

Overview - Machine Learning

10 February 2024 20:37

Q: How would you explain machine learning to 5 year old kid??

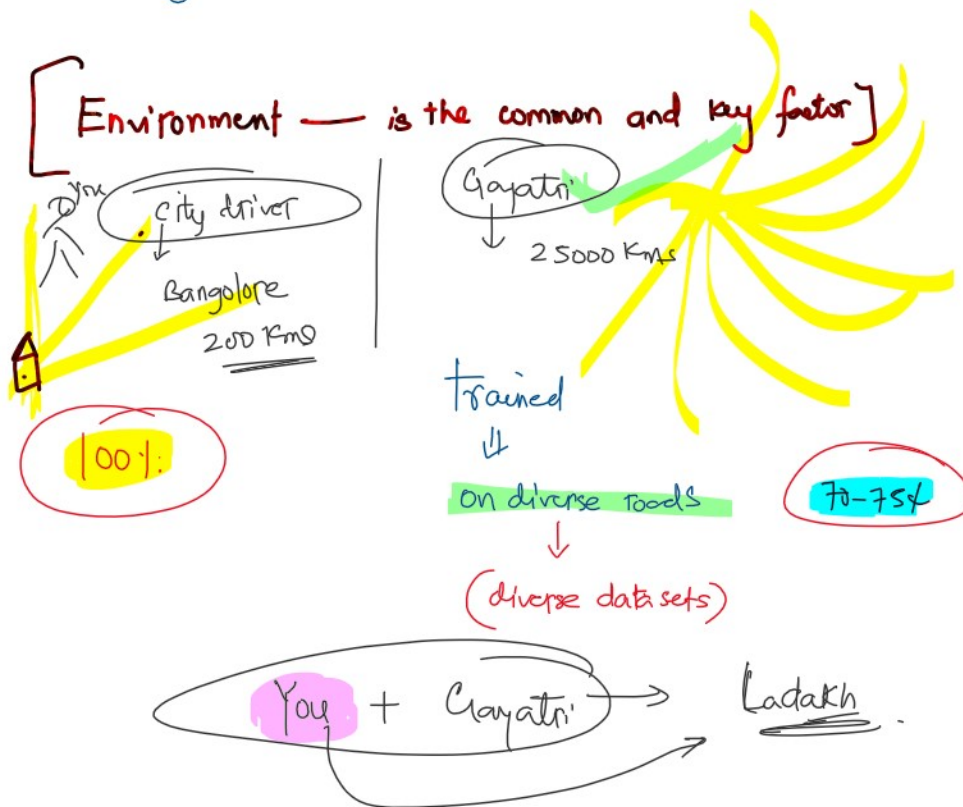
Baby →
0-12 months → walking
12-24 months → talking

Brain

- is the most sophisticated and complicated machine learning algorithms
- (Neural Network)

Driving:

cycling (accustomed)
car



(ML + optimization + Simulation)

Google Newsstand



India Today
COP28 Dubai Big Failure: Why Countries Can't Agree On Phasing Out Fossil Fuels
10 hours ago

(Clustering)
+
1110



India Today
COP28 Dubai Big Failure: Why Countries Can't Agree On Phasing Out Fossil Fuels
10 hours ago

European Commission
Daily News 13/12/2023
15 hours ago

The Financial Express
A balanced consensus: Despite scepticism, UAE has delivered a balanced package on climate action at COP28
3 hours ago • Opinion • Chandra Bhushan

$\left(\begin{matrix} + \\ \text{NLP} \end{matrix} \right)$

Business Standard

Making history, COP28 nations agree to 'transition away' from fossil fuels

9 hours ago • Shreya Jai

Full coverage

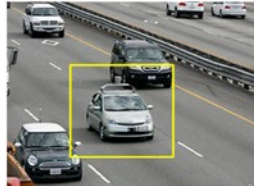
{ Alexa | Google Home | Siri # etc }

↳ (NLP + NLG)

(AI based camera) ✓✓

Tesla / BYD

Autonomous Cars

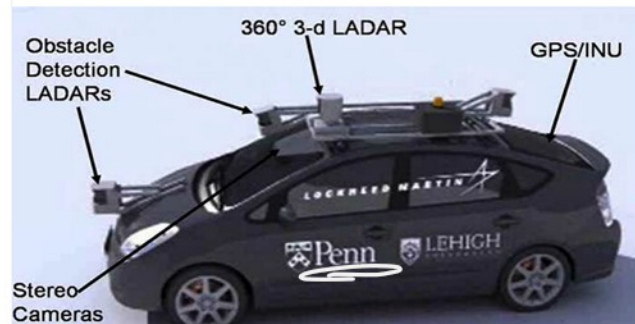


- Nevada made it legal for autonomous cars to drive on roads in June 2011
- As of 2013, four states (Nevada, Florida, California, and Michigan) have legalized autonomous cars

Penn's Autonomous Car → (Ben Franklin Racing Team)

12

Autonomous Car Sensors



which type of model is created in ML for autonomous cars

— COMPUTER VISION

What is Machine Learning?

"Learning is any process by which a system improves performance from experience."

- Herbert Simon

Definition by Tom Mitchell (1998):

Machine Learning is the study of algorithms that

- improve their performance P
- at some task T
- with experience E .

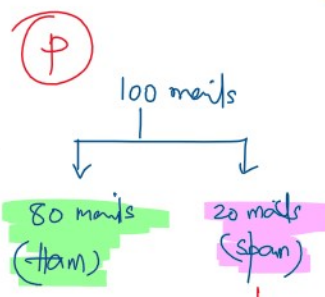
A well-defined learning task is given by $\langle P, T, E \rangle$.

Spam Mail Detection

P : ^{How accurately} Categorize email messages as spam or ham accurately.
— i.e. of email correctly classified, important or not a spam.

T : Spam vs Ham Mail Tagging

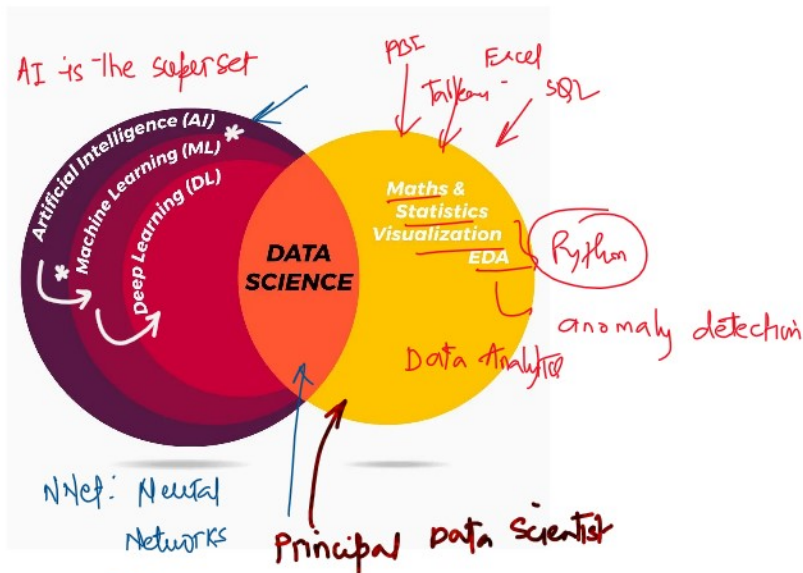
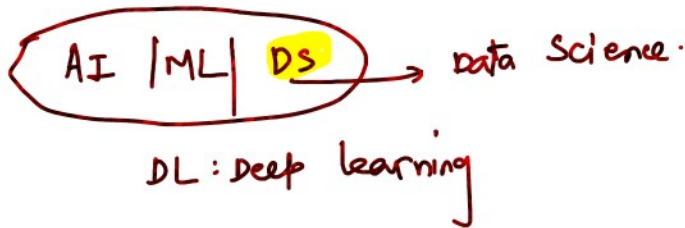
E : Database of emails, + User feedback.



↓
(15 mails were actually spam)
accuracy = $\frac{15}{20} \times 100 = \underline{\underline{75\%}}$

Reading Assignment :

① How does GMAIL classify mail as spam vs ham?



Key areas of Machine Learning

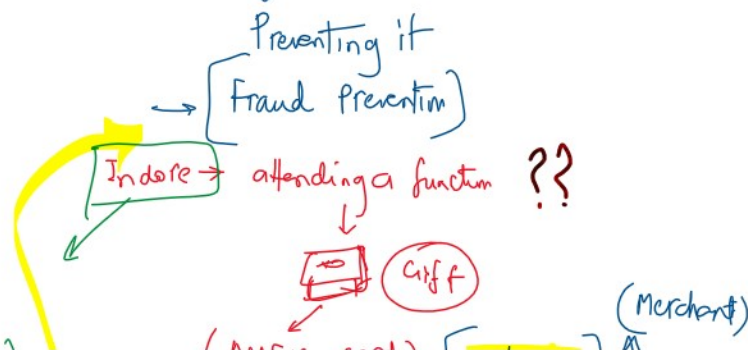
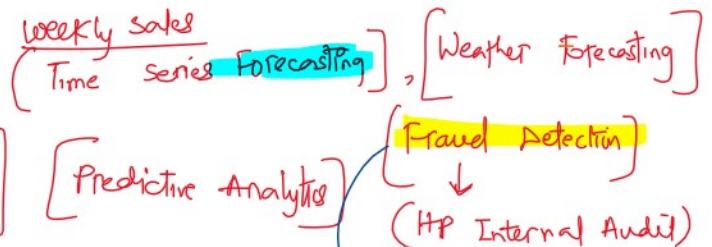
30% **Prediction** — Machine learning can also be used in the prediction systems. Considering the loan example, to compute the probability of a default, the system will need to classify the available data in groups.

10% **Image recognition** — Machine learning can be used for face detection in an image as well. There is a separate category for each person in a database of several people.

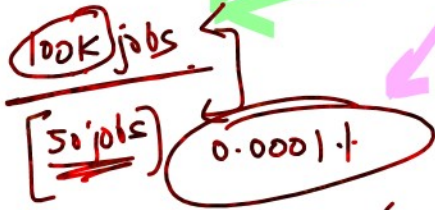
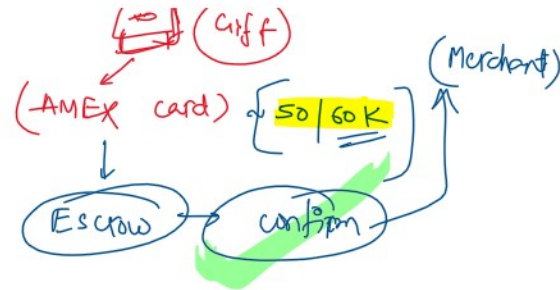
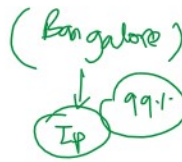
Speech Recognition — It is the translation of spoken words into the text. It is used in voice searches and more. Voice user interfaces include voice dialing, call routing, and appliance control. It can also be used a simple data entry and the preparation of structured documents.

Medical diagnoses — ML is trained to recognize cancerous tissues.

Financial industry and trading — companies use ML in fraud investigations and credit checks.



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(100 or 80 units or 0 units)

A How much product 'X', walmart store will be selling in the next week?

let us say product 'X' is a new product!

B Whether product 'X' will sell or not??

Yes No (Binary)

Supervised Learning

Regression

A

Classification

B

How much \Rightarrow Regression

Whether Yes/No \Rightarrow Classification

"supervised learning" \rightarrow 90% of good data scientists

Making AI helpful for everyone



Improve knowledge
and learning



Boost creativity
and productivity



Enable others
to innovate



Build and
responsibility



News / Health And Wellness / Google AI tool for retinal scan can predict cardiovascular risk

Premium

Google AI tool for retinal scan can predict cardiovascular risk

The technology could reveal the heart's health condition after matching the eye scans with a matrix for cardiovascular risks. The algorithm has proved to be correct in 70 per cent of the cases where it has been tested so far.

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