

Artificial Intelligence (AI) and ChatGPT Seminar

Outline

1. What is AI?
2. What is ChatGPT?
3. AI and the Future of Jobs
4. AI and Redesigning Education
5. AI Regulations and Their Social Impacts
6. Resources

1. What is AI?

It is software.

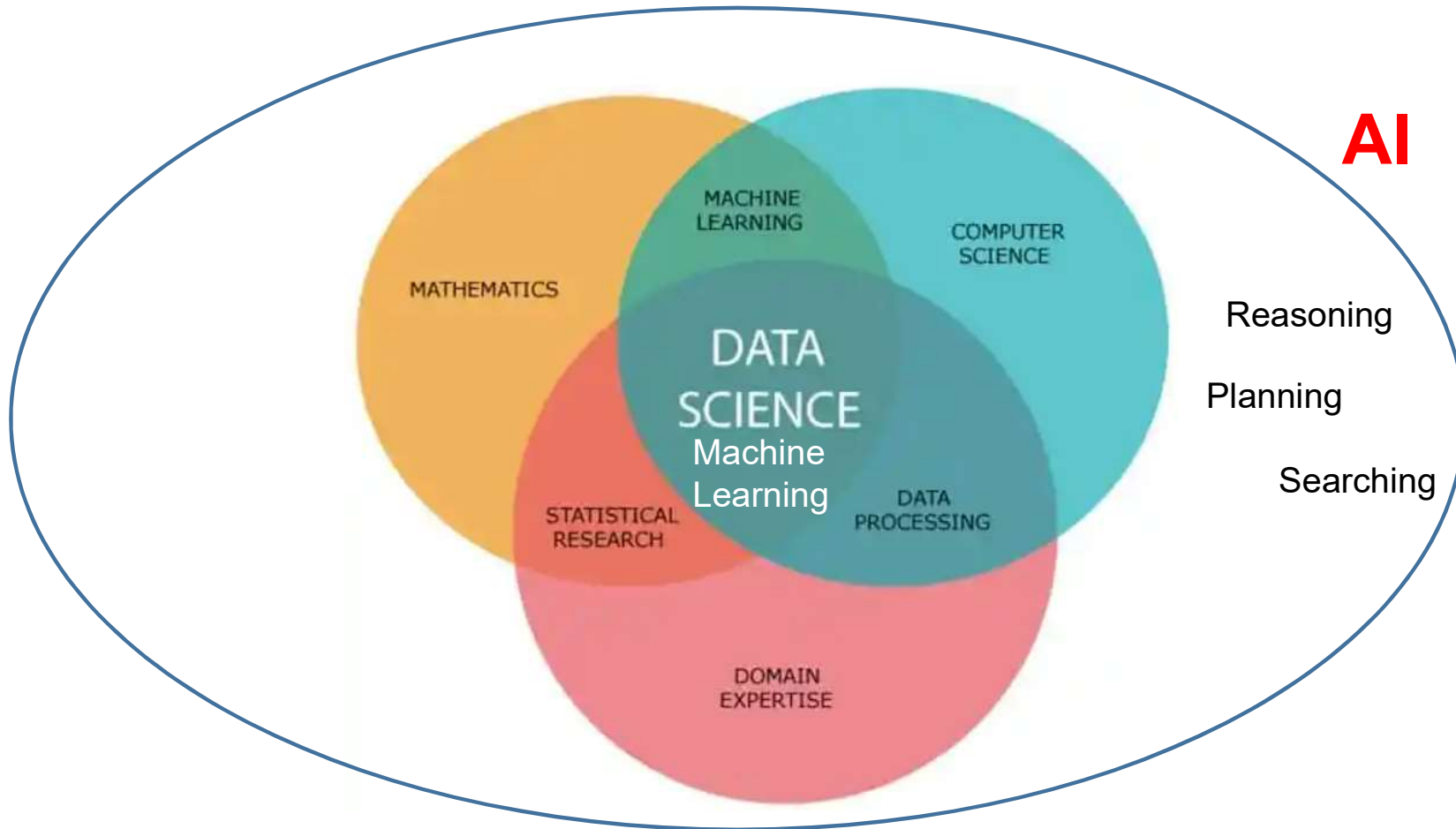
It is a complex decision-making process.

Systems that think and act like humans.

Artificial General Intelligence (AGI)



1. What is AI?



From csitweb.com

1. What is AI?

- We can predict future information from past information
→ Learning from data

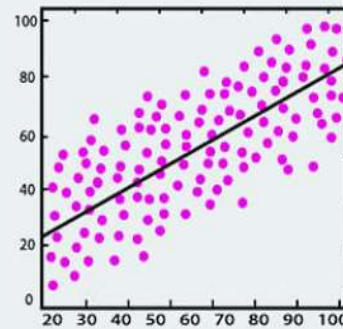
- Clustering, classification, regression analysis

- Some potential keywords for AI:

Smart ...

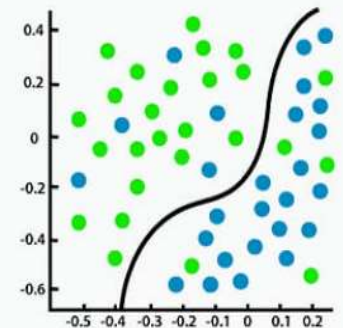
Intelligent ...

Computational ...



Regression

versus



Classification

1. What is AI?

Some of the keywords and titles associated with AI include:

Data Mining

Data Science (DS)

Machine Learning

Big Data

Computational Intelligence

Pattern Recognition

Statistical Learning

Knowledge-based Systems

Learning from data

Computational Intelligence

Data Analytics

Computational Biology/Chemistry/...

Recommender Systems

Expert Systems

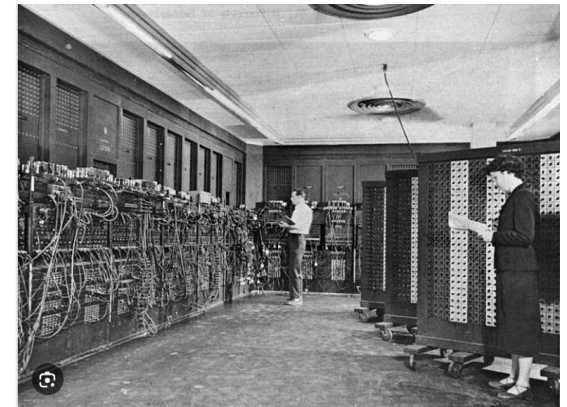
1. What is AI?

A brief history of AI:

- Transistor discovery (1948)
- First computer (1952)
- Alan Turing (English Mathematician, 1940s)
 - Turing Test
 - Enigma machine



Wikipedia



History of computing hardware - Wikipedia

The Turing Test

Computing Machinery and
Conditions for considering a machine

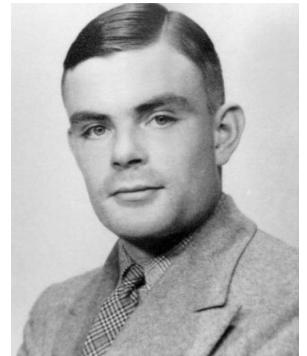
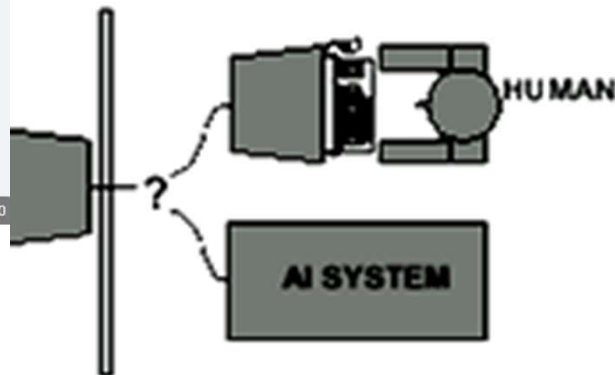
“Can machines behave intelligently?”

(in Game): Operational definition of



1.200 x 1.200

World War II Enigma Machines - Antique Trader



Alan Turing,
English
Mathematician
1940s

**He is inventor
of computer,
Turing Machine
and AI**

1. What is AI?

Do we use AI in our daily life? → Yes.

Recommender systems (Amazon, Mobile phone, ...)

Face recognition, fingerprint recognition, ...

Medical science

Business

Finance

Supply chain management

...

1. What is AI?

Application domains of AI:

Computer vision

Natural language processing (NLP)

Text mining

Medical science/Bioinformatics/Healthcare/Drug discovery

Finance

Business

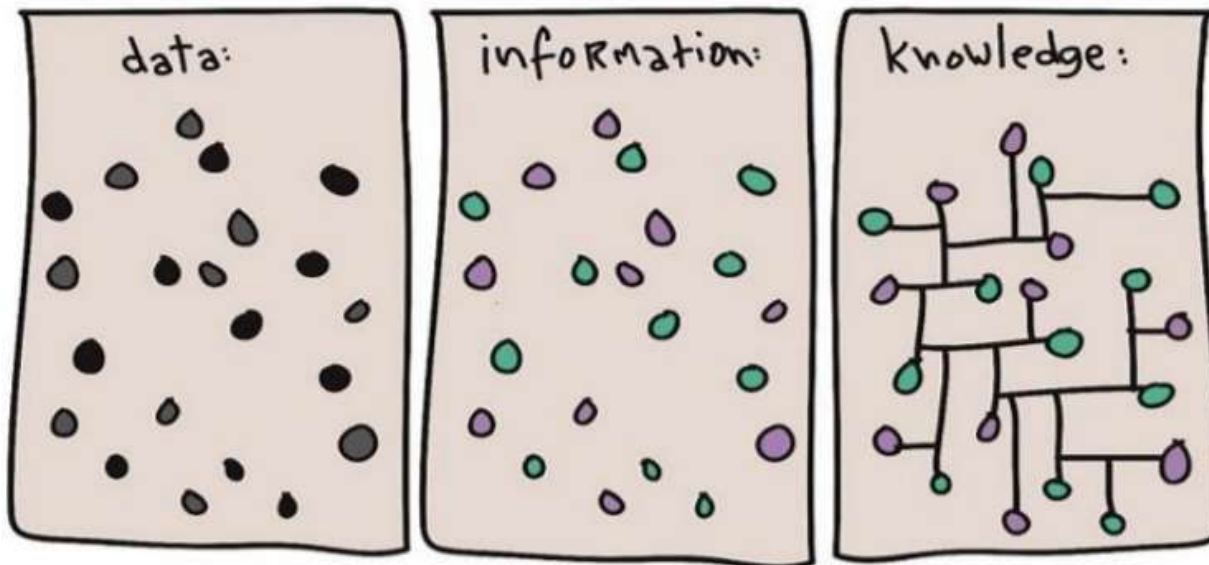
Brain-inspired chips/computing: Neuromorphic Computing, AI hardware implementation

...

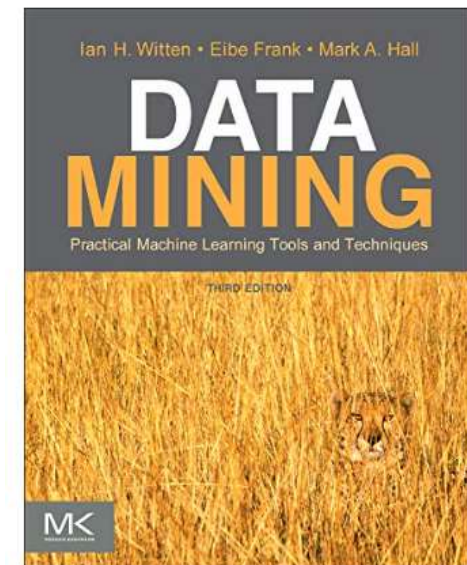
1. What is AI?

Our job is to find relationships in data.

Finding relationships:

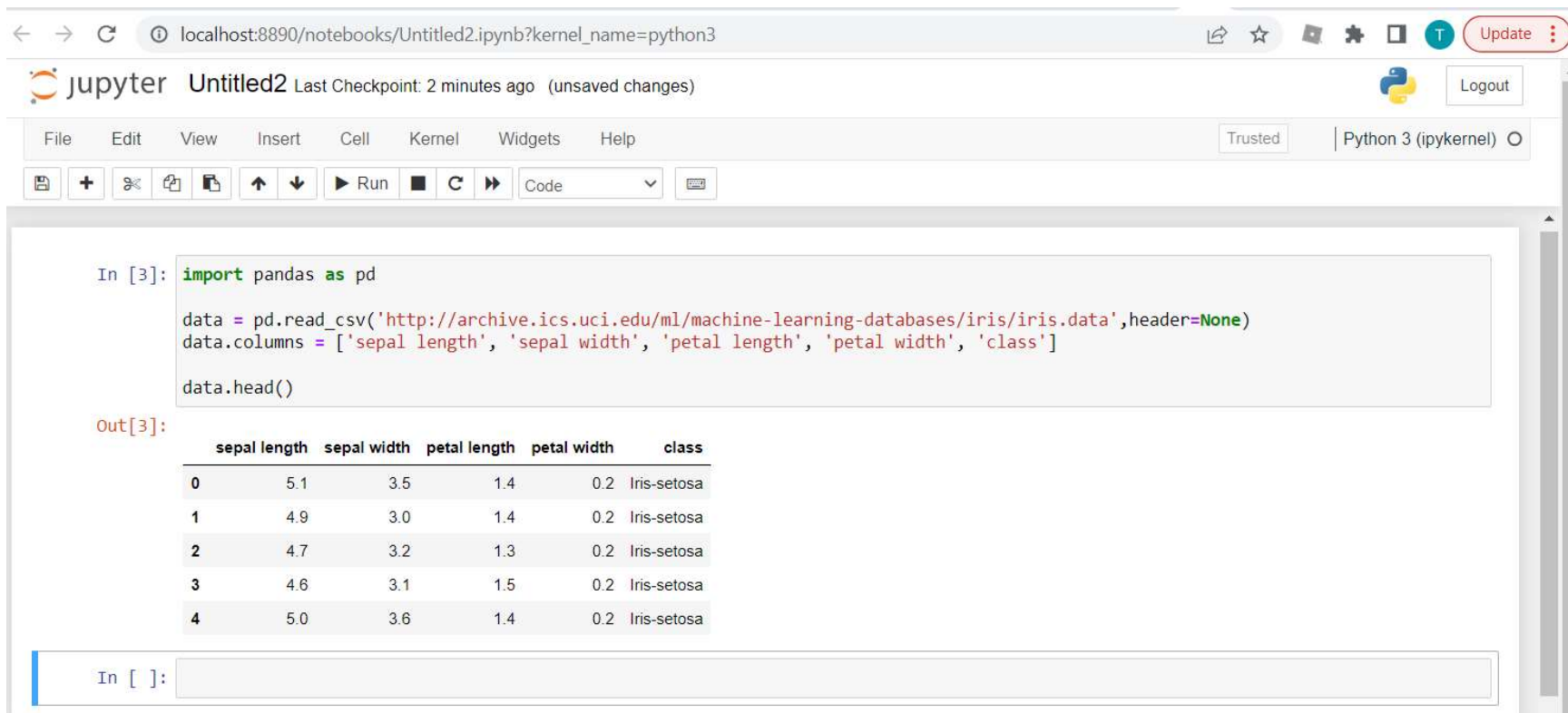


Finding visual relationship: Lion



1. What is AI?

Example: Download the Iris data set from the UCI machine learning repository (online). Use Pandas to read the CSV file and store them in a DataFrame (DF) object named data. Display the first few rows of the data frame.



The screenshot shows a Jupyter Notebook interface in a web browser. The browser address bar shows the URL: localhost:8890/notebooks/Untitled2.ipynb?kernel_name=python3. The Jupyter Notebook title is "Untitled2" and it indicates "Last Checkpoint: 2 minutes ago (unsaved changes)". The interface includes a menu bar with options: File, Edit, View, Insert, Cell, Kernel, Widgets, Help. Below the menu bar is a toolbar with icons for file operations, a "Run" button, and a "Code" dropdown menu. The main area of the notebook contains a code cell with the following Python code:

```
In [3]: import pandas as pd

data = pd.read_csv('http://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data',header=None)
data.columns = ['sepal length', 'sepal width', 'petal length', 'petal width', 'class']

data.head()
```

The output of the code cell is displayed as a table:

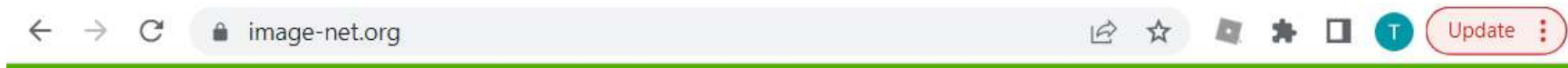
```
Out[3]:
```

	sepal length	sepal width	petal length	petal width	class
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa

At the bottom of the notebook, there is an input field for the next code cell, labeled "In []:".

1. What is AI?

ImageNet data set (Over the 14 million images from the life):



IMAGENET

14,197,122 images, 21841 synsets indexed

[Home](#) [Download](#) [Challenges](#) [About](#)

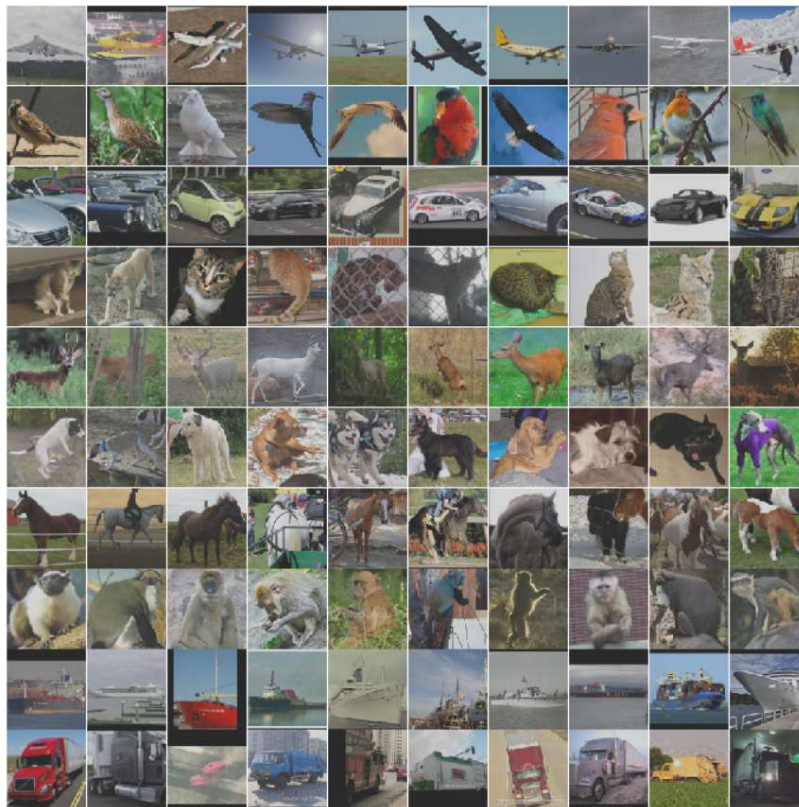
Not logged in. [Login](#) | [Signup](#)

ImageNet is an image database organized according to the **WordNet** hierarchy (currently only the nouns), in which each node of the hierarchy is depicted by hundreds and thousands of images. The project has been **instrumental** in advancing computer vision and deep learning research. The data is available for free to researchers for non-commercial use.

Mar 11 2021. ImageNet website update.

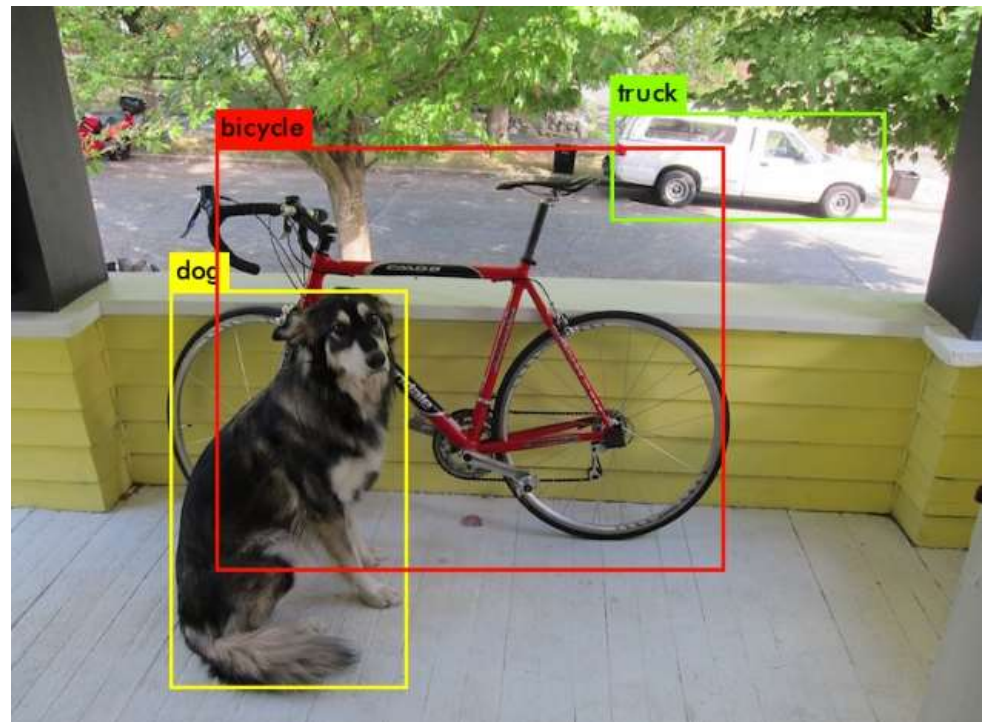
1. What is AI?

ImageNet data set (Sample images):



1. What is AI?

Object Detection with YOLOV3 (You **O**nly **L**ook **O**nce, **V**ersion 3):
It is a real-time object detection algorithm that identifies specific objects in videos, live feeds, or images.



1. What is AI?

GPT3:

Generative **P**re-trained **T**ransformer 3 (GPT3) is an autoregressive language model that uses deep learning to produce human-like text.

It is a kind of natural language processing (NLP) application. The architecture is a standard transformer network with the unprecedented size of 2048-token-long context and 175 billion parameters.

Q: Why?

A: Because dogs are loyal and friendly.

Q: What are two reasons that a dog might be in a bad mood?

A: Two reasons that a dog might be in a bad mood are if it is hungry or if it is hot.

Q: How many eyes does a giraffe have?

A: A giraffe has two eyes.

Q: How many legs does a frog have?

A: A frog has four legs.

Q: Are there any animals with three legs?

A: No, there are no animals with three legs.

Q: Why don't animals have three legs?

A: Animals don't have three legs because they would fall over.

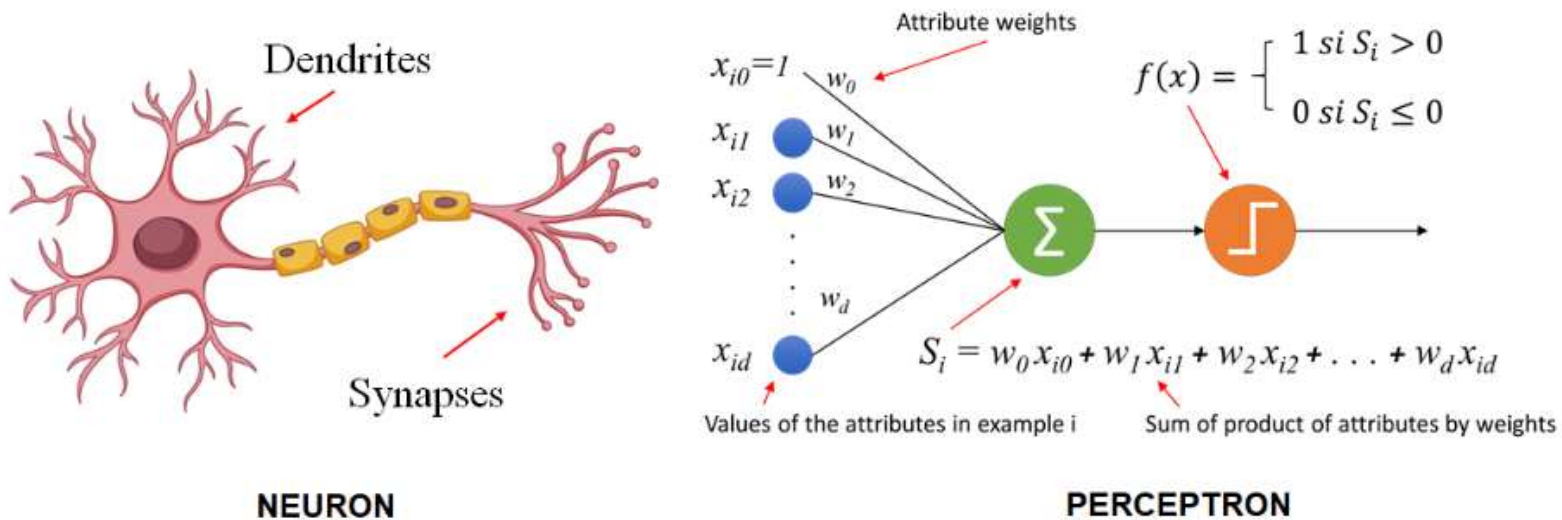


Conversation/Answering results with GPT3 algorithm.

1. What is AI?

Bioinspired Algorithms:

Artificial neural networks (ANN) (It uses the human brain nerve structures)

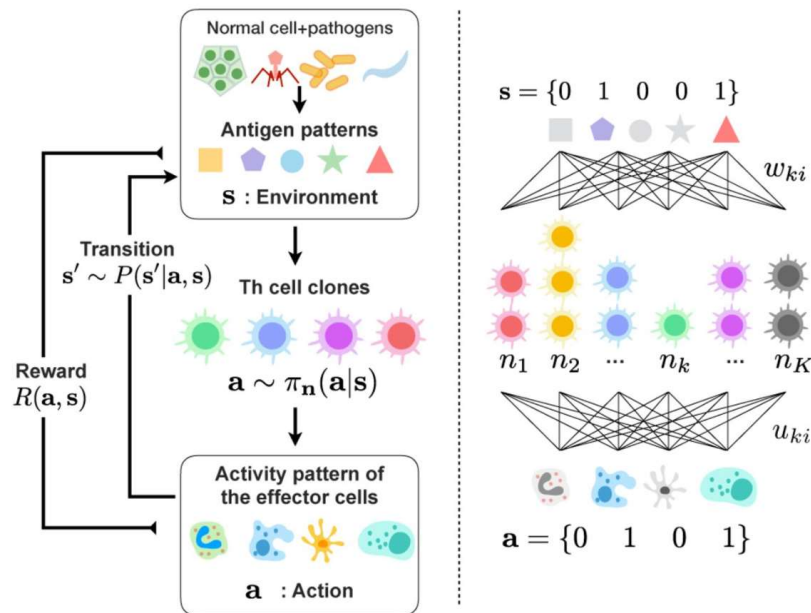


From: <https://inteligenciafutura.mx/english-version-blog/blog-06-english-version>

1. What is AI?

Bioinspired Algorithms:

Artificial immune system algorithm (Uses human immune system structure)



From: <https://www.biorxiv.org/content/10.1101/2020.01.31.929620v1.full>

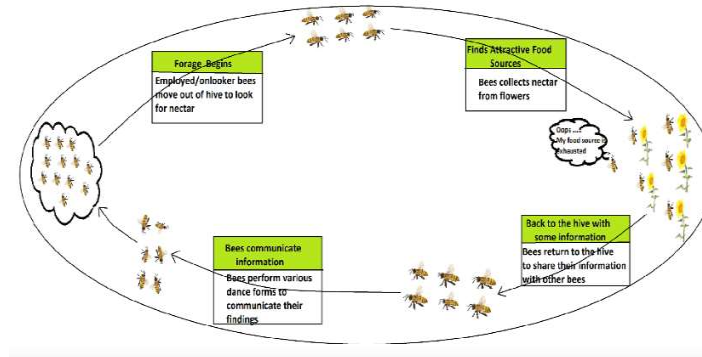
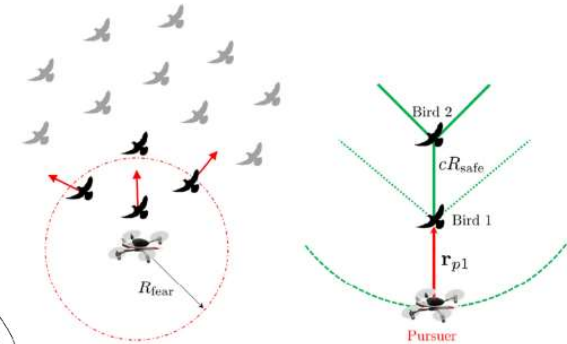
1. What is AI?

Nature inspired Algorithms:

Dolphin algorithm

Bird swarm algorithm

Artificial bee colony (ABC) algorithm



Sources: <https://transpireonline.blog/>

https://authors.library.caltech.edu/87601/2/tro-chung-2853610_final1.pdf

<https://www.semanticscholar.org/paper/Artificial-bee-colony-algorithm%3A-a-survey-Bansal-Sharma/1871d4935d203448cda30b36802e468e8823bbeb>

<https://analyticsindiamag.com/a-tutorial-on-particle-swarm-optimization-in-python/>

1. What is AI?

Nature inspired Algorithms:

Ant colony optimization algorithm
Particle swarm intelligence (PSI) algorithms

...

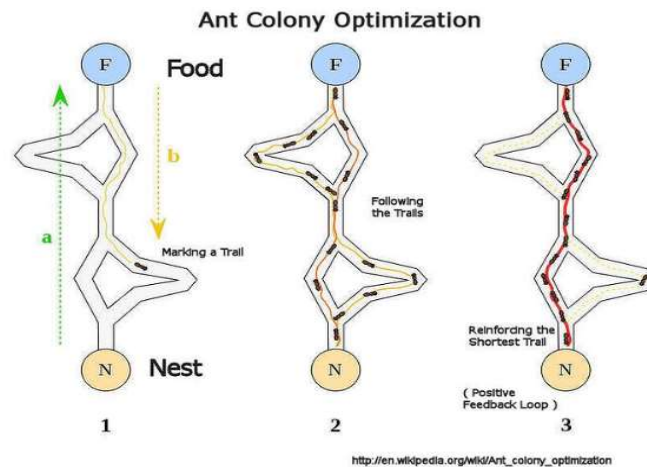


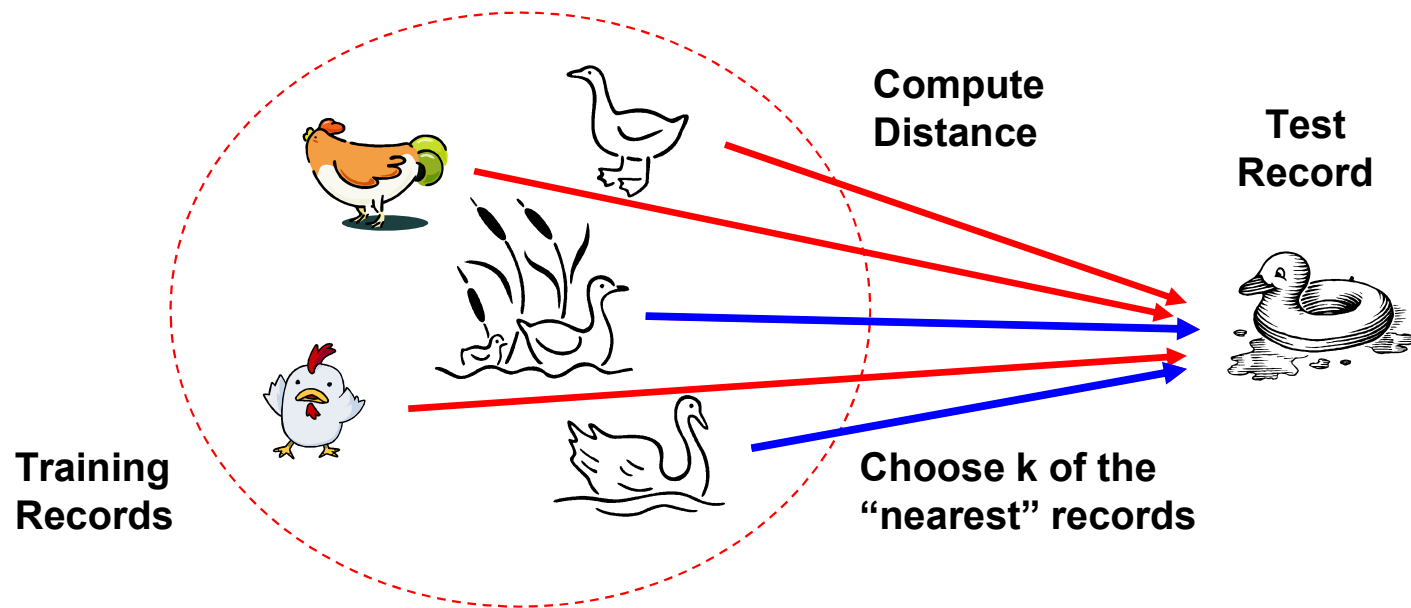
Photo by [Sebastian Pena Lambarrj](#) on [Unsplash](#)

Sources: <https://transpireonline.blog/>
https://authors.library.caltech.edu/87601/2/tro-chung-2853610_final1.pdf
<https://www.semanticscholar.org/paper/Artificial-bee-colony-algorithm%3A-a-survey-Bansal-Sharma/1871d4935d203448cda30b36802e468e8823bbeb>
<https://analyticsindiamag.com/a-tutorial-on-particle-swarm-optimization-in-python/>

1. What is AI?

k Nearest Neighbor (kNN) Classifier:

- Basic idea: If it walks like a duck, quacks like a duck, then it's probably a duck.



Data set links

UCI Machine learning repository:

<https://archive.ics.uci.edu/ml/index.php>

Data.gov

<https://data.gov/>

Google data set archive:

<https://datasetsearch.research.google.com/>

Kaggle:

<https://www.kaggle.com/datasets>

AWS:

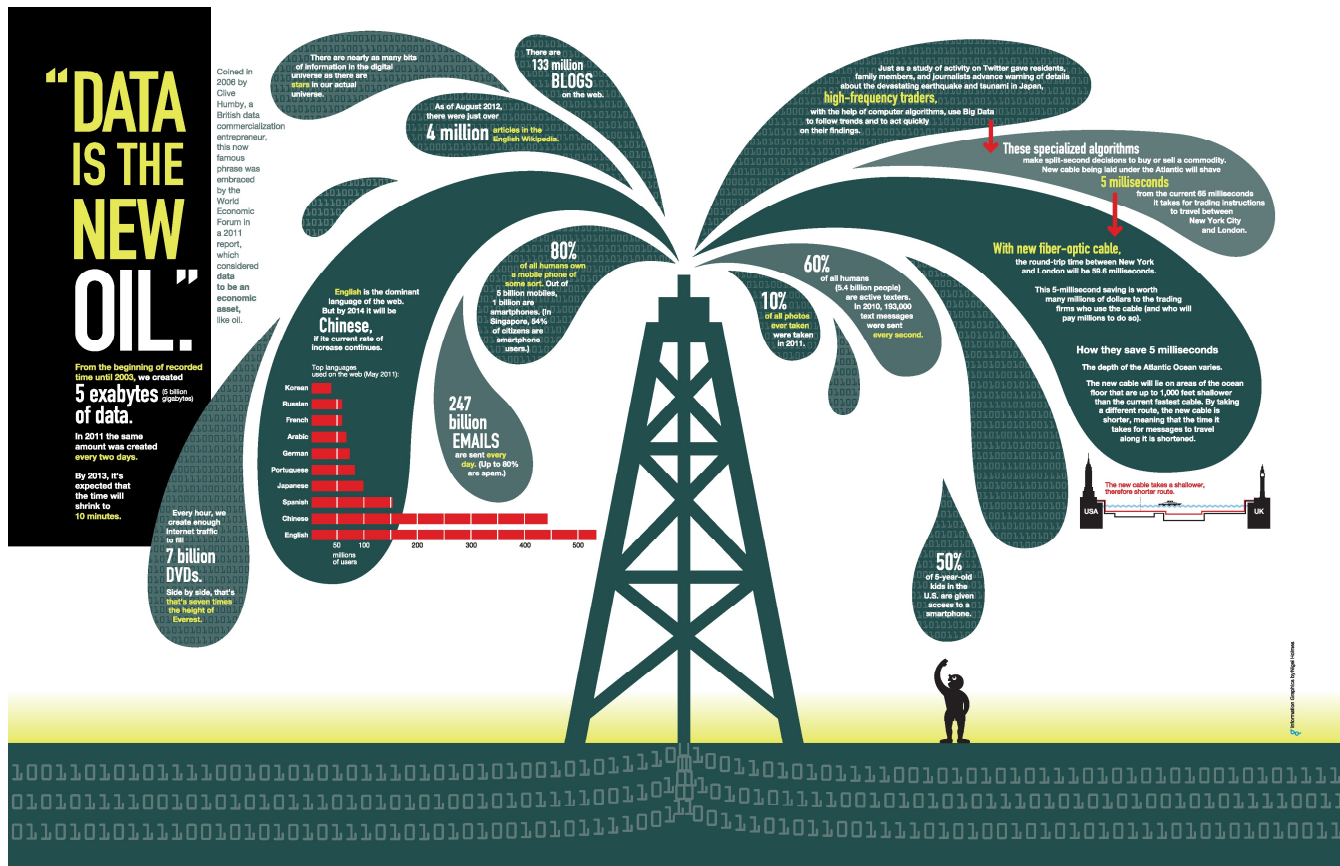
<https://registry.opendata.aws/>

The Data World:

<https://data.world/>

“Data is the New Oil” (World Economic Forum)

“AI is a new electricity” (Prof. Andrew Ng)



Some example data mining applications

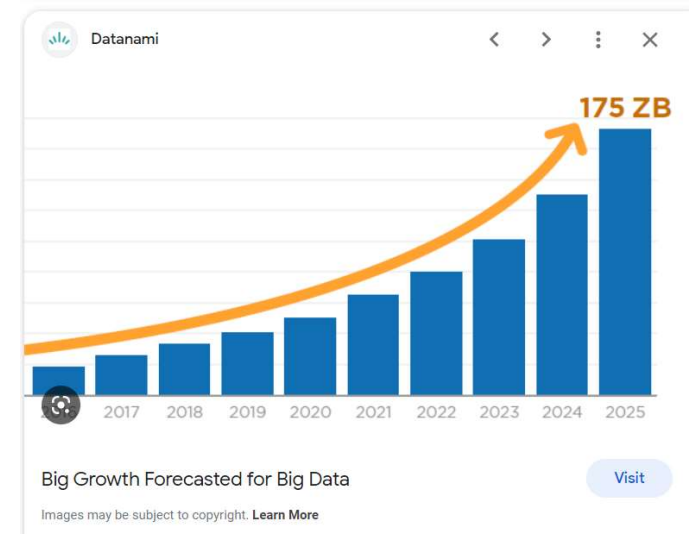
- **Marketing:** predict the characteristics of high life time value (LTV) customers, which can be used to support customer segmentation, identify upsell opportunities, and support other marketing initiatives.
- **Logistics:** forecast how many of which things you need and where will we need them, which enables learn inventory and prevents out of stock situations.
- **Healthcare:** analyze survival statistics for different patient attributes (age, blood type, gender, etc.) and treatments; predict risk of re-admittance based on patient attributes, medical history, etc.

more examples...

- **Transaction Databases** → Recommender systems (NetFlix), Fraud Detection (Security and Privacy)
- **Computer Vision** → Image and video applications/analysis.
- **Wireless Sensor Data** → Smart Home, Real-time Monitoring, Internet of Things
- **Text mining, Text Data, Social Media Data** → Product Review and Consumer Satisfaction (Facebook, Twitter, LinkedIn), E-discovery
- **Software Log Data** → Automatic Trouble Shooting
- **Genotype and Phenotype Data** → Epic, 23andme, Patient-Centered Care, Personalized Medicine

Why do we need AI?

- Really, really huge amounts of raw data!!
 - In the digital age, TB of data is generated by the second
 - Mobile devices, digital photographs, web documents.
 - Facebook updates, Tweets, Blogs, User-generated content
 - Transactions, sensor data, surveillance data
 - Queries, clicks, browsing
- We need to analyze the raw data to **extract knowledge**.



Why do we need AI?

- “The data is the computer”
 - Large amounts of **data** can be more **powerful** than complex **algorithms** and models.
 - Google has solved many Natural Language Processing problems, simply by looking at the data
 - Example: misspellings, synonyms
 - “Data is power!”
 - Today, the collected data is one of the biggest **assets** of an online company
 - Query logs of Google
 - The friendship and updates of Facebook
 - Tweets and follows of Twitter
 - Amazon transactions
- We need a way to harness the collective intelligence.

“Big Data” Sources (Where does the data come from?)

It's All Happening On-line

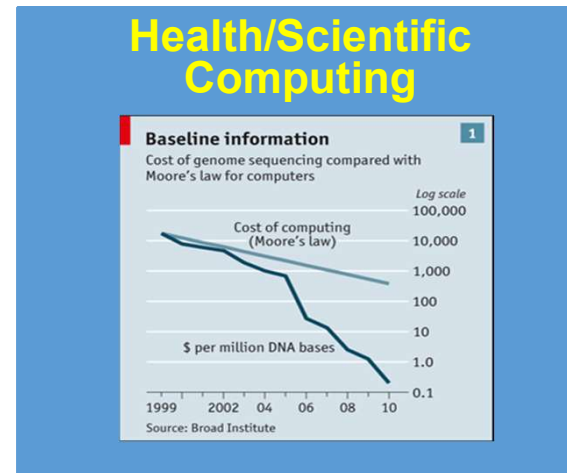



Every:
Click
Ad impression
Billing event
Fast Forward, pause, ...
Server request
Transaction
Network message
Fault
...

User Generated (Web & Mobile)



Internet of Things / M2M

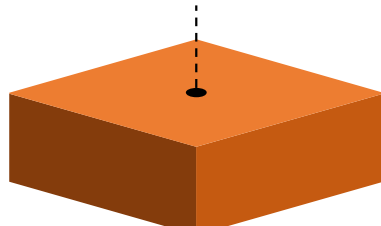


Data volumes

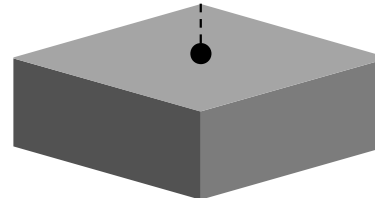
Only AI/Data Mining/Machine Learning has the power to analyze this data to solve grand challenges and problems guiding our future.



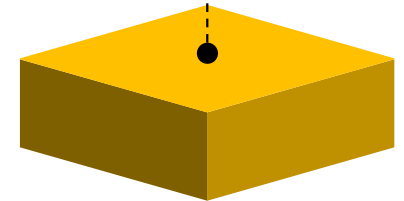
**44 ZB
2020,
50x 2010**



**2015/16
entire
human
history**



**26 billion
IoT
devices
2020**



Types of data: Image/video data

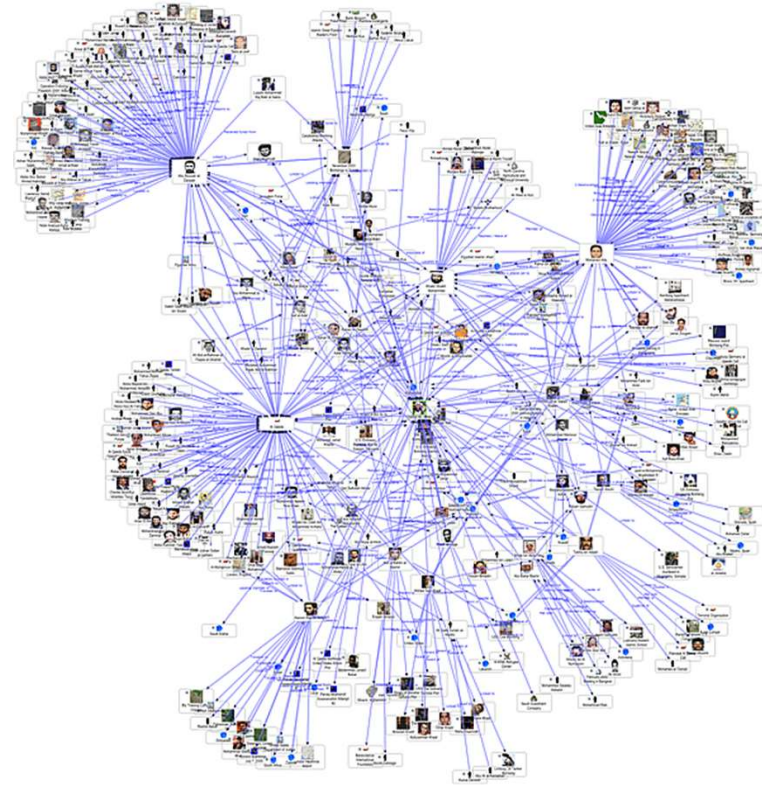
- We can think all image/video based data
- Photo/face images
- MR images
- Characters, digits
- Video surveillance cameras
- All computer vision-based data types ...

Types of Data: Graph Data

Lots of interesting data has a graph structure:

- Social networks
- Communication networks
- Computer Networks
- Road networks
- Citations
- Collaborations/Relationships
- ...

Some of these graphs can get quite large (e.g., Facebook user graph)



Types of Data: Transaction data

- Billions of real-life customers:
 - WALMART: 20M transactions per day
 - AT&T 300 M calls per day
 - Credit card companies: billions of transactions per day.

Types of Data: Document data

- Web as a document repository: Estimated 50 billions of web pages
- Wikipedia: 4 million articles (and counting).
- Online news portals: Steady stream of 100's of new articles every day.
- Twitter: ~300 million tweets every day.

Types of Data: Network data

- Web: 50 billion pages linked via hyperlinks
- Facebook: 500 million users
- Twitter: 300 million users
- Instant messenger: ~1billion users
- Blogs: 250 million blogs worldwide

Types of Data: Environmental data

- Climate data
- A database of temperature, precipitation and pressure records managed by the National Climatic Data Center and the Carbon Dioxide Information Analysis Center.
- 6000 temperature stations, 7500 precipitation stations, 2000 pressure stations.
 - Spatiotemporal data

Types of Data: Behavioral data

- Mobile phones today record a large amount of information about the user behavior
 - GPS records position
 - Camera produces images
 - Communication via phone and SMS
 - Text via Facebook updates
 - Association with entities via check-ins
- Amazon collects all the items that you browsed, placed into your basket, read reviews about, purchased.
- Google records all your browsing activity via toolbar plugins. They also record the queries you asked, the pages you saw and the clicks you did.
- Data collected for millions of users on a daily basis.

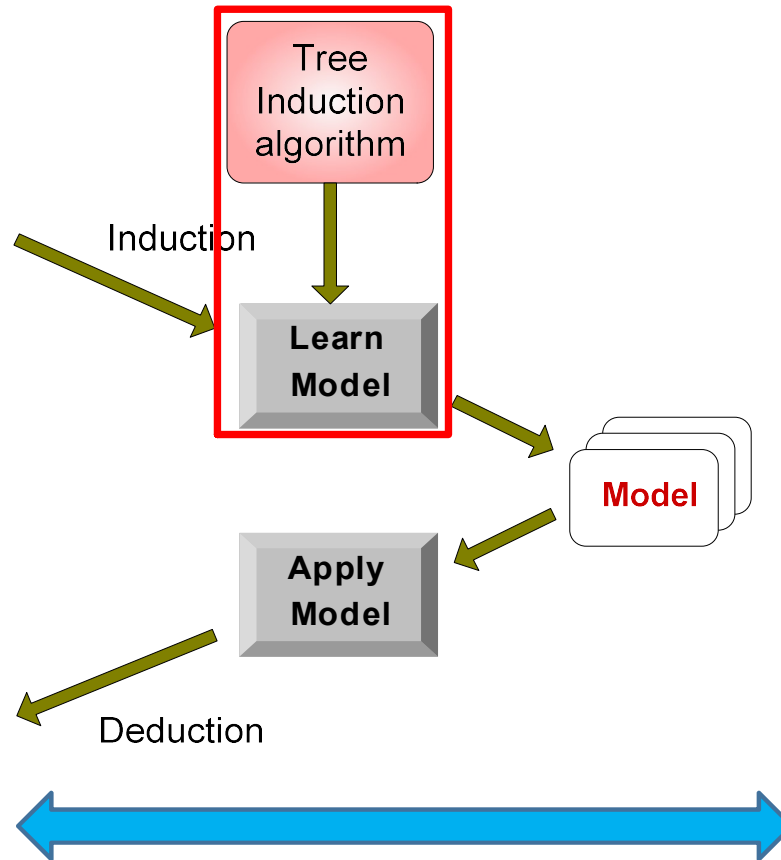
So, what is data?

Tid	Attrib1	Attrib2	Attrib3	Class
1	Yes	Large	125K	No
2	No	Medium	100K	No
3	No	Small	70K	No
4	Yes	Medium	120K	No
5	No	Large	95K	Yes
6	No	Medium	60K	No
7	Yes	Large	220K	No
8	No	Small	85K	Yes
9	No	Medium	75K	No
10	No	Small	90K	Yes

Training Set

Tid	Attrib1	Attrib2	Attrib3	Class
11	No	Small	55K	?
12	Yes	Medium	80K	?
13	Yes	Large	110K	?
14	No	Small	95K	?
15	No	Large	67K	?

Test Set



Fact:

Necessity of AI/machine learning algorithms:
Even for this very short data set, we can predict the test results.

Our brain **can not find** the result of test set for this very short table (data set).

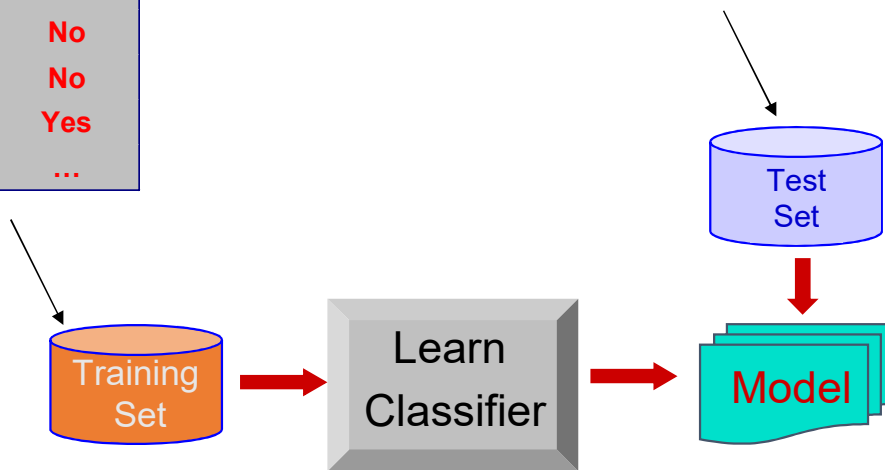
Question: How can we find the results of these kind of testing problems, if we have **millions of the lines and columns in a table/data set?**
→ The computer will do that with machine learning classification algorithms.

Classification Example

categorical *categorical* *quantitative* *class*

<i>Tid</i>	Employed	Level of Education	# years at present address	Credit Worthy
1	Yes	Graduate	5	Yes
2	Yes	High School	2	No
3	No	Undergrad	1	No
4	Yes	High School	10	Yes
...

<i>Tid</i>	Employed	Level of Education	# years at present address	Credit Worthy
1	Yes	Undergrad	7	?
2	No	Graduate	3	?
3	Yes	High School	2	?
...



Document Data

- Each document becomes a 'term' vector,
 - each term is a component (attribute) of the vector,
 - the value of each component is the number of times the corresponding term occurs in the document.
 - Bag-of-words representation – no ordering

	team	coach	play	ball	score	game	win	lost	timeout	season
Document 1	3	0	5	0	2	6	0	2	0	2
Document 2	0	7	0	2	1	0	0	3	0	0
Document 3	0	1	0	0	1	2	2	0	3	0

Ordered Data

- Genomic sequence data:

```
GGTTCCGCCTTCAGCCCCGCGCC  
CGCAGGGCCCGCCCCGCGCCGTC  
GAGAAGGGCCCGCCTGGCGGGCG  
GGGGGAGGCGGGGCCCGCCGAGC  
CCAACCGAGTCCGACCAGGTGCC  
CCCTCTGCTCGGCCTAGACCTGA  
GCTCATTAGGCGGCAGCGGACAG  
GCCAAGTAGAACACGCGAAGCGC  
TGGGCTGCCTGCTGCGACCAGGG
```

- Data is a long **ordered** string.

IEEE Spectrum / Top Programming Languages

(E)

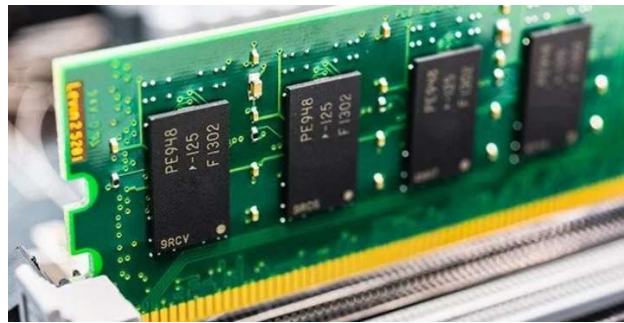
Rank	Language	Type	Score
1	Python	🌐 🖥️ ⚙️	100.0
2	Java	🌐 📱 🖥️	95.4
3	C	📱 🖥️ ⚙️	94.7
4	C++	📱 🖥️ ⚙️	92.4
5	JavaScript	🌐	88.1
6	C#	🌐 📱 🖥️ ⚙️	82.4
7	R	🖥️	81.7
8	Go	🌐 🖥️	77.7

Memory and Intelligence

What is the difference between **memory** and **intelligence**?

Memory table

Memory unit	Description
Kilo Byte	1 KB = 1024 Bytes
Mega Byte	1 MB = 1024 KB
Giga Byte	1 GB = 1024 MB
Tera Byte	1 TB = 1024 GB
Peta Byte	1 PB = 1024 TB
Hexa Byte	1 EB = 1024 PB
Zetta Byte	1 ZB = 1024 EB
Yotta Byte	1 YB = 1024 ZB
Bronto Byte	1 Bronto Byte = 1024 YB
Geop Byte	1 Geo Byte = 1024 Bronto Bytes



Computer memory can store a large amount of data, but it doesn't mean the computer is **intelligent**. We can say that it has very high storage **capacity**.

Human memory or a computer memory can store a large amount of data. Unless it doesn't find relationship(s) between data/items it can not be an intelligent. That's why in **IQ test**, they generally ask **finding relationships/patterns** questions. Because it measures intelligence.

Memory and Intelligence

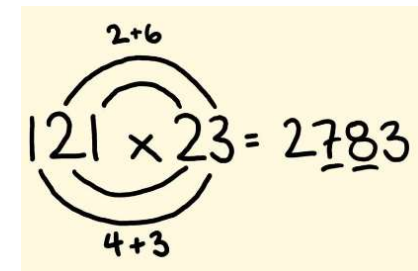
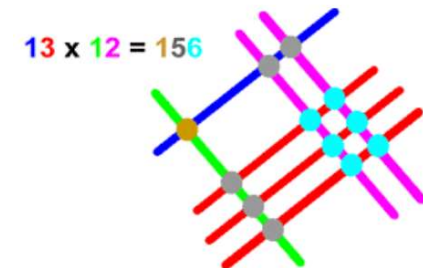
The difference between memory and intelligence:

Example: The calculator can multiply large numbers, but it doesn't mean the calculator is an intelligent machine or it has an intelligent algorithm. It only implements the multiplication rules in a few seconds.



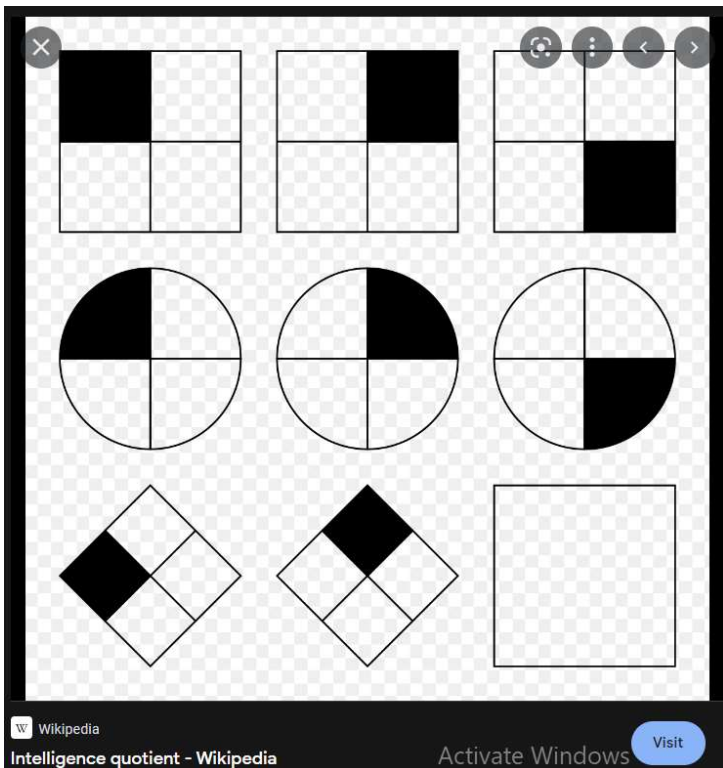
Finding the results of large operations like multiplication doesn't show the intelligence. It only represents the **capacity** or calculation speed per second.

Finding new way/new rule/relationship for the multiplication is an **intelligence**.



Memory and Intelligence

IQ questions generally ask to find the relationship between patterns, texts, images, etc.



7	6	3	45
8	8	1	65
9	8	3	75
4	6	9	?

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35
A

30
B

31
C

33
D

32
E

34
F

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Visit

Necessity of Data Mining/AI

The similar data set and test set example for the 'Playing Tennis' problem.

Dataset for Play Tennis

Outlook	Temperature	Humidity	Windy	PlayTennis
Sunny	Hot	High	False	No
Sunny	Hot	High	True	No
Overcast	Hot	High	False	Yes
Rainy	Mild	High	False	Yes
Rainy	Cool	Normal	False	Yes
Rainy	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Sunny	Mild	High	False	No
Sunny	Cool	Normal	False	Yes
Rainy	Mild	Normal	False	Yes
Sunny	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Rainy	Mild	High	True	No

Test: Overcast Mild Normal False Yes?/No?



What will be the prediction result label of this pattern/test? → Again we cannot find it, the computer will find the result label (Yes or No) with intelligent machine learning algorithms.

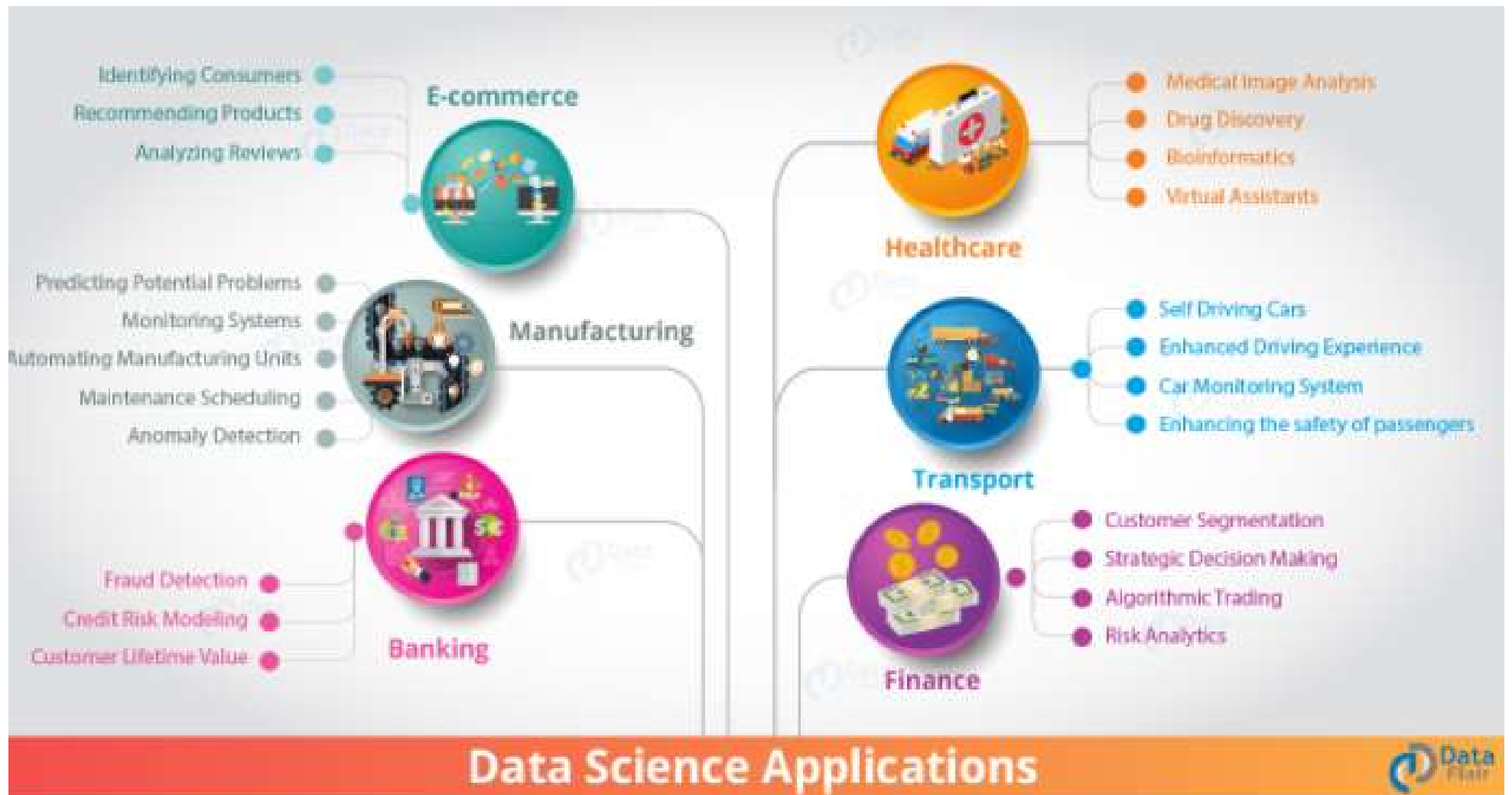
What is AI?

When we ask/write '**How are yo?**' to the standard software, it will not understand it. Because there is a missing letter in youu. It must be fully correct.

 Understanding this sentence is AI/machine learning in text mining domain.

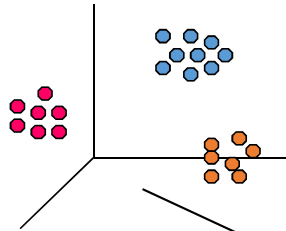
When we ask/write '**Hw are y**' to the AI-based/machine learning-based software, it will try to predict the correct sentence, it will generally (not always) will understand the missing parts and will try to reply this question like this:
'I am fine and how about you'.

So, the intelligent software will try to complete the words and understand the meaning of the sentence after training and testing it with a machine learning algorithm(s).

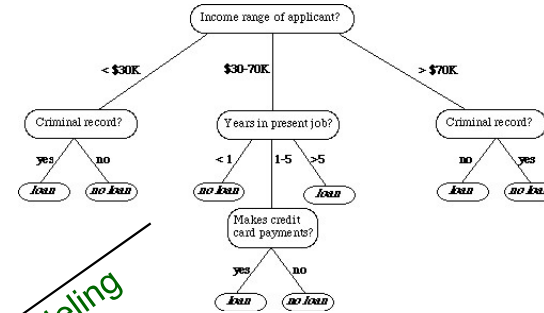


From <https://data-flair.training/blogs/data-science-applications/>

Data Science Tasks



Clustering

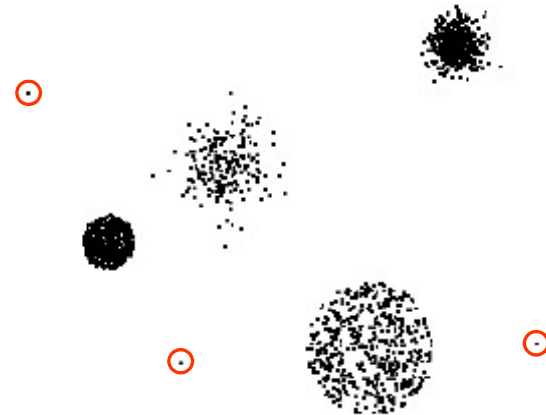


Predictive Modeling

Tid	Refund	Marital Status	Taxable Income	Cheat
1	Yes	Single	125K	No
2	No	Married	100K	No
3	No	Single	70K	No
4	Yes	Married	120K	No
5	No	Divorced	95K	Yes
6	No	Married	60K	No
7	Yes	Divorced	220K	No
8	No	Single	85K	Yes
9	No	Married	75K	No
10	No	Single	90K	Yes
11	No	Married	60K	No
12	Yes	Divorced	220K	No
13	No	Single	85K	Yes
14	No	Married	75K	No
15	No	Single	90K	Yes

Association Rules

Anomaly Detection



Classification Algorithms

Example: There are 400 face images in the Olivetti Face Dataset (40 individuals and 10 different poses for each individual)

Sample images from
the Olivetti Face Dataset



10 different face poses for the first person

Clustering Algorithms

Dataset Output:



Clustering Algorithms

(Cont.): Output:

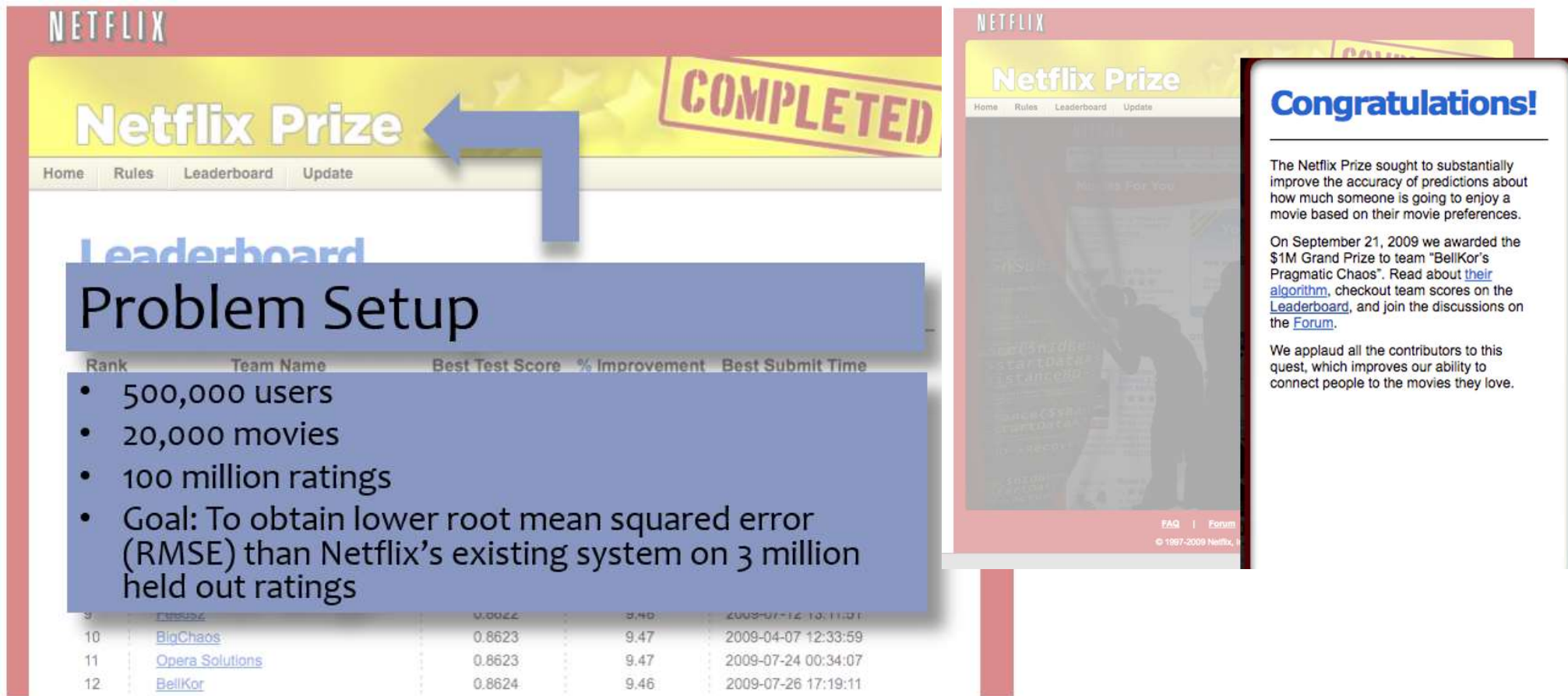
	pc1	pc2	food
1	-1576.720777	6640.098152	burger
2	-493.800876	6398.361105	burger
3	990.094212	7235.939757	burger
4	2189.873139	9050.873278	burger
5	-7843.064559	-1061.402604	drink
6	-8498.425200	-5438.330127	drink
7	-11181.850637	-5320.763061	drink
8	-6851.906537	1125.202775	drink
9	7635.123110	-5043.981363	pasta
10	-708.058086	-528.693481	pasta
11	7236.249526	-5301.451041	pasta
12	4417.340369	-4659.245272	pasta
13	11864.491941	1472.311895	chicken
14	76.452588	1365.765847	chicken
15	-7505.614631	-1163.274804	chicken
16	10249.816419	-4771.411055	chicken

Netflix a problem

The screenshot shows a web browser window with the address bar displaying 'Buomsoo Kim'. The main content is a red banner for 'NETFLIX' with a yellow section containing 'Netfli Prize' and a large red stamp that says 'COMPLETED'. Below this is a navigation bar with 'Home', 'Rules', 'Leaderboard', and 'Update'. The main body of the page is dark with a 'Congratulations!' heading in blue. The text below reads: 'The Netflix Prize sought to substantially improve the accuracy of predictions about how much someone is going to enjoy a movie based on their movie preferences. On September 21, 2009 we awarded the \$1M Grand Prize to team "BellKor's Pragmatic Chaos". Read about [their algorithm](#), checkout team scores on the [Leaderboard](#), and join the discussions on the [Forum](#). We applaud all the contributors to this quest, which improves our ability to connect people to the movies they love.' A 'Visit' button is visible in the bottom right. At the bottom of the browser window, there is a watermark for 'Activate Windows' and a message: 'Go to Settings to activate Windows.'

2009. This
ion (NMF).

Nonnegative Matrix Factorization (NMF)



The image shows a screenshot of the Netflix Prize website. At the top, there is a yellow banner with the text "Netflix Prize" and a large blue arrow pointing left. To the right of the banner is a red stamp that says "COMPLETED". Below the banner is a navigation menu with links for "Home", "Rules", "Leaderboard", and "Update". The main content area is titled "Leaderboard" and "Problem Setup". A blue box contains the following text:

- 500,000 users
- 20,000 movies
- 100 million ratings
- Goal: To obtain lower root mean squared error (RMSE) than Netflix's existing system on 3 million held out ratings

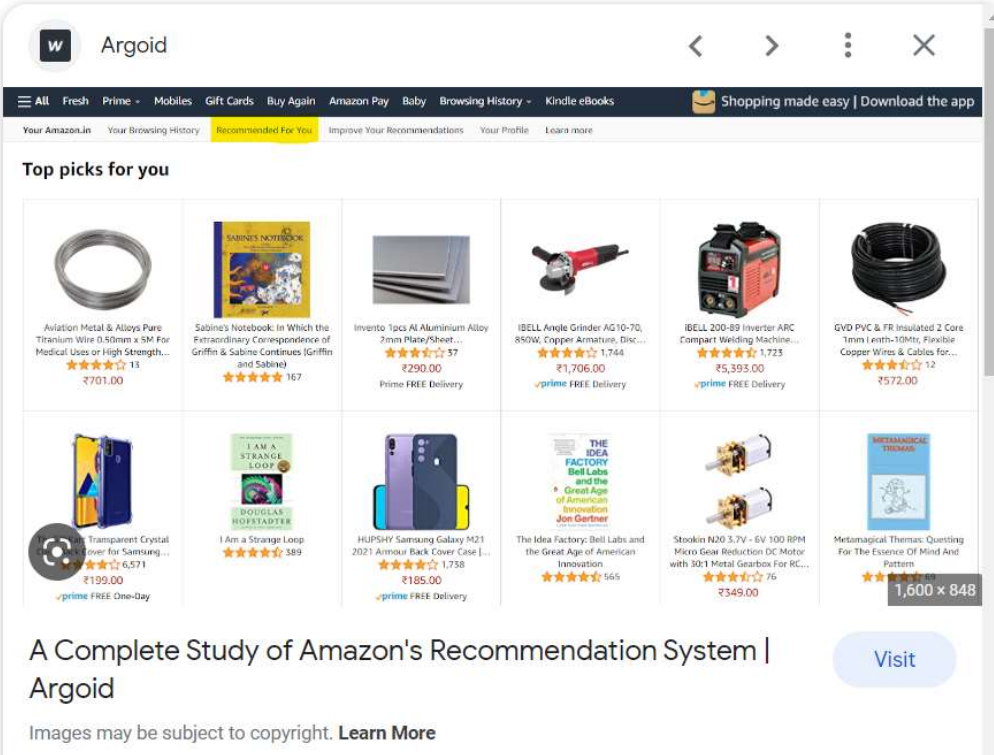
Below the text is a table with the following columns: Rank, Team Name, Best Test Score, % Improvement, and Best Submit Time. The table shows the following data:

Rank	Team Name	Best Test Score	% Improvement	Best Submit Time
9	FMSBYZ	0.8622	9.46	2008-07-12 10:11:01
10	BigChaos	0.8623	9.47	2009-04-07 12:33:59
11	Opera Solutions	0.8623	9.47	2009-07-24 00:34:07
12	BellKor	0.8624	9.46	2009-07-26 17:19:11

On the right side of the screenshot, there is a "Congratulations!" message. The text reads: "The Netflix Prize sought to substantially improve the accuracy of predictions about how much someone is going to enjoy a movie based on their movie preferences. On September 21, 2009 we awarded the \$1M Grand Prize to team 'BellKor's Pragmatic Chaos'. Read about [their algorithm](#), checkout team scores on the [Leaderboard](#), and join the discussions on the [Forum](#). We applaud all the contributors to this quest, which improves our ability to connect people to the movies they love."

Recommender systems

Amazon and other e-trade companies use a **recommender systems**. There is a recommender/machine learning engine behind their link.

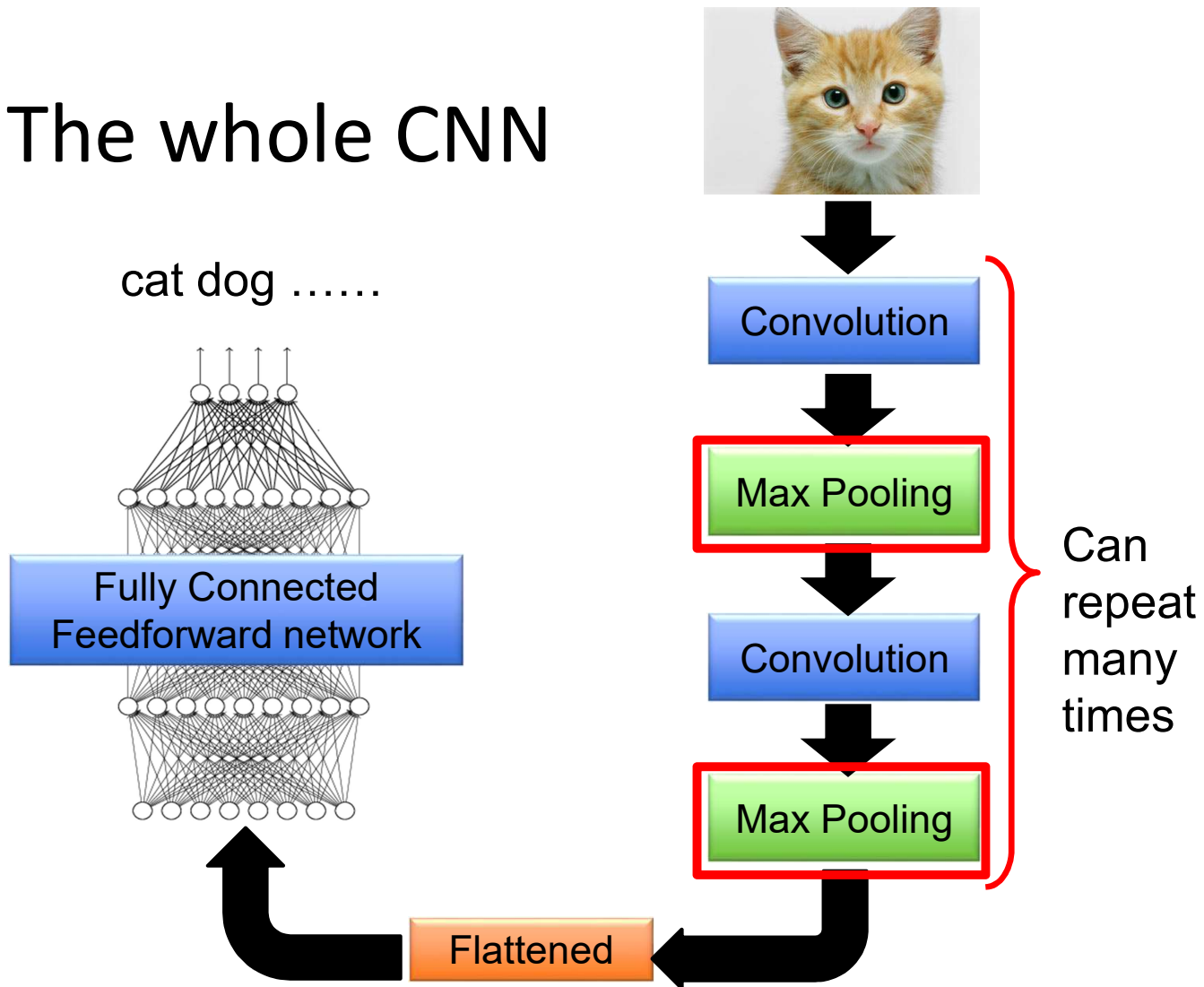


The screenshot shows the Amazon India website's 'Recommended for you' section. The page features a grid of 12 product recommendations, each with an image, title, price, and star rating. The products include:

- Aviation Metal & Alloys Pure Titanium Wire 0.50mm x 3M For Medical Uses or High Strength... (₹701.00)
- Sabine's Notebook In Which the Extraordinary Correspondence of Griffin & Sabine Continues (Griffin and Sabine) (₹290.00)
- Invento Tpcs Al Aluminium Alloy 2mm (New/Sheet... (₹290.00)
- IBELL Angle Grinder AG 10-70, 850W, Copper Armature, Disc... (₹1,706.00)
- IBELL 200-89 Inverter ARC Compact Welding Machine... (₹5,393.00)
- GVD PVC & FR Insulated 2 Core Twin Lead-10Mts. Flexible Copper Wires & Cables for... (₹572.00)
- Transparent Crystal Cover for Samsung... (₹199.00)
- I Am a Strange Loop (₹389)
- HUPSHY Samsung Galaxy M21 2021 Armour Back Cover Case L... (₹185.00)
- The Idea Factory: Bell Labs and the Great Age of American Innovation (Jon Gertner) (₹565)
- Stookin N20 3.7V - 6V 100 RPM Micro Gear Reduction DC Motor with 30:1 Metal Gearbox For RC... (₹349.00)
- Metaphysical Themes: Questioning For The Essence Of Mind And Pattern (₹1,600 x 848)

At the bottom of the page, there is a link to 'A Complete Study of Amazon's Recommendation System | Argoid' with a 'Visit' button. Below this link, it states 'Images may be subject to copyright. Learn More'.

The whole CNN



I. Classification Algorithms

- Feature extraction architecture:
 - After 2 convolutional layers, a max-pooling layer reduces the size of the feature maps (typically by 2)
 - A fully convolutional and a softmax layers are added last to perform classification



Slide credit: Param Vir Singh – Deep Learning

I. Classification Algorithms

MNIST digit data set.



Sample images (digits) from the MNIST data set.

The MNIST database contains **60,000** training images and **10,000** testing images.

I. Classification Algorithms

AI in fashion:



1. What is AI?

AI films/Series:

The Matrix (2000)

Person of Interest (2011-2016)



Person of Interest (TV Series 2011-2016) - IMDb



The Matrix (1999) - IMDb

Python compilers/Machine learning libraries

NumPy, Pandas, and Scikit-learn machine learning libraries:

```
Import numpy as np
```

```
Import pandas as pd
```

```
From Pandas import Series
```

```
From pandas.plotting import parallel_coordinates
```

```
From sklearn.decomposition import PCA
```

```
From sklearn import linear_model
```

```
Sklearn.datasets.load_iris()
```



NumPy



Simple. Flexible. Powerful.

*From en.wikipedia.com,
keras.io and tensorflow.org*

2. What is ChatGPT?

What is ChatGPT?

It's a chatbot and uses large language model (LLM).

There are many chatbots, but the most powerful one is ChatGPT. It's old, not new.

Bank chatbot, electric company chatbot, ... (train/test)

There are thousands of chatbots in the world...

There is tough competition between Google and Microsoft over the LLM.

2. What is ChatGPT?

← → ↻ 🏠 arstechnica.com/information-technology/2023/05/ibm-pauses-hiring-around-7800-roles-that-could

ADVENTURES IN AUTOMATION —

IBM plans to replace 7,800 jobs with AI over time, pauses hiring certain positions

IBM CEO Arvind Krishna says he could see 30% of back-office functions replaced by AI over 5 years.

BENJ EDWARDS - 5/2/2023, 10:48 AM



2. What is ChatGPT?

forbes.com/sites/qai/2023/01/27/microsoft-confirms-its-10-billion-investment-into-chatgpt

Subscribe to newsletters


Forbes

Microsoft Confirms Its \$10 Billion Investment Into ChatGPT, Changing How Microsoft Competes With Google, Apple And Other Tech Giants

Q.ai - Powering a Personal Wealth Movement
Contributor @
Making wealth creation easy, accessible and transparent.

2 Jan 27, 2023, 12:56pm EST

Listen to article 10 minutes



cnbc.com/2022/12/15/google-vs-chatgpt-what-happened-when-i-swapped-services-for-a-day.html

MARKETS BUSINESS INVESTING TECH POLITICS CNBC TV INVESTING CLUB PRO

TECH

Google vs. ChatGPT: Here's what happened when I swapped services for a day

PUBLISHED THU, DEC 15 2022 2:39 PM EST

Sofia Pitt @SOFIA_PITT


SHARE f t in e

KEY POINTS

- ChatGPT has gone viral since OpenAI released the text-based artificial intelligence chatbot tool in November.
- Google has been bragging about its AI expertise for years, and some employees are wondering if they missed an opportunity, CNBC reported. Analysts are also wondering if AI chatbots could someday threaten Google's dominance.
- So I decided to give it a try.

Squawk on the Street WATCH LIVE
UP NEXT | Squawk on the Street 11:00 am ET Listen

Introducing the Xfinity 10G Network Learn more



3. AI and the Future of Jobs?

What is the effect of the internet on our life/jobs? → It will eliminate some jobs.

AI in our life:

Artificial doctor

AI judge

AI and journalism

White collar-based jobs may decrease

....

3. AI and the Future of Jobs?

What is the effect of the internet on our life/jobs?

Automatic code generation/debugging

The screenshot shows a web browser window with the URL `towardsdatascience.com/from-data-engineering-to-prompt-engineering-5debd1c636e0`. The article title is **From Data Engineering to Prompt Engineering**, with a subtitle **Solving data preparation tasks with ChatGPT**. The author is **Christian Koch**, with a 'Follow' button and a 'tds' badge. The article is published in **Towards Data Science**, with a reading time of **8 min read** and published **1 day ago**. At the bottom, there are icons for clapping (205), commenting (2), bookmarking, playing, sharing, and a menu.

3. AI and the Future of Jobs?

What happened: OpenAI's battle with European regulators [remains ongoing](#) after the company successfully resolved Italy's [ban on ChatGPT](#).

What it means: While ChatGPT is blocked or banned in [China, Russia](#), and other countries, Italy was the first in Europe to take that step, citing concerns about its data collection, minor access, and inaccurate and misleading information. While it has since lifted that ban, Italy is [now reviewing other generative AI platforms](#), while [Germany, France](#), and [Spain](#) have launched their own investigations into ChatGPT.

The bigger picture: Regulators are scrutinizing the ways AI systems gather data and generate information, which could run afoul of Europe's General Data Protection Regulation (GDPR). The privacy framework requires consent for personal data storage and collection. If regulators demand modifications from OpenAI, it could impact ChatGPT's functioning and [have implications for generative AI systems worldwide](#).

Countries that have banned ChatGPT

Russia, China, North Korea, Cuba, Iran, and Syria have all banned the AI chatbot over privacy and misinformation concerns



3. AI and the Future of Jobs?

Which jobs will be affected by AI?

Customer Service Representatives

Receptionists

Accountants/ Bookkeepers

Salespeople

Taxi and Truck Drivers

Retail Services

Proofreaders and Translators

Cashier

Coding

Media jobs (advertising, content creation, technical writing, journalism)

Legal industry jobs (paralegals, legal assistants)

3. AI and the Future of Jobs?

Which jobs will be affected by AI?

Finance and banking (Financial analysts, personal financial advisors)

Trader/broker/Stockmarket-based positions

Media and marketing

Graphic Designers

Accountants

Drivers

Human Resources (HR)

White collar-based jobs (CEOs, managers, etc.)

3. AI and the Future of Jobs?

Which jobs will be affected by AI?



4. AI and Redesigning Education

- AI-generated text/article/paper/essay
- Summarize texts/chapters/write literature survey/write one paragraph abstract/
- Authenticate software to find the similarity score of texts, articles, books, and thesis, ...
- Rubric design

4. AI and Redesigning Education

ChatGPT: Prepare a quiz exam on Python programming language

ChatGPT: Draw an infographic about climate change in the last 50 years.

Preparation of ppt, animation, etc.

AI text-generation

AI text generated text detection

5. AI Regulations and Their Social Impacts



The screenshot shows a web browser window displaying a White House press release. The browser's address bar shows the URL: whitehouse.gov/briefing-room/statements-releases/2023/05/04/fact-sheet-biden-harris-administration-announces-new-act.... The page header includes "THE WHITE HOUSE" on the left, the White House logo in the center, and a "MENU" button on the right. Below the header, the date "MAY 04, 2023" is centered. The main title of the press release is "FACT SHEET: Biden-Harris Administration Announces New Actions to Promote Responsible AI Innovation that Protects Americans' Rights and Safety". Below the title is a breadcrumb trail: "BRIEFING ROOM > STATEMENTS AND RELEASES". The first paragraph of the text reads: "Today, the Biden-Harris Administration is announcing new actions that will further promote responsible American innovation in artificial intelligence (AI) and protect".

5. AI Regulations and Their Social Impacts

← → ↻ 🏠 theguardian.com/technology/2022/dec/04/ai-bot-chatgpt-stuns-academics-with-essay-writing-skills-and-usability#:~:text=AI%20bot%20Cha

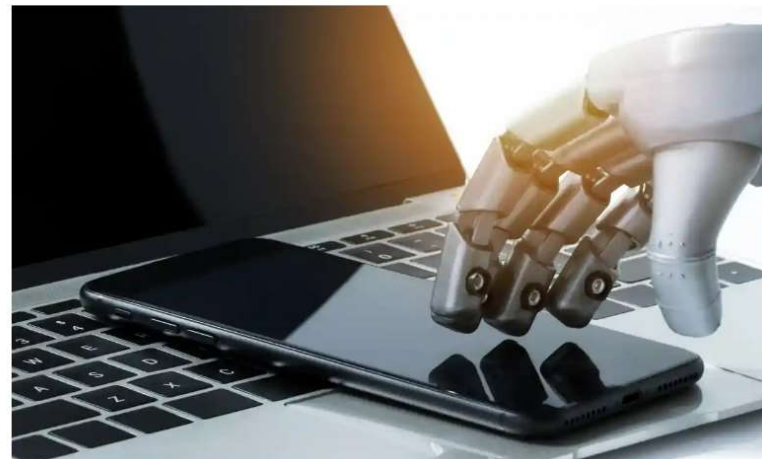
AI bot ChatGPT stuns academics with essay-writing skills and usability

Latest chatbot from Elon Musk-founded OpenAI can identify incorrect premises and refuse to answer inappropriate requests

Alex Hern

🐦 @alexhern

Sun 4 Dec 2022 14:17 EST



📷 The chatbot generated a response to an exam question that an academic said would have resulted in full marks if submitted by an undergraduate. Photograph: Jiraroj Praditcharoenkul/Alamy

Professors, programmers and journalists could all be out of a job in just a few years, after the latest chatbot from the Elon Musk-founded OpenAI foundation stunned onlookers with its writing ability, proficiency at complex tasks, and ease of use.

5. AI Regulations and Their Social Impacts

The image shows a screenshot of a web browser displaying the Chatham House website. The browser's address bar shows the URL: chathamhouse.org/2023/01/ai-governance-and-human-rights. The website header features the Chatham House logo on the left, and navigation links for "Sign in or create account", "Search", and "Support us" on the right. Below the header is a horizontal menu with dropdown arrows for "Topics", "Regions", "Events", "Publications", "Become a member", "Leadership Academy", and "About us". The main content area has a dark background with a futuristic, glowing blue and white circular pattern. A person wearing a VR headset and a backpack is visible on the right side of the image. The main title "AI governance and human rights" is prominently displayed in white text. Below the title, the subtitle "Resetting the relationship" is shown. At the bottom of the page, there is a row of metadata: "RESEARCH PAPER", "10 JANUARY 2023", "ISBN: 978 1 78413 549 2", and "DOI: 10.55317/9781784135492". A white downward-pointing arrow is located in the bottom right corner of the page.

← → ↻ 🏠 chathamhouse.org/2023/01/ai-governance-and-human-rights 📄 ☆ ⚙️ 📱 B

CHATHAM HOUSE

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Topics ▾ Regions ▾ Events Publications ▾ Become a member ▾ Leadership Academy About us ▾

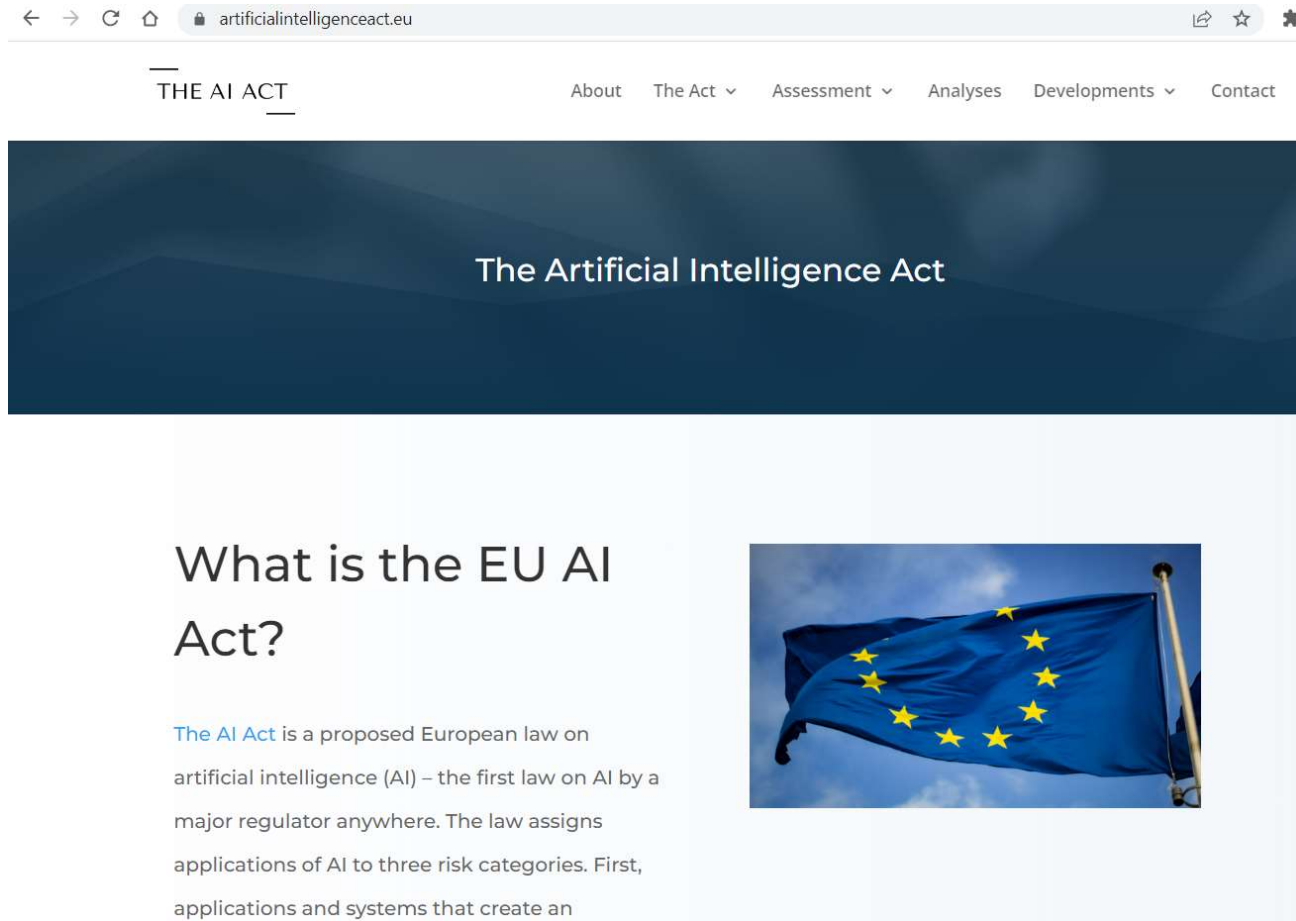
AI governance and human rights

Resetting the relationship

RESEARCH PAPER 10 JANUARY 2023 ISBN: 978 1 78413 549 2 DOI: 10.55317/9781784135492

↓

5. AI Regulations and Their Social Impacts




← → ↻ 🏠 artificialintelligenceact.eu 🔒 ☆ ⚙️

THE AI ACT About The Act Assessment Analyses Developments Contact

The Artificial Intelligence Act

What is the EU AI Act?

The AI Act is a proposed European law on artificial intelligence (AI) – the first law on AI by a major regulator anywhere. The law assigns applications of AI to three risk categories. First, applications and systems that create an



5. AI Regulations and Their Social Impacts

New York City public schools ban access to AI tool that could help students cheat

By Jennifer Korn and Samantha Kelly, CNN
Updated 9:13 AM EST, Fri January 6, 2023



MORE FROM CNN BUSINESS



Russia predicts trade with China will hit record \$200 billion in 2023


5. AI Regulations and Their Social Impacts

← → ↻ 🏠 🔒 reuters.com/technology/davos-2023-ceos-buzz-about-chatgpt-style-ai-world-economic-forum-2023-01-17/ Exclud

REUTERS® World ▾ Business ▾ Markets ▾ Sustainability ▾ Legal ▾ Breakingviews Technology ▾ Invest

By Jeffrey Dastin ▾
January 20, 2023 6:03 AM CST · Updated 4 months ago

🔗 📌 Aa



People walk past the logo of the World Economic Forum (WEF) 2023 at Davos Congress Centre in the Alpine resort of Davos, Switzerland, January 15, 2023. REUTERS/Arnd Wiegmann

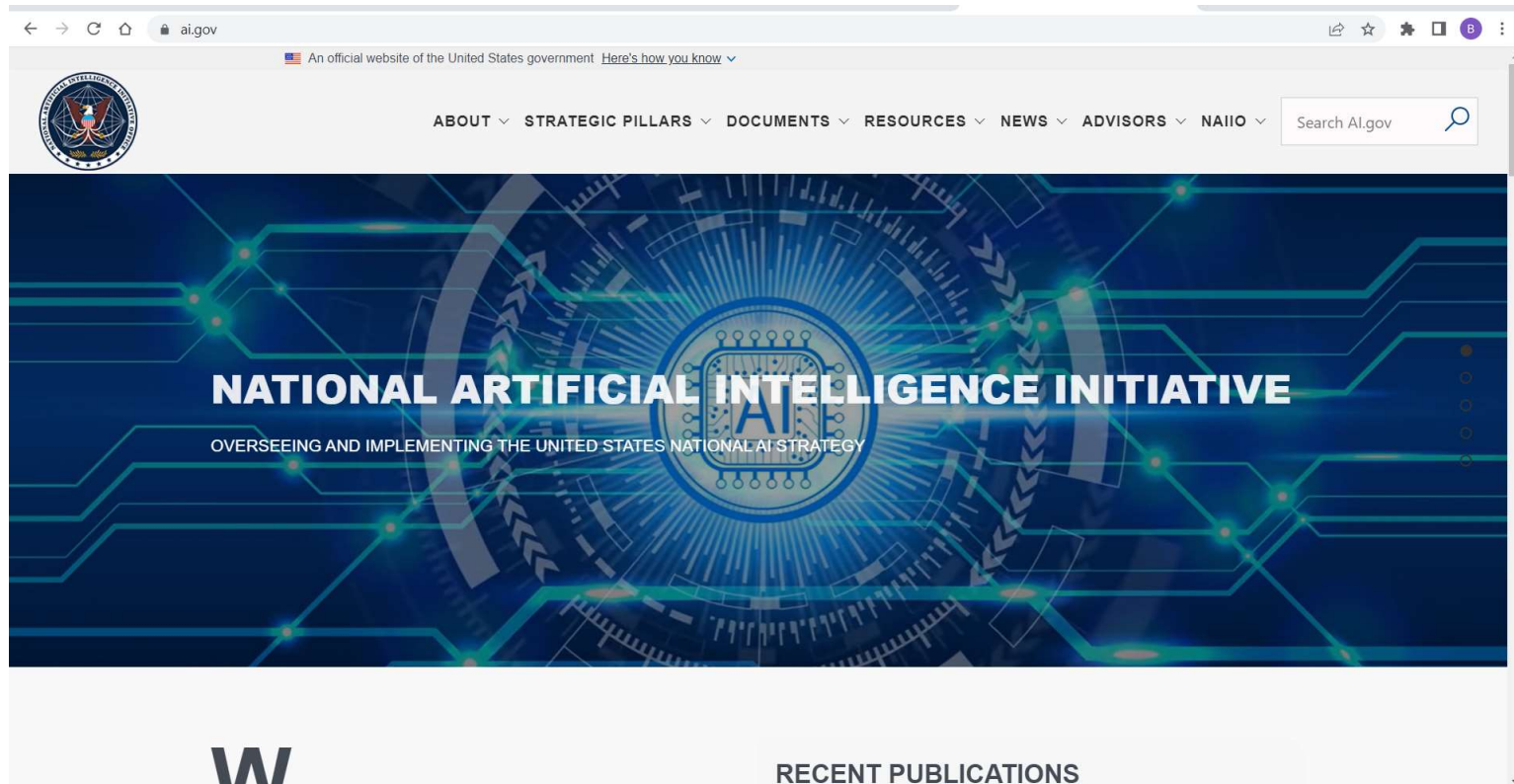
DAVOS, Switzerland, Jan 17 (Reuters) - Business titans trudging through Alpine snow can't stop talking about a chatbot from San Francisco.

5. AI Regulations and Their Social Impacts

- Society 4.0
- Dialogue between humans

6. Resources

ai.gov



ChatGPT

We may ask the following questions to the ChatGPT platform:

You can sign up to the ChatGPT: <https://openai.com/>

Then you can ask the following sample questions to ChatGPT:

- What is artificial intelligence?
- Write a Python code to find the minimum element of a list
- Write a poet about nature
- Write a paragraph about NBA and Chicago Bulls
- Find me an animation about trust for a kid
- Can you solve high order of polynomial equations?

6. Resources

AI, machine learning, data science Research labs:
Universities, governments, commercial companies, startups, etc.

Job opportunities (Indeed.com, LinkedIn, etc.)

Books

Google AI, Microsoft AI, Amazon AI, Apple AI, NASA AI, Intel AI, ...

References:

- Artificial Intelligence: A Modern Approach, Pearson Pub.
- Introduction to Data Mining, Tan, Steinbach, Karpatne, Kumar.
- Fayyad, et.al., Advances in Knowledge Discovery and Data Mining.
- Several internet resources.