



Birla Institute of Technology and Science Pilani, Hyderabad Campus

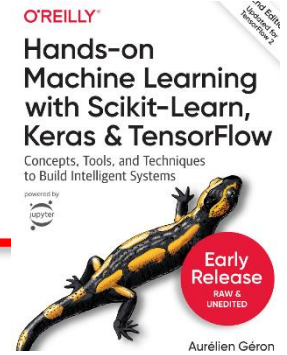
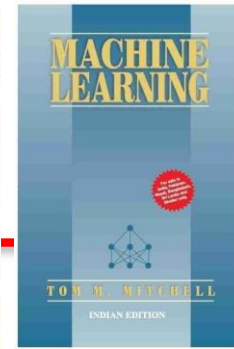
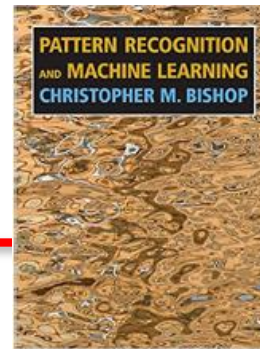
02.08.2024

BITS F464: Machine Learning (1st Sem 2024-25) **COURSE ADMINISTRATION & MOTIVATION**

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Acknowledgements: Christopher Bishop, Tom Mitchell, Kevin Murphy, Jeremy Watt, Ethem Alpaydin

Text and Ref Books



Text Books:

T1: Christopher Bishop: Pattern Recognition and Machine Learning, Springer-Verlag New York Inc., 2006.

T2: Tom M. Mitchell: Machine Learning, MGH The McGraw-Hill, Indian Edition, 2017.

Reference Books:

R1: Kevin Murphy: Machine Learning: A Probabilistic Perspective, MIT Press, 2012.

R2: Shai Shalev-Shwartz and Shai Ben-David: Understanding Machine Learning: From Theory to Algorithms, Cambridge University Press, 2014.

R3: Ethem Alpaydin: Introduction to Machine Learning, 3rd Edition, MIT Press, 2014.

Evaluation Scheme

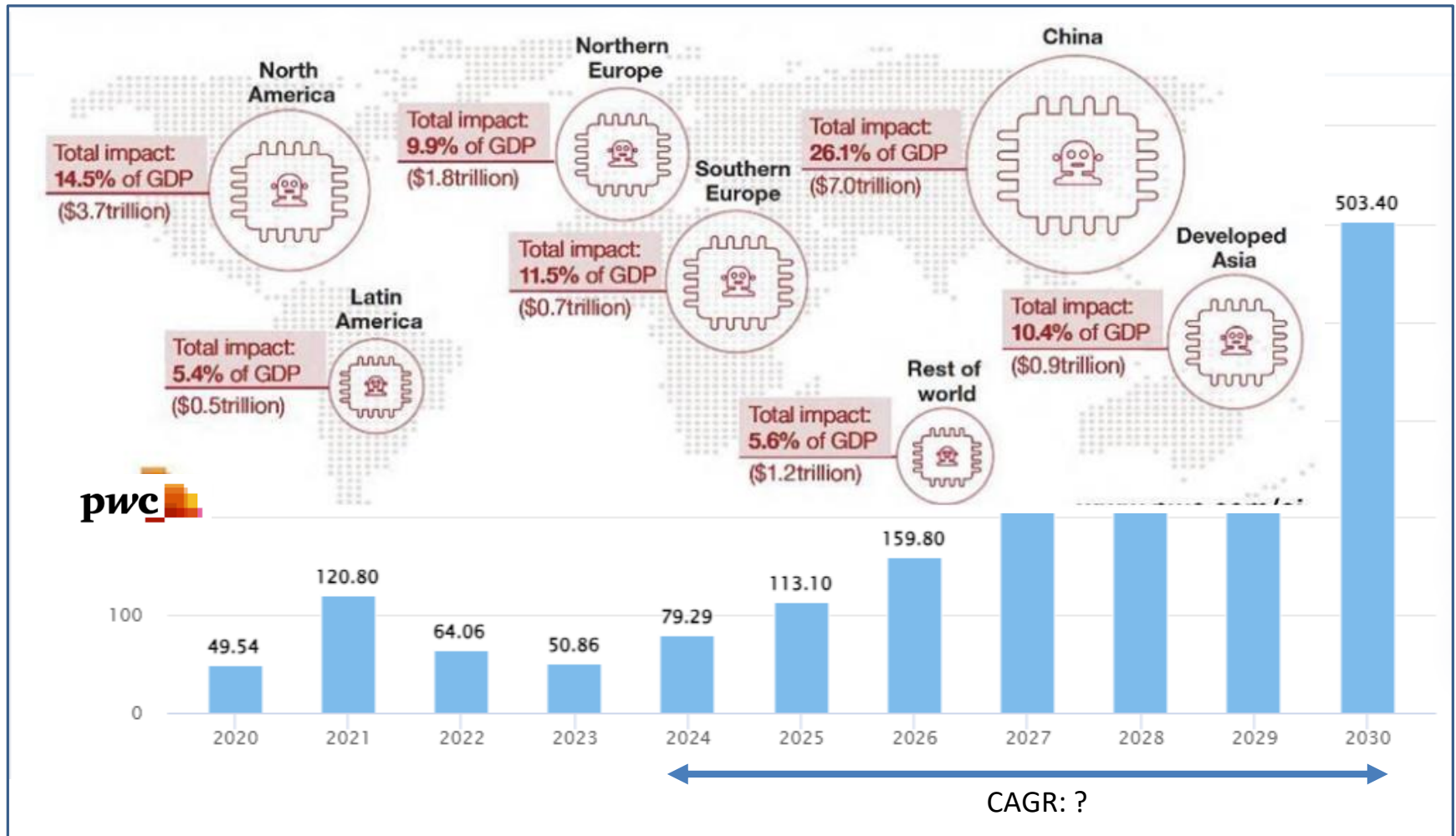
Component	Duration	Date & Time	Weightage	Nature of Component
Mid-Semester Exam	90 mins	08/10/2024 (9.30am-11.00am)	25%	Closed Book
Home Assignments/ Projects (coding)	5 to 6 nos.	1 to 2 assignments every month for 4 months (Aug to Nov).	30%	Open Book
Two announced quizzes	30 mins each	13/09 (5:00pm to 5:30pm) 14/11 (5:00pm to 5:30pm)	10%	Open Book
Comprehensive Exam	3 Hrs	11/12/2024 (FN)	35%	Closed Book

Note: 1. Minimum **40%** of the evaluation component will be conducted before the mid semester grading.

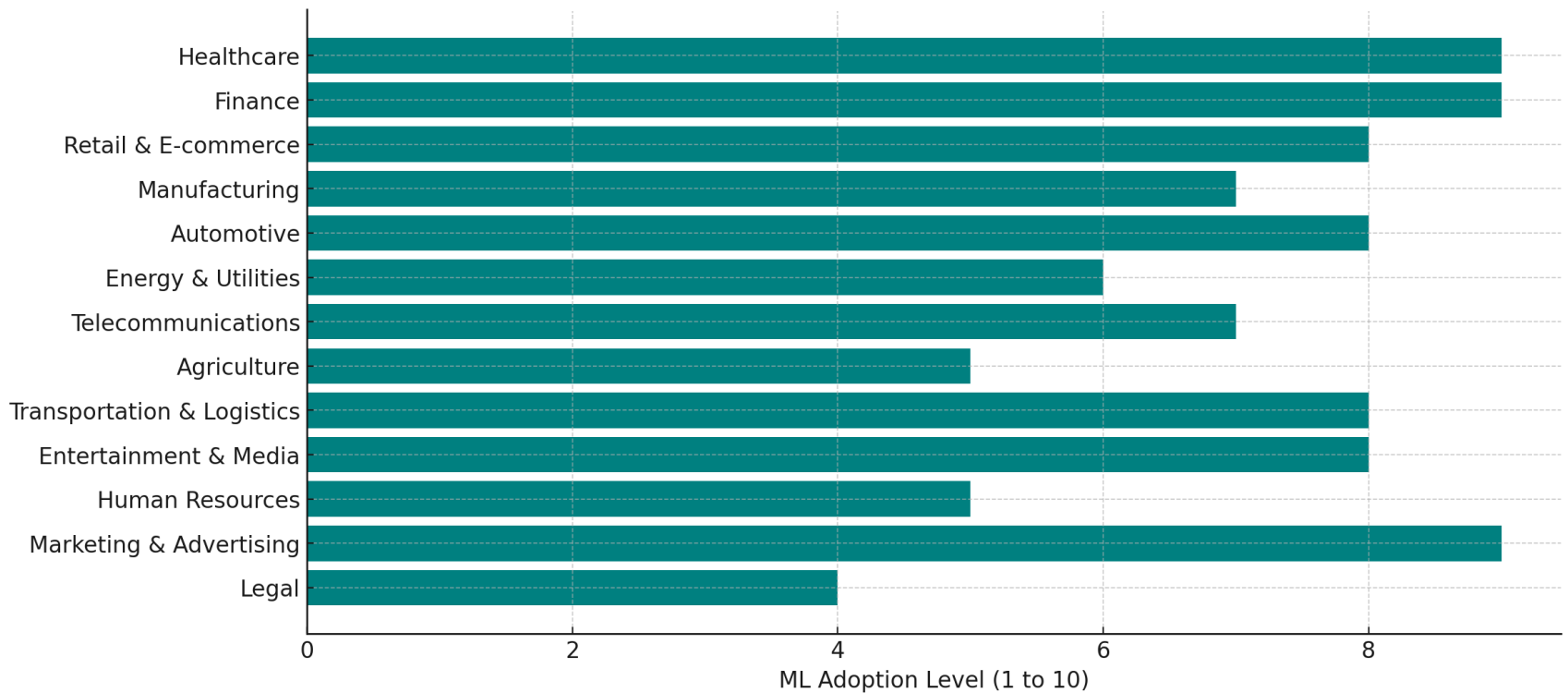
2. Chamber consultation hour: **Tuesday 5:00 pm to 6:00 pm** (H-137).

3. Notices: All notices about the course will be put on the google class.

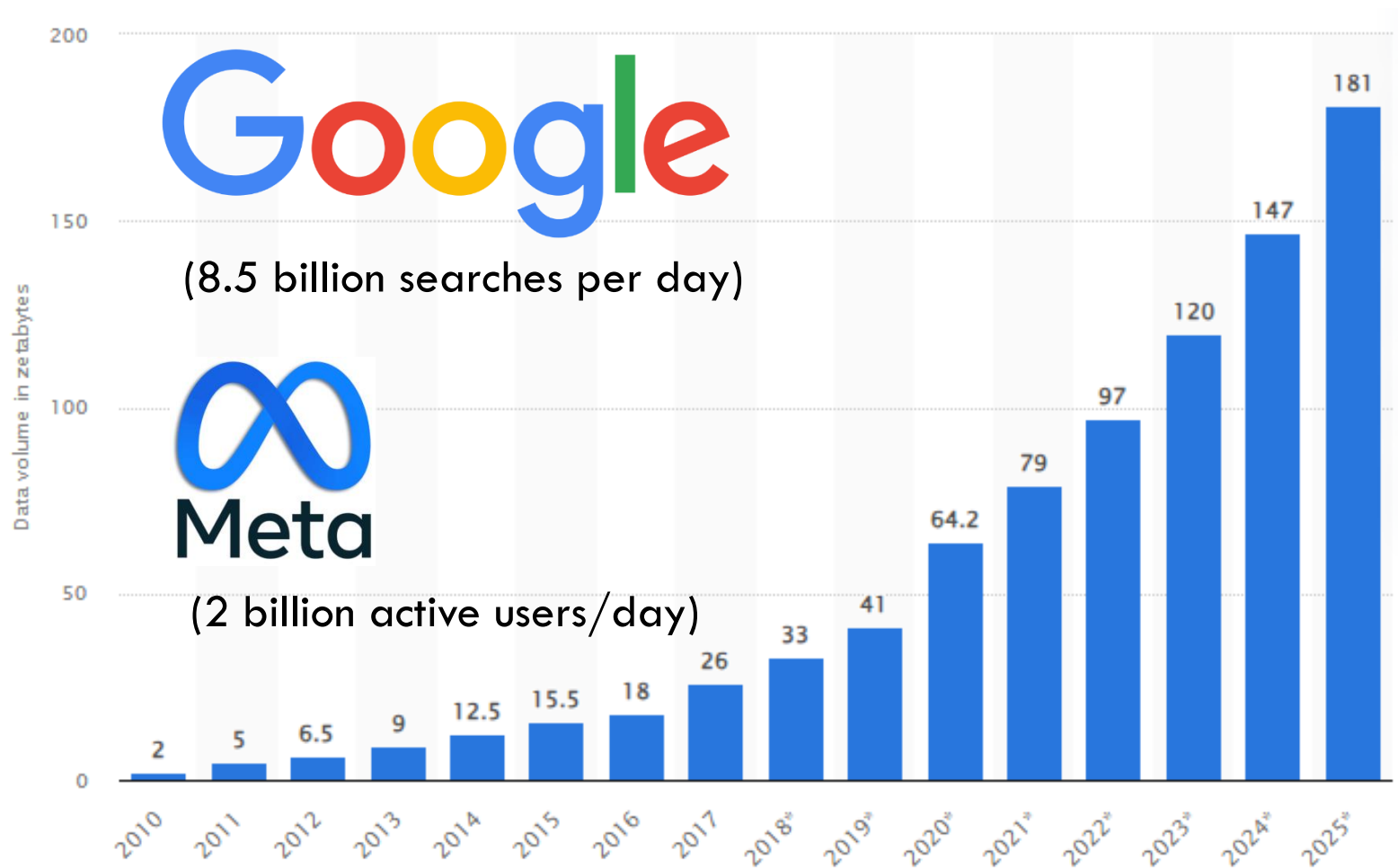
Machine Learning Worldwide



Machine Learning Adoption: Industries



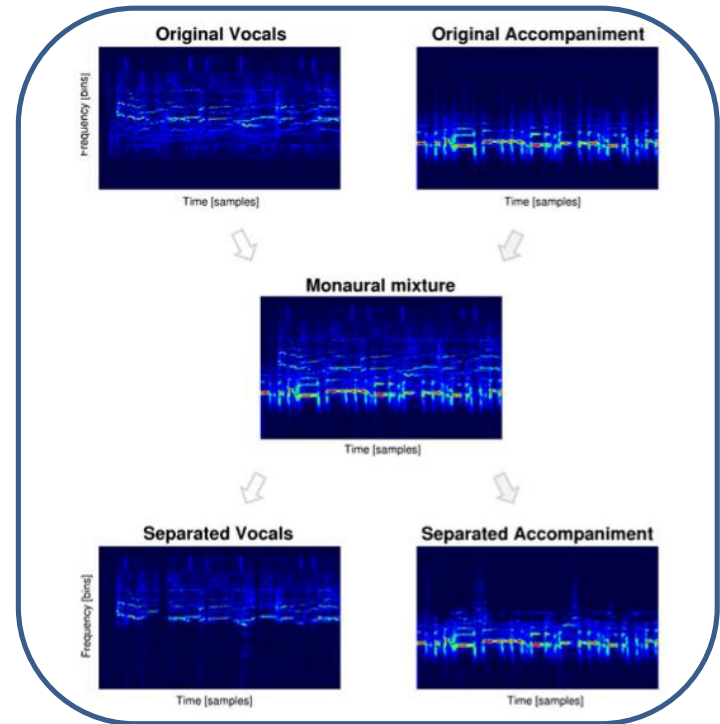
Growth of Data



Why “Learn”?



Img. Source: Josh H. McDermott



(Img. source: Deep Karaoke: Extracting Vocals from Musical Mixtures Using a Convolutional DNN, Andrew Simpson ...)

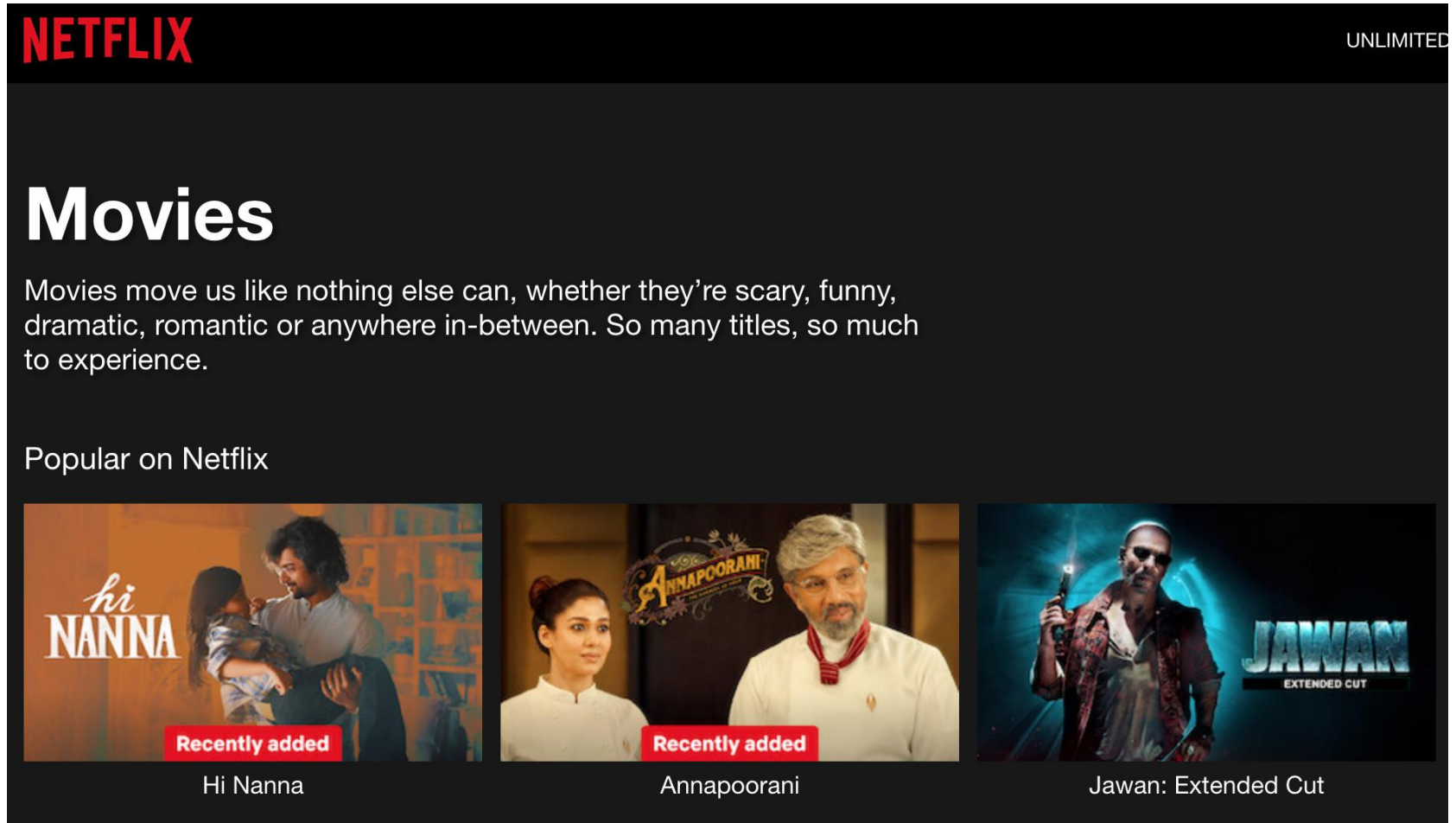
Continued...



How can a Robot cook?

Is it a dog or a fox in the image?

Continued...

A screenshot of the Netflix 'Movies' section. At the top left is the 'NETFLIX' logo in red, and at the top right is the word 'UNLIMITED' in white. Below the logo is the word 'Movies' in large white font. A paragraph of text follows: 'Movies move us like nothing else can, whether they're scary, funny, dramatic, romantic or anywhere in-between. So many titles, so much to experience.' Underneath is the heading 'Popular on Netflix'. Three movie posters are displayed in a row. The first poster is for 'Hi Nanna', showing a man holding a child, with a red 'Recently added' tag at the bottom. The second poster is for 'Annapoorani', showing a woman and a man, with a red 'Recently added' tag at the bottom. The third poster is for 'Jawan: Extended Cut', showing a man with a gun, with the title 'JAWAN' and 'EXTENDED CUT' at the bottom.

NETFLIX UNLIMITED

Movies

Movies move us like nothing else can, whether they're scary, funny, dramatic, romantic or anywhere in-between. So many titles, so much to experience.

Popular on Netflix

Hi Nanna
Recently added

Annapoorani
Recently added

JAWAN
EXTENDED CUT

Hi Nanna Annapoorani Jawan: Extended Cut

Recommender System

Continued...

The screenshot shows a search engine interface with the query 'mahatma gandhi'. The search results are displayed in a grid format. The top row features a large black and white photograph of Mahatma Gandhi with his hands in a prayer position, and a smaller image of a portrait of Gandhi with a colorful background. The second row includes a blue-tinted image of Gandhi's torso, a snippet from MKGandhi.org titled 'MAHATMA GANDHI ONE SPOT COMPLETE INFORMATION ...', and a snippet from The Indian Express titled 'Mahatma Gandhi: Get Latest News Updates, Life History, Facts'. To the right of these images is a summary box containing biographical information: 'Born 2 October 1869 Porbandar' and 'Assassinated 30 January 1948, Birla House, New...'. The search interface also includes navigation tabs for 'All', 'Images', 'Videos', 'News', 'Maps', and 'More', along with a 'Tools' section.

mahatma gandhi

About 10,00,00,000 results (0.52 seconds)

Mahatma Gandhi

Indian lawyer

Overview History Books Education Movies Products

ullstein bild Dtl./ullstein bild via Getty Images

ahatma Gandhi

MKGandhi.org

MAHATMA GANDHI ONE SPOT COMPLETE INFORMATION ...

World's most visited, popular and comprehensive Mahatma Gandhi information website, well-worth...

The Indian Express

Mahatma Gandhi: Get Latest News Updates, Life History, Facts

Mahatma Gandhi. Mohandas Karamchand Gandhi, popularly known as Mahatma...

Born

2 October 1869

Porbandar

Assassinated

30 January 1948, Birla House, New...

Information Retrieval

Artificial Intelligence: Good Old Days

```
Welcome to

EEEEEE LL      IIII  ZZZZZZ  AAAAA
EE      LL      II     ZZ     AA  AA
EEEEEE LL      II     ZZ     AAAAAA
EE      LL      II     ZZ     AA  AA
EEEEEE LLLLLL  IIII  ZZZZZZ  AA  AA
```

Eliza is a mock Rogerian psychotherapist.
The original program was described by Joseph Weizenbaum in 1966.
This implementation by Norbert Landsteiner 2005.

ELIZA: Is something troubling you ?
YOU: Men are all alike.
ELIZA: What is the connection, do you suppose ?
YOU: They're always bugging us about something or other.
ELIZA: Can you think of a specific example ?
YOU: Well, my boyfriend made me come here.
ELIZA: Is it important to you that your boyfriend made you come here ?
YOU: He says I'm depressed much of the time.
ELIZA: I am sorry to hear that you are depressed.
YOU: It's true. I am unhappy.
ELIZA: Can you explain what made you unhappy ?
YOU:

Eliza
the first NLP computer program

1964-66: MIT AI Lab



Shakey
the world's first electronic person

1966-72: Stanford Research Institute

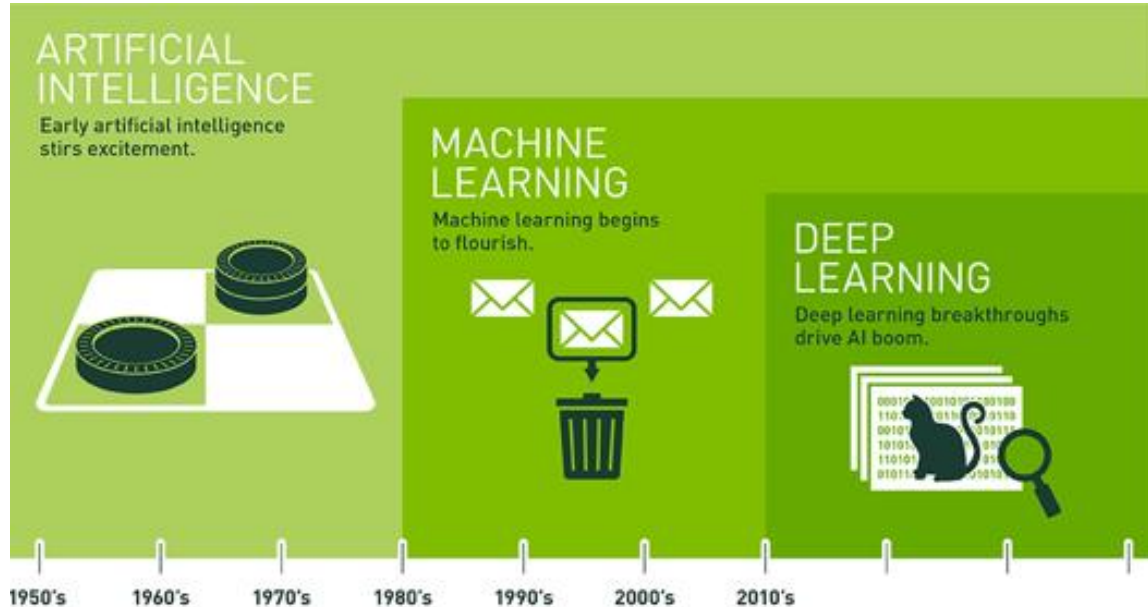
Kasparov Vs Deep Blue



Img. Source: <https://www.britannica.com/>

Moving from Artificial to Real Intelligence

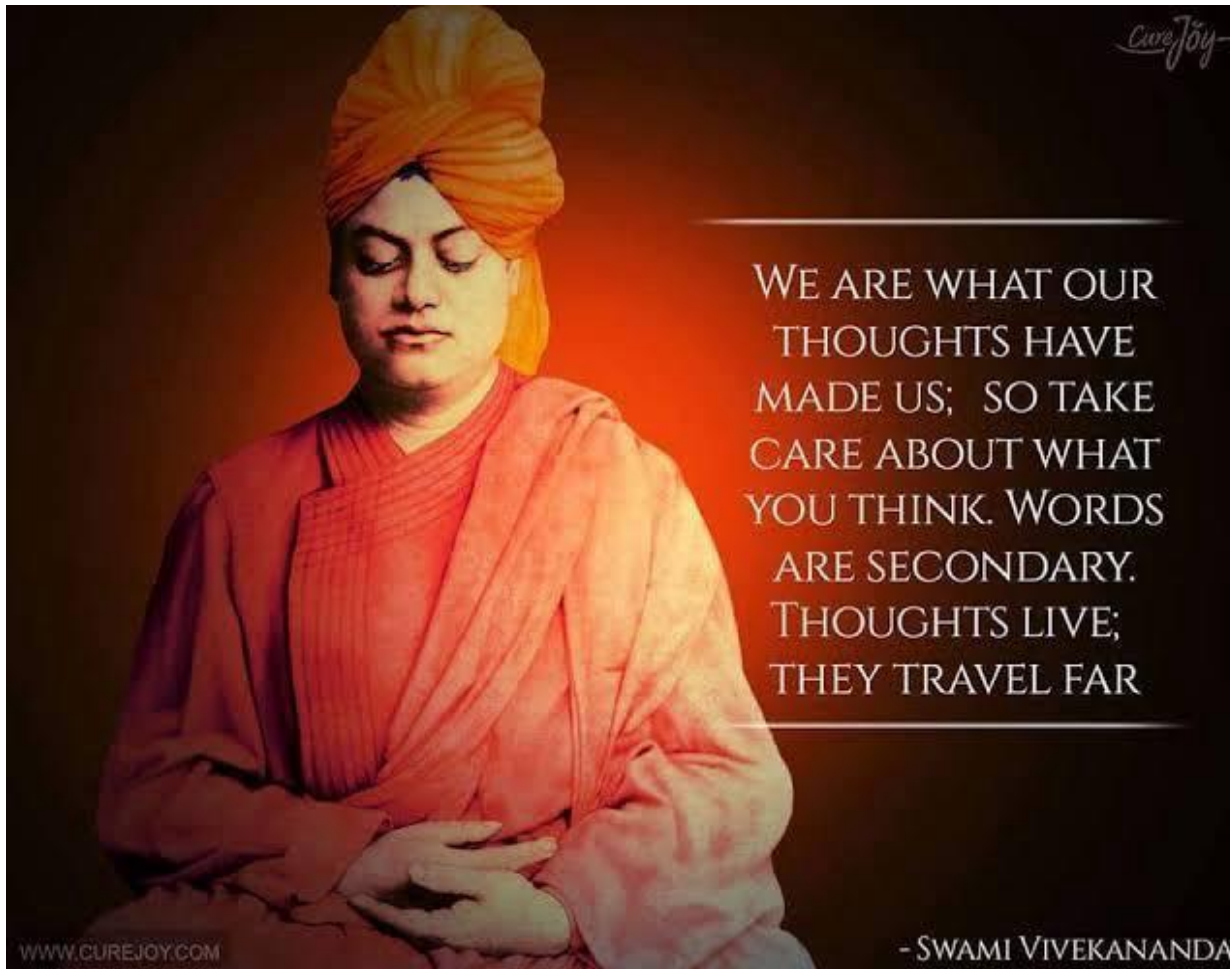
Hyderabad to Dwarka travel plan: Let me do it through a digital machine (Computer).
AI



It is difficult to program this computer to make it understand what I want it to do. Let it do it by itself using right structure and a set of examples. ML

I do not know how to make this computer understand what I know. Let it create its' own structure and figure out the data for itself. DL

Recap: What is Intelligence?



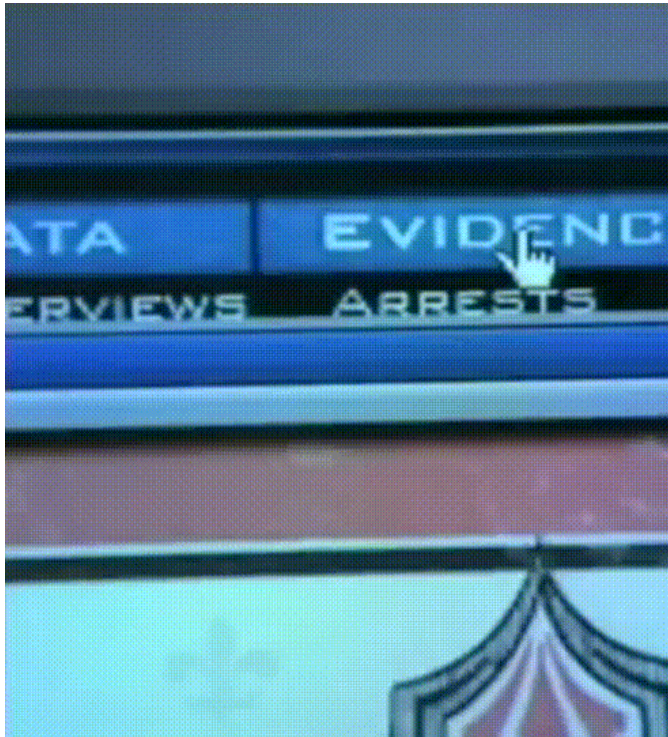
Can you give
some
examples of
Intelligent
Applications?

Food for Intelligent Behaviour: Data, Training & Testing Examples, Algorithms and Models, Resources, Human Expertise, ...

Recap: Why “Learn”?

- Do we need to “learn” to calculate Payroll?
 - Learning is used when:
 - Human expertise does not exist (ISRO’s Chandrayaan 3).
 - Humans are unable to explain their expertise (Speech recognition, Cocktail party communication).
-

Computer Vision



Crime Scene Investigation: TV Serial

 H A N S O N
R O B O T I C S

Self Driving Cars



Source: <https://www.ri.cmu.edu/>

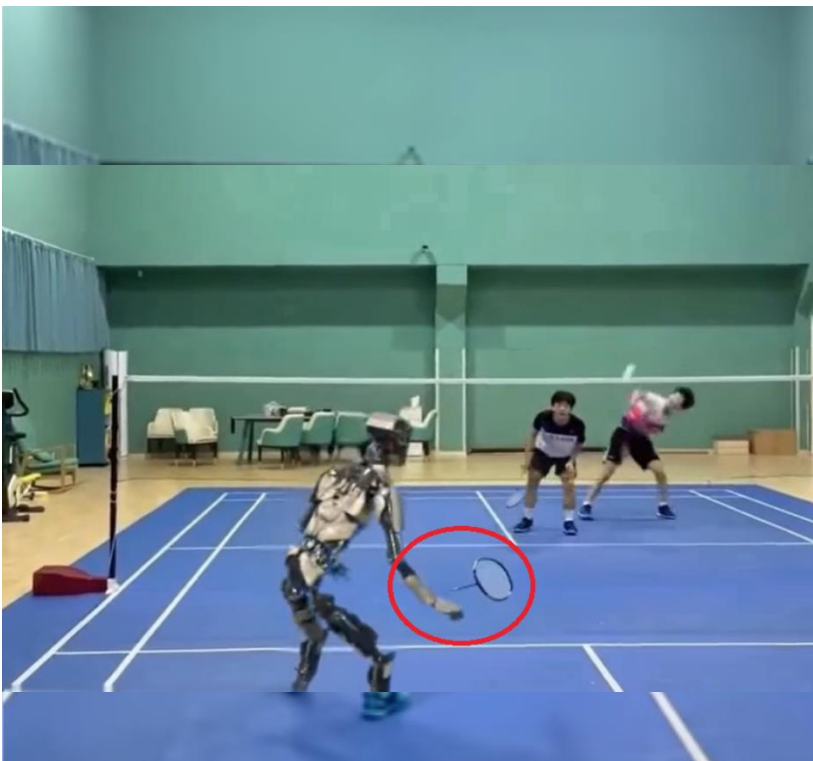


Source: <https://developer.nvidia.com/>

US Cities: Arizona, Phoenix, San Francisco, Texas Austin, Los Angeles, Miami, Pittsburgh

Deepfake

Generative AI (Ability to generate new content): CNNs, GANs, Auto-encoders, Transformers, ...



 **Elon Musk**  
@elonmusk · [Follow](#)



This is amazing 😄



4:41 AM · Jul 27, 2024



 **936.1K**  [Reply](#)  [Share](#)

Large Language Models (LLMs)

Hi! Hello, I am a friendly dialog model. What do you want to talk about?

What's a good topic for a new blog?

Well there are so many! How about something about a new food item that you just tried.

There are lots of food blogs. How can I make it unique?

Hmmm, you can write about a food that you tried somewhere that is exclusive to that location or restaurant.

Sounds expensive. Can you give me a low budget food blog idea?

Well you could write something about a food that you make on a budget or maybe something about how to shop for food if you have a limited income.

Not a bad idea, but still not special enough. What will really make it stand out.

You could do it as a video blog. Just take pictures of you cooking and add text as you go.

Hi! I am Mount Everest. What would you like to know about me?

Why do people climb you?

Some people want to show others they could do it, others enjoy the hike and the scenery, and then some people just want to see the world.

Who was the first?

Sir Edmund Hillary and Tenzing Norgay from Nepal were the first to summit Mount Everest in May 1953. They were joined by several others at different times in the successful attempt.

What can I do to prepare for climbing you?

Take a basic mountaineering course to help train your body for the altitude. Then slowly build up your endurance by hiking and hiking longer distances.

Thanks! You're a very polite mountain!

Oh, thank you. That is very sweet of you to say that. I like to hear that people think nicely of me.



NAMED 'THE ORON,' THE AI-EQUIPPED JET DETECTS DRONES, BALLISTIC MISSILES, AND AIRCRAFT



Many more...

- Stock markets and Trading
 - Credit card fraud detection
 - E-mail spam filtering
 - Language translation
 - Virtual personal assistants
 - Banking and Finance
 - Healthcare
 - Transportation and traffic prediction
 - Manufacturing industry
 - Human resource management
-

Thank You!
