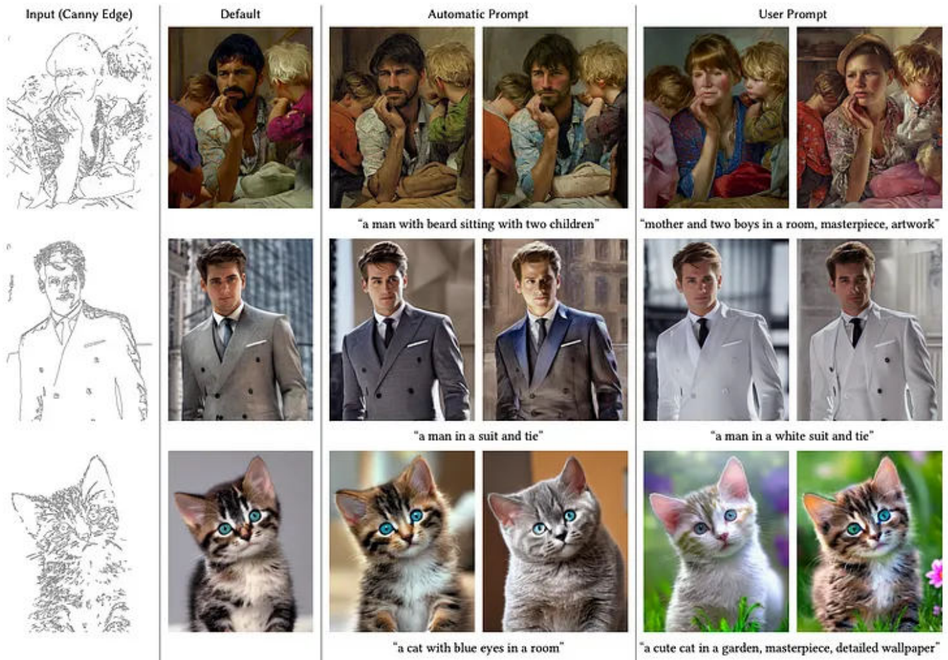
AI arts

- Generating nice looking art works.
- Create your small image gen model
- Turning drawings into art with Control Net.

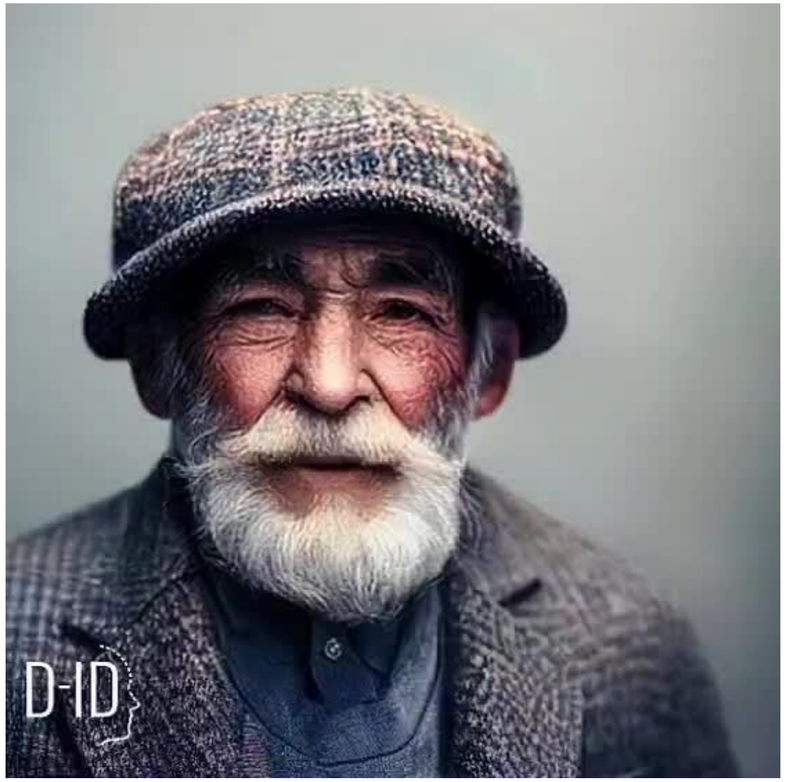








Sessions Time Line



Let AI do the talk

- Video and Voice generation models.
- Generate a talking character with AI
- Create Animations with AI by just voices

Sessions Time Line

Let AI do the talk

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Who Am I

Automate workflows in Applications

Unlocking full powers of AI

Who Am I

Automate workflows in Applications

Unlocking full powers of AI

Add AI tol your programs!

Customizing your own ChatGPT

Integrate ChatGPT with your own programs

Course System

- Attendance
- Projects (Share Your projects within your drive folder!)
- Resources and Content

Share Your creative work with others

Course System

What is AI?

What is Artificial Intelligence?

Developed computer systems that can perform tasks that require human intelligence.

Problem solving, imagination (drawing), writing, coding

First moments of practical AI

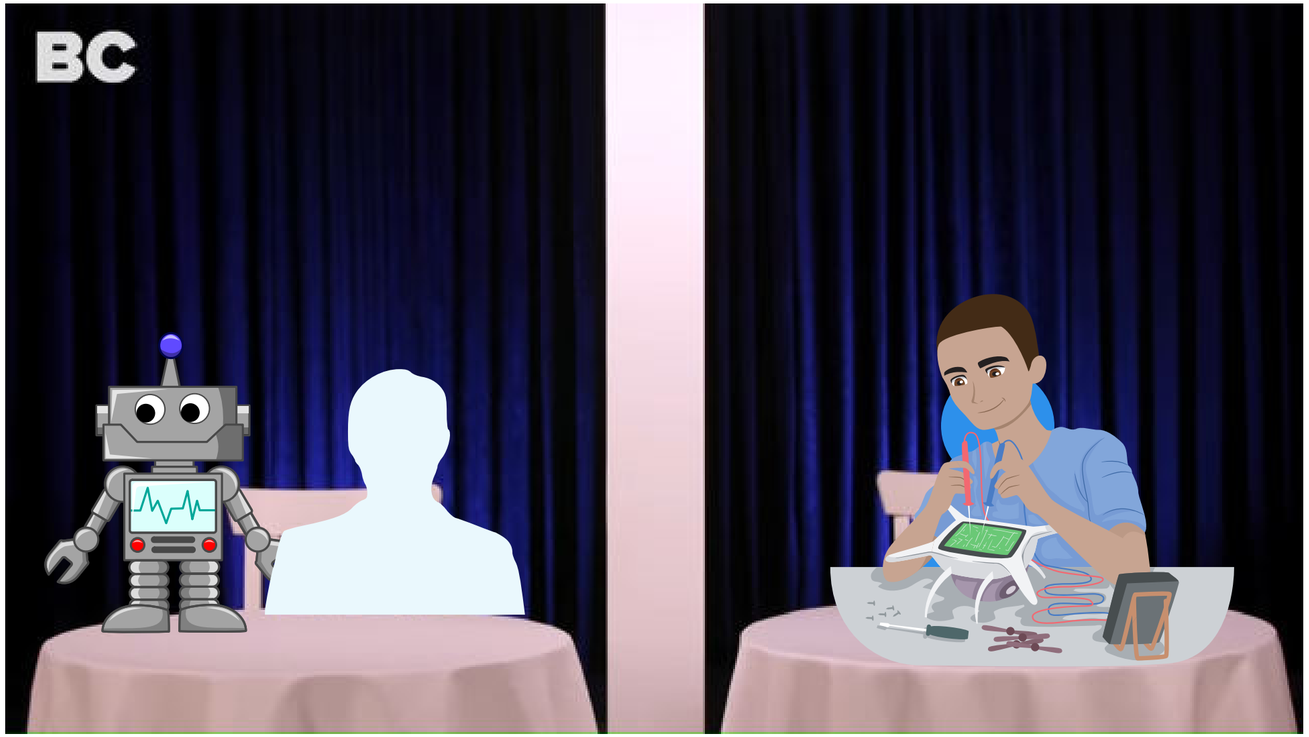
Alan Turing (The Father of Modern Computing)

Can the Machine Think?

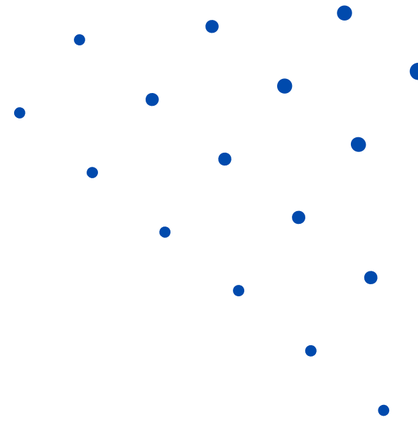
By thuis question, Alan Turing was the first person to start the research of intelligent machines.

*If machines can think, how can they be **tested**?*

Turing Test (1950)

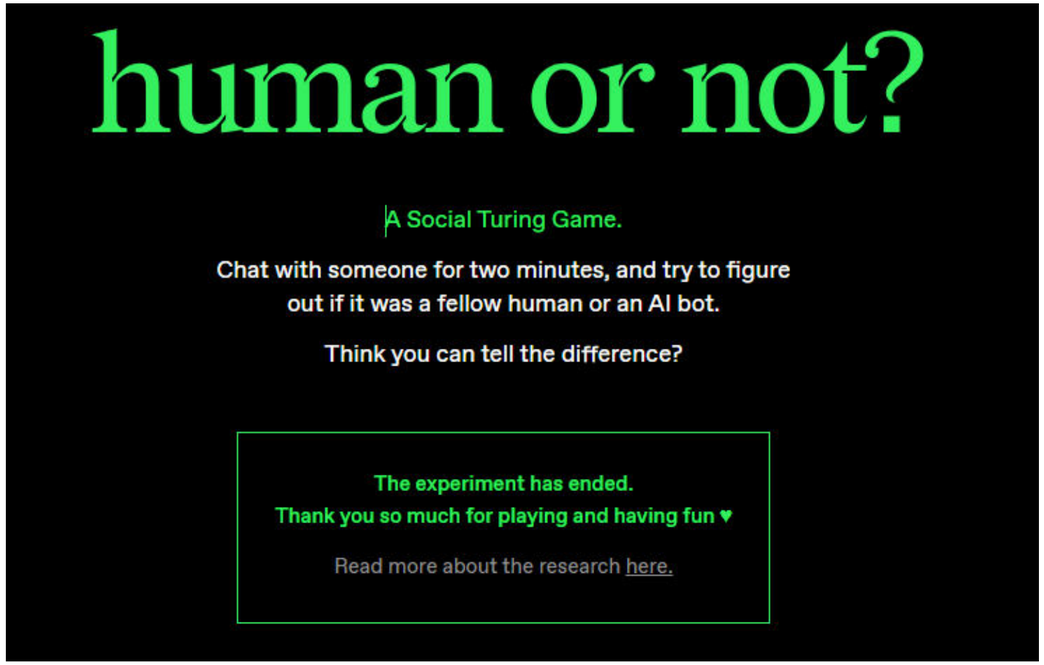


AI wins, if it can generate undistinguished answers as human



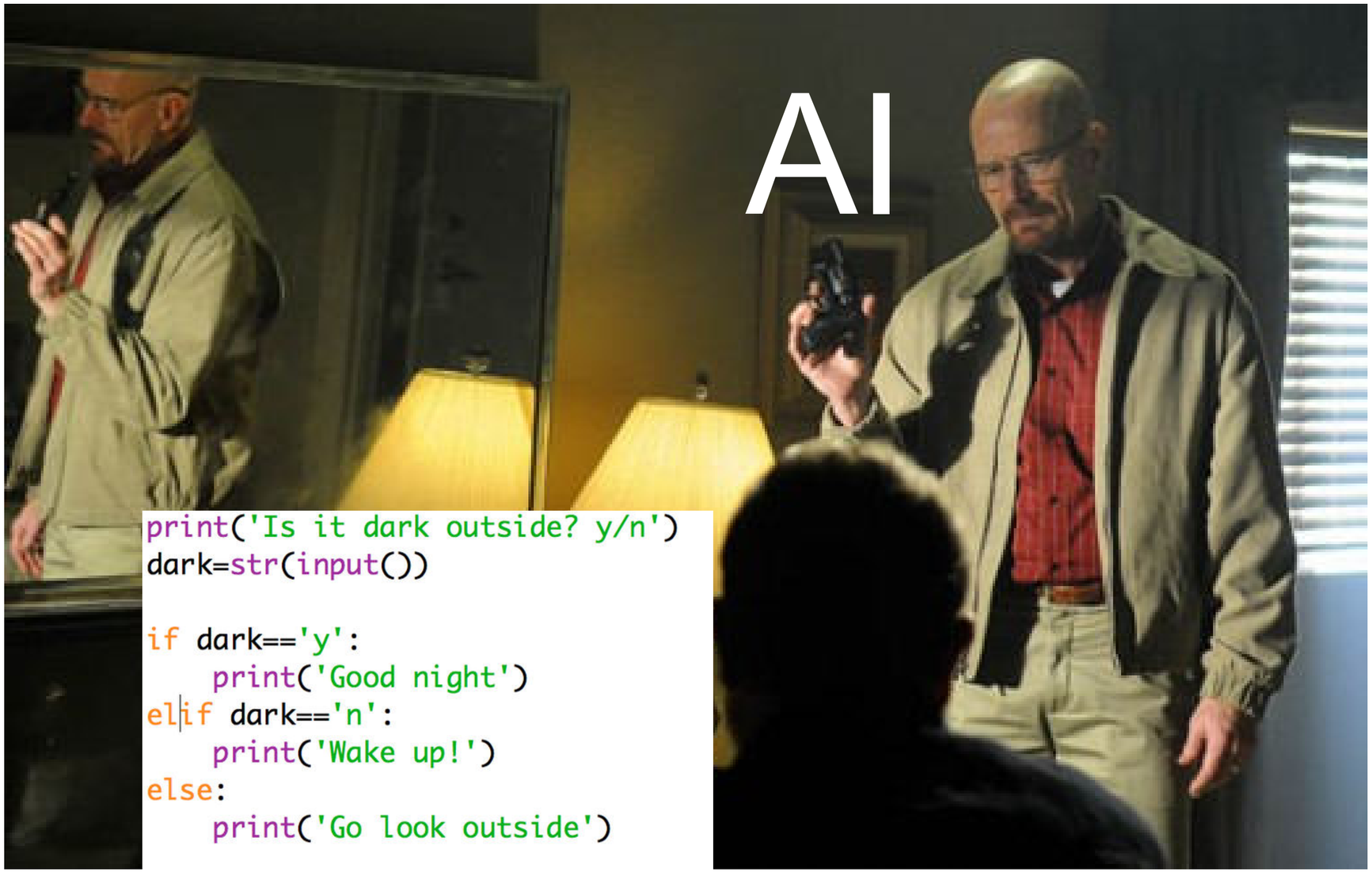
*Turing predicts that by the end of the **20th century**, computers will surely pass the "Turing test."*

Was Turing Right?



When talking to **humans**, participants guessed right in **73%** of the case

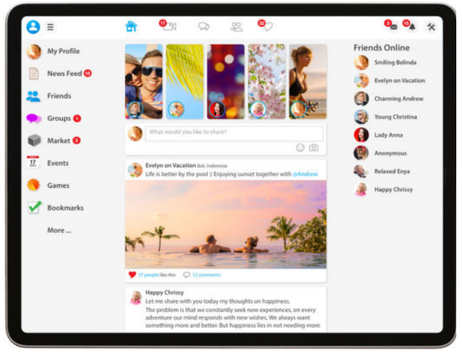
With **AI**, They could guess only **60%** of the cases correctly

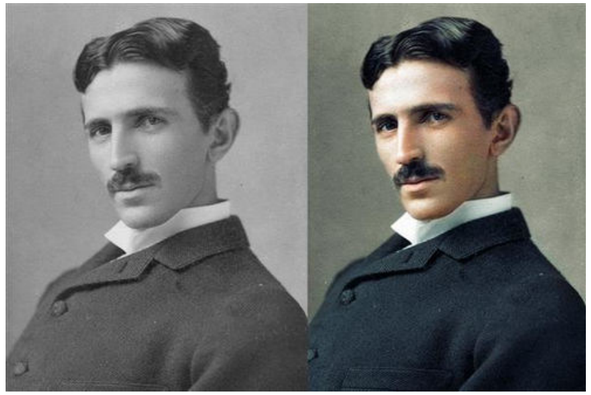

AI
print('Is it dark outside? y/n')
dark=str(input())
if dark=='y':
print('Good night')
elif dark=='n':
print('Wake up!')
else:
print('Go look outside')

What makes AI getting horribly intelligent?

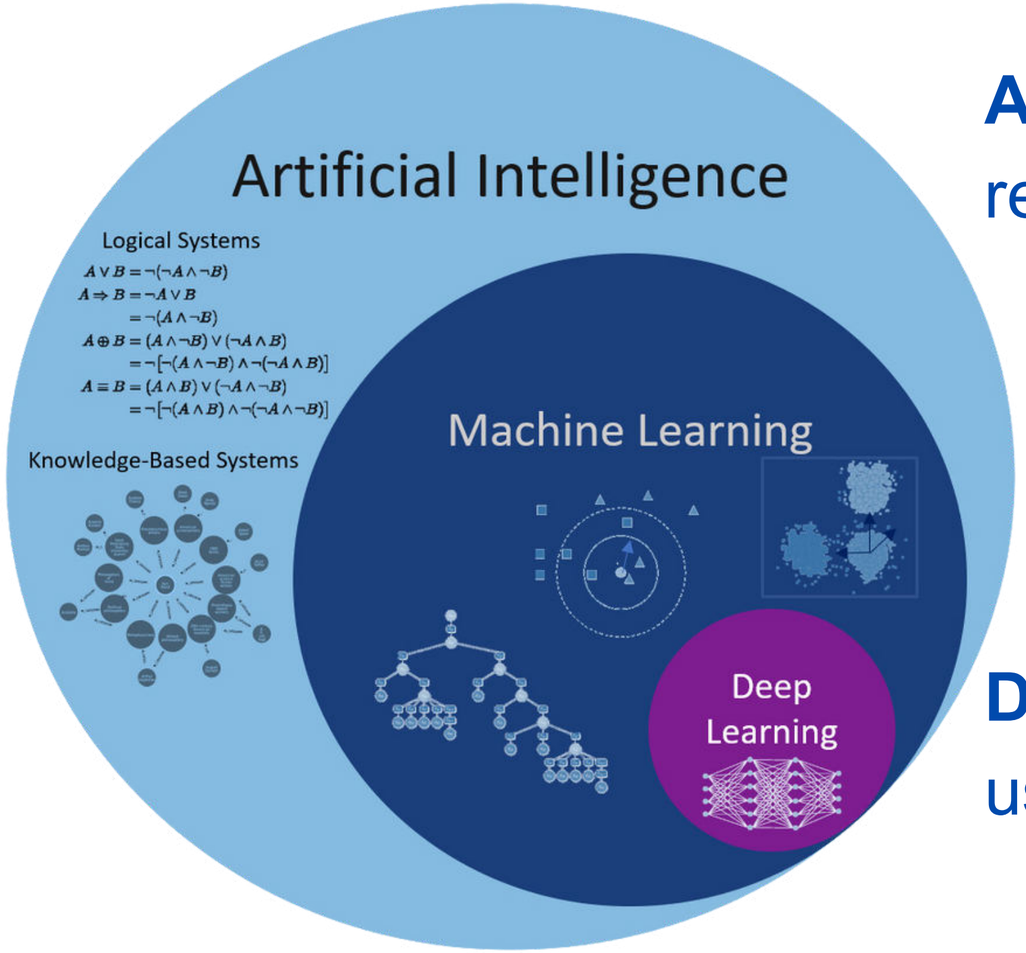
Fields of Artificial Intelligence

Think of These Examples





Fields of Artificial Intelligence



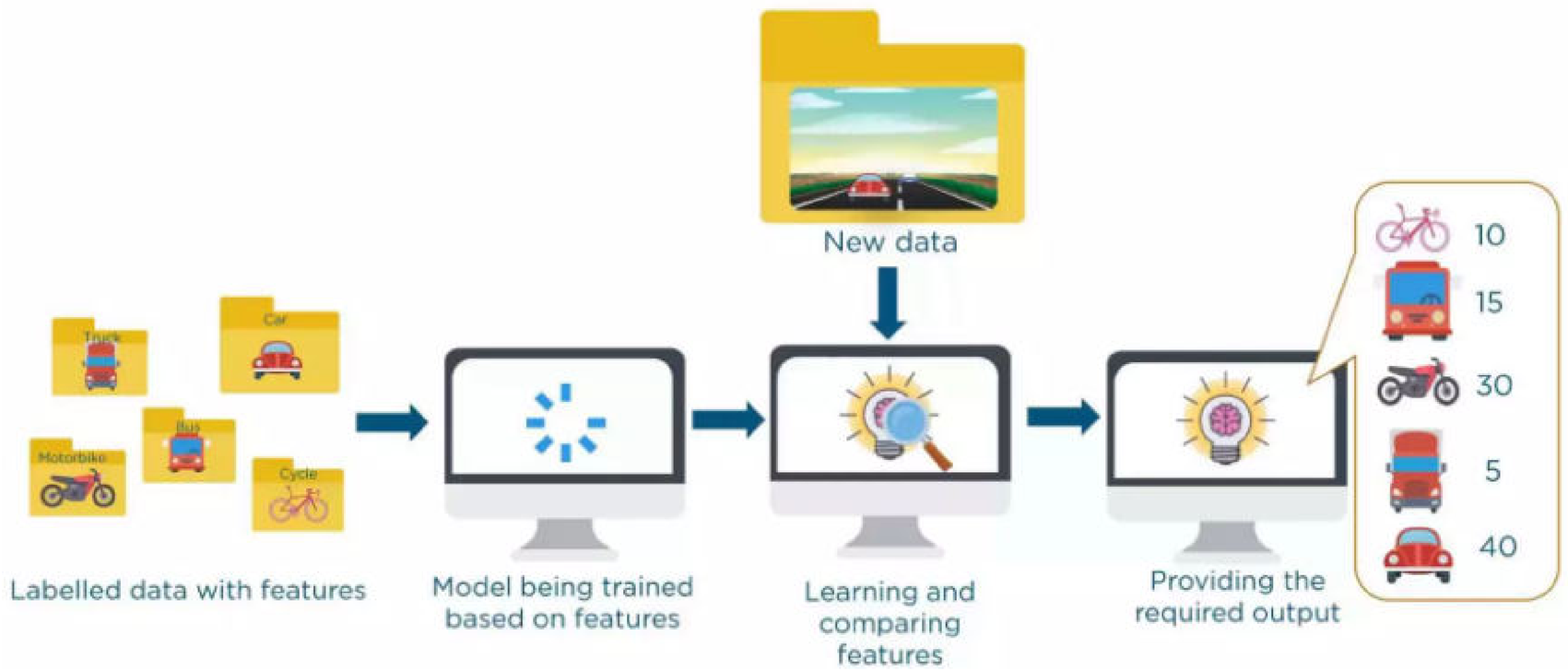
AI: Developed computers can perform tasks requires human intelligent

ML: Systems cana make predictions based on past labeled data

DL: Systems learn and think like humans using artificial inueral networks

Machine Learning

Machine Learning recieve **labelled data with features.** Then Analyse it to predict if the new inputs match **labelled data**

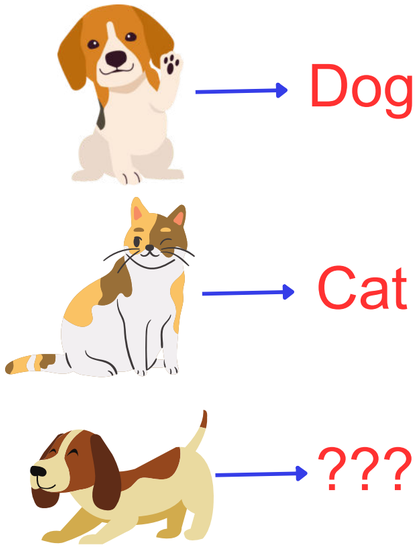


Let's Build your first machine learning model!

Teachable Machine

Types of Machine Learning

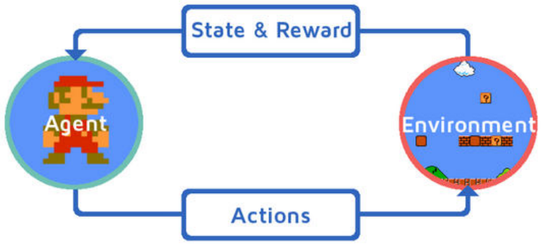
Supervused

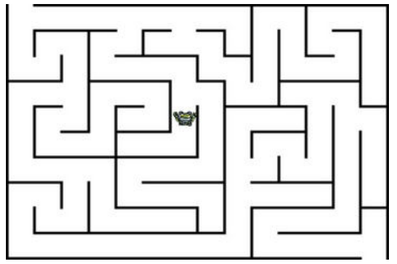


Unsupervised

identify similarities and differences for prediction

Reinfocement





Think...

What Type of machine learning did we use in teachable machine?

Did we provide teachable machine with features of data?

Deep Learning

Deep learning depends mainly on **human nueral networks** which is based on the same nueral networks discovered in human brain.

Santiago Ramón y Cajal (Father of Neuroscience) took the Nobel prize for discovering human brain's internal structure.

He found that human brain tissue consist of small cells called **neurons.**

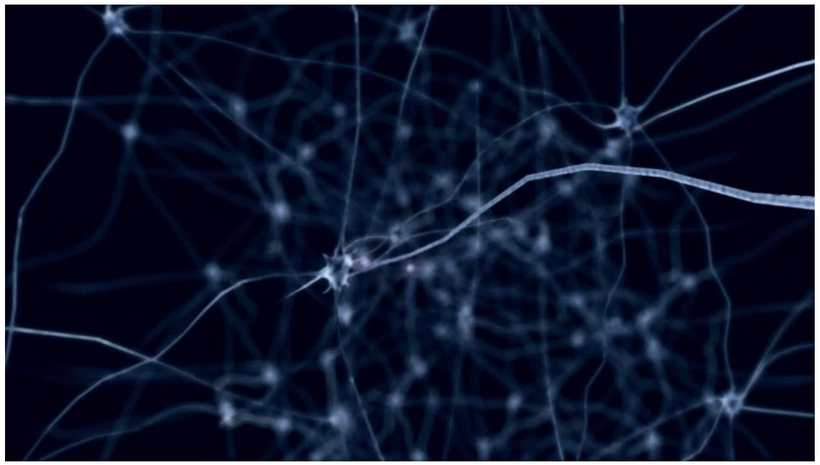
Nuerons take different connections with each other depend on the function they do.

Santiago's drawings of internal brain structure

Deep Learning

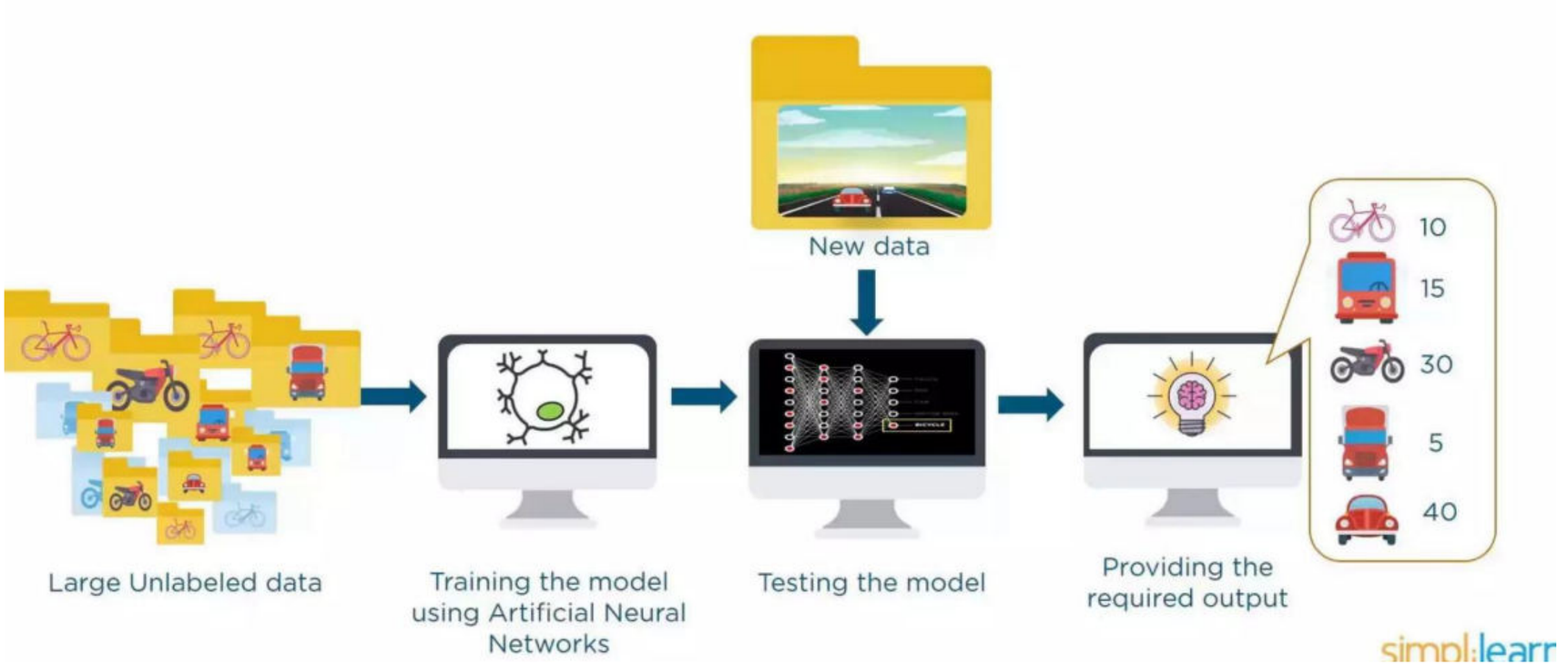
Activation point

Certain condtion lead to transmition of electrical signal to another nueron

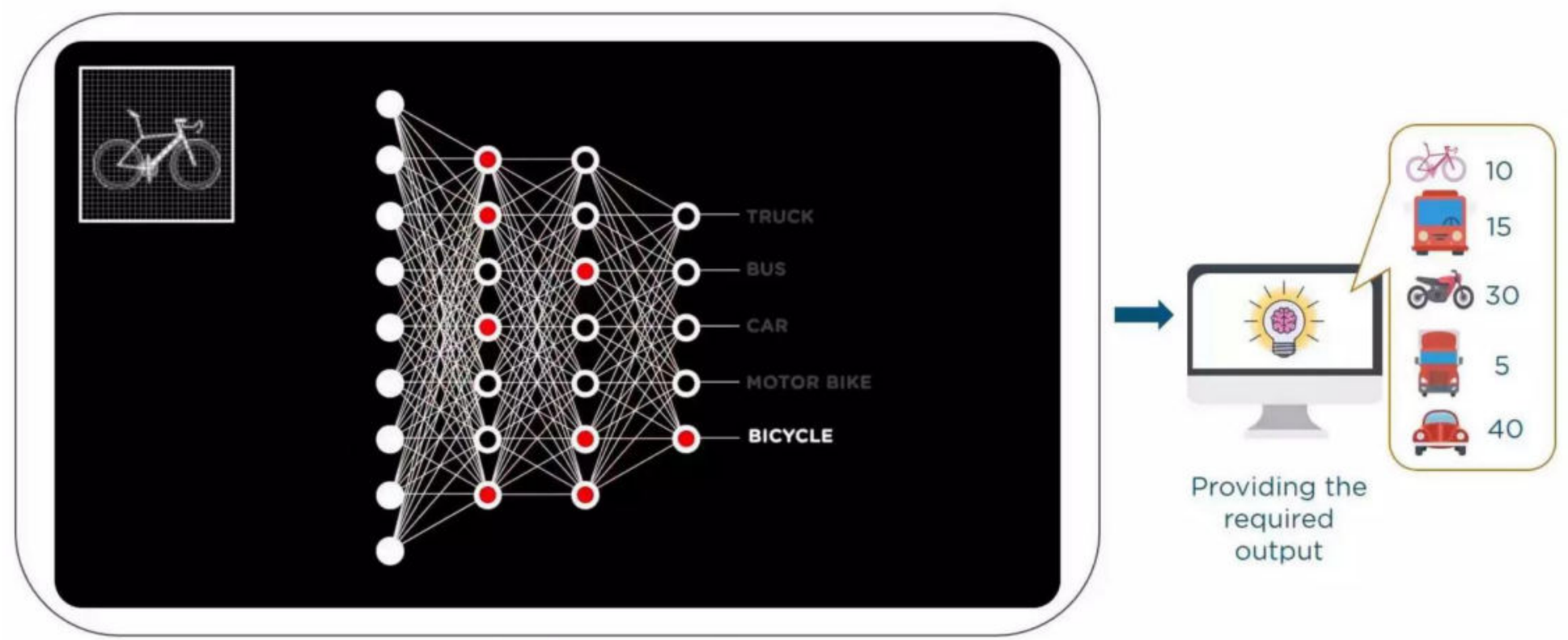


Passing Condition = **Activation**

Deep Learning



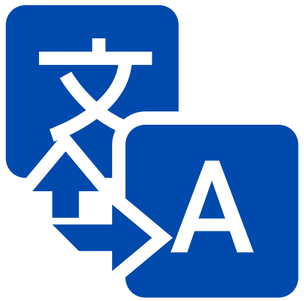
Deep Learning

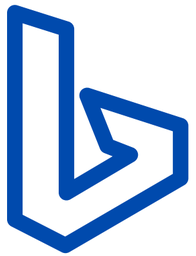


Recurrent Neural Network and Transformers

Let's Try to translate the following!

عايز باب العربية باللون الأسود

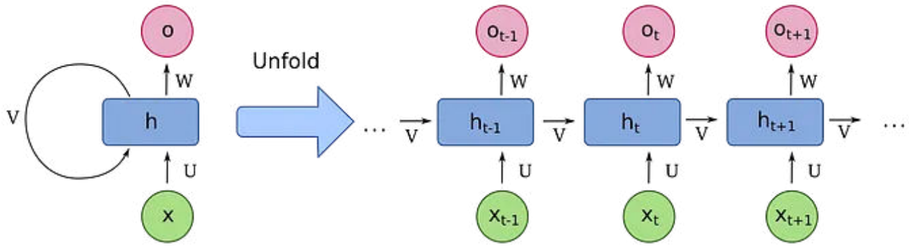




Recurrent Neural Network and Transformers

Deep learning at first was mainly used for translations.

Recurrent Neural Network (RNN)is used for processing sequential text, and speech for Google Translate.



It works as human brain by learning from previous context. (Token after Token)

Can't run in parallelization

Poor Context understanding

Short term memory

Recurrent Neural Network and Transformers

Attention is All you Need!

This paper was published by Google in 2017. It introduced the transformer architecture.

Introduced a structured system can run in **parallelization. Also** it depended **on self attention** mechanism.

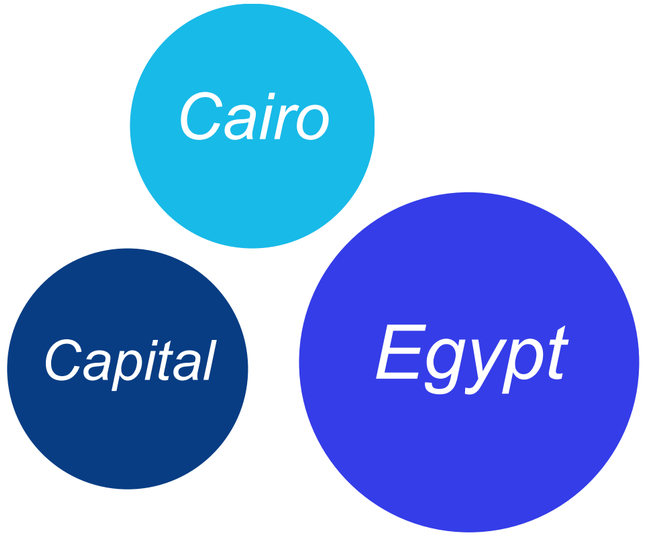
From this paper, the future of AI was reformed for the upcoming decades.

Self Attention

Self Attention works by evaluating high attention scores to most important terms in input.
Then, matches them with the highest attention score from Vector 3d representation of data (Embadding).

What fits the best next?

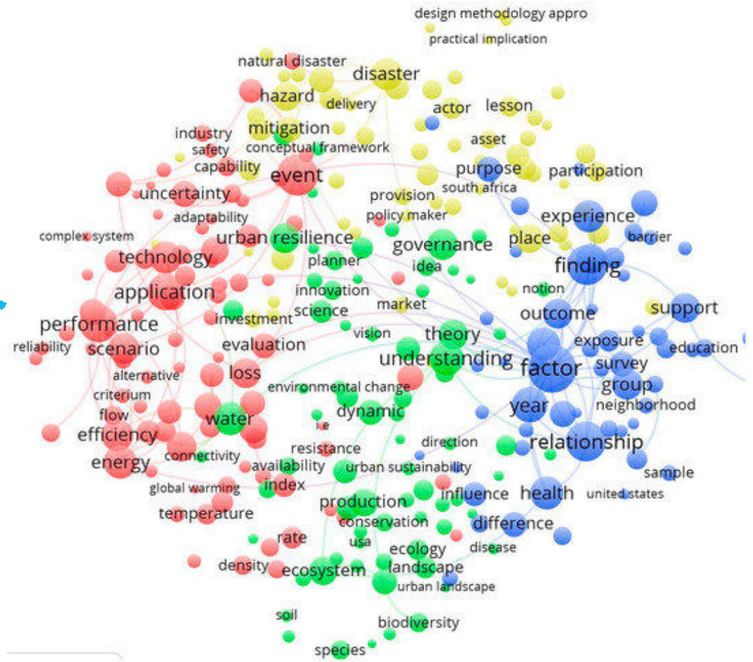
What is the **capital** of **Egypt**?



Pretraining phase of a transformer based model

Pretraining is the process of training model on **large amounts of data**, usually with no labels **(Unsupervised Learning)**; to learn general tasks and features from the data.

Large amounts of data



Congrats!

Now you know what ChatGPT means

Generative

Generate new contet from existing data

PreTrained

Trained on large amounts of articles, books, code from the web

Transformer

Use transformer architicture (Self Attention)

Search Egnines Competition

$162.45 billion
from search ADs

58.1% of google profit comes from its search engine.

Bard AI

Open AI

GPT MODELS COMPARISON CHART

Model	Size	Memory capacity	Accuracy	Input formats	Price
GPT-3	175B	1,500 words	<60%	Text, speech	$$
GPT-3.5		8,000 words	<60%	Text, speech	$
GPT-4	2.7 Trillion	25,000-64,000 words	>80%	Text, speech, image	$$$

greenice

- Bill Gates Challenged Open AI to enhance ChatGPT to make it able to solve **AP Biology test.**
- He expected openAI to take at least **years** to achieve that.

Guess what could it score!!!

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Guess what could it score!!!

59/60

Let's Try
With Bing AI!

Possible Risks

In the next session we will....