

Why AI is awesome: A friendly introduction

Elyes Manai



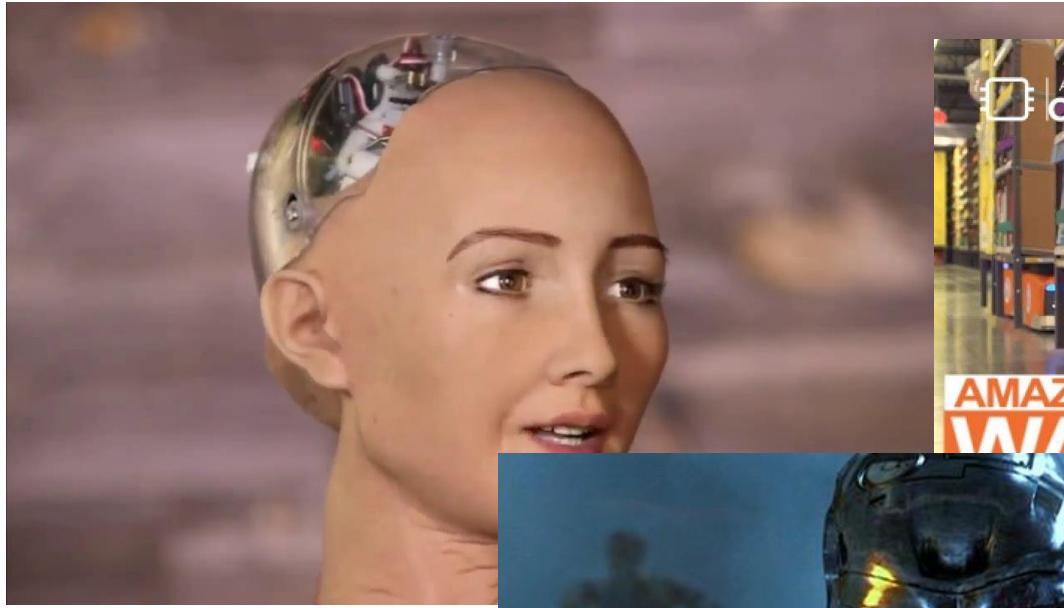


Research Masters in
Artificial Intelligence



Elyes Manai







Google
Translate

Break through language barriers.





5 DAY FORECAST

REGION 1

MON	TUE	WED	THU	FRI
32 20	25 12	22 15	18 9	12 3

Sent Mail

Spam (372)



Trash



Feed
Business Strategy
Daily
q/biz



Startups
Hiring



Computer
Programmers



Rules and
Guidelines



Tips and Hacks



13.89	+5.34%	593.23	300,000
45.34	-7.89%	251.23	120,000
17.34	+5.97%	100.08	320,000
34.89	+2.13%	564.23	900,000
16.45	+6.43%	765.90	600,000
23.67	-11.6%	120.34	380,000
34.64	+23.1%	893.23	120,000
43.69	+5.56%	128.98	320,000
12.78	-3.67%	756.00	750,000
12.44	+11.3%	765.23	150,000
		432.24	120,000
			300,000



Elyes Manai
What is your question or link?

Answer · Personal Experiences · Topic you might like

What has someone said to you that literally made your jaw drop?



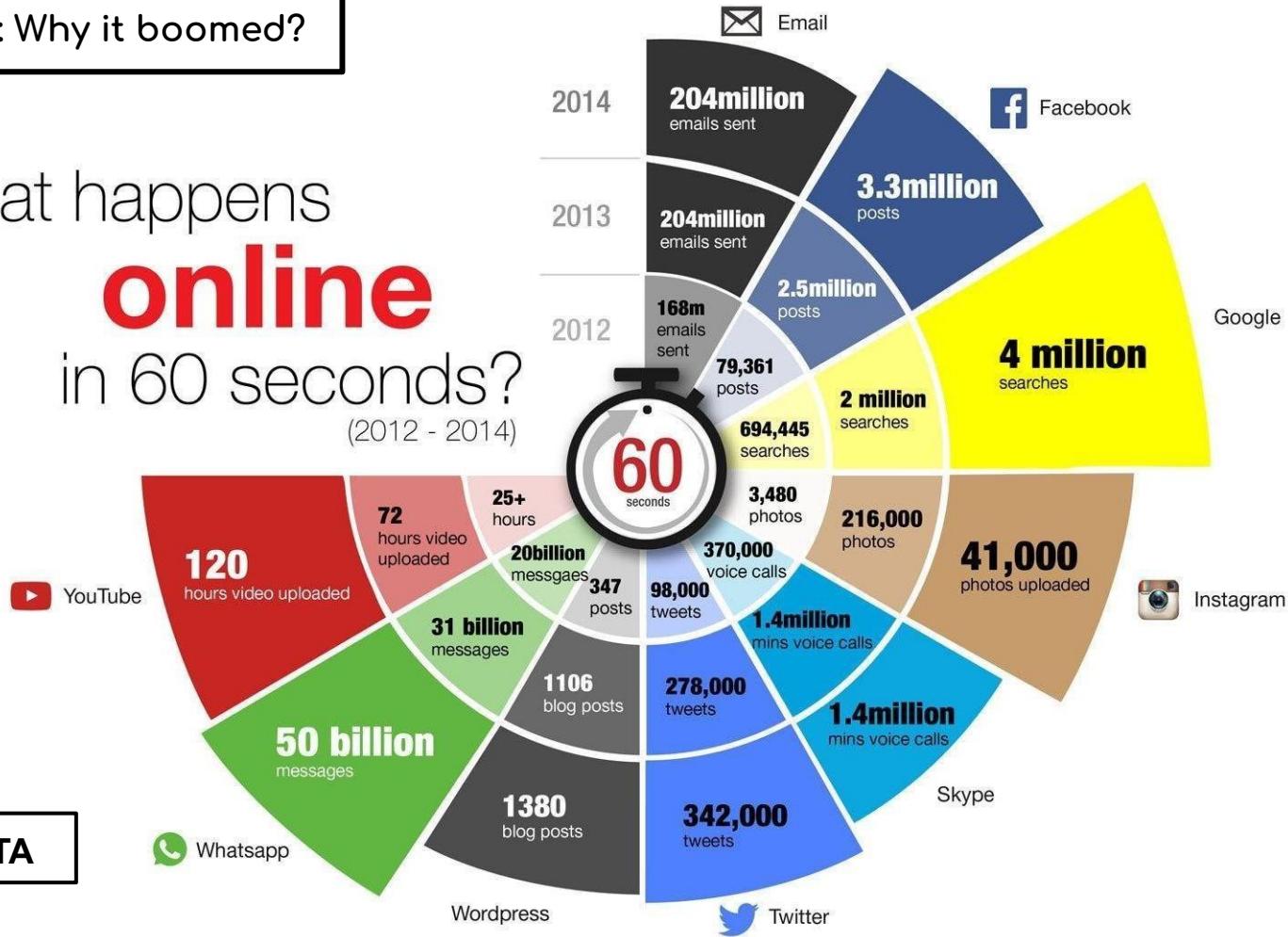
Hunter McCann, Graphic designer living in Canada

Answered 1h ago

Years ago I was sitting in a coffee shop with my close female friend, who happened to be newly engaged to my cousin and was in town to see him. My cousin was only around 20 years old at the time and... (more)

MOTIVATION: Why it boomed?

What happens
online
in 60 seconds?
(2012 - 2014)



This is Big DATA



Data Scientist Salaries

3,703 Salaries Updated Dec 14, 2018

About This Data ?

Industries lock ▼

Company Sizes lock ▼

Years of Experience lock ▼

info To continue using salary filters, please contribute. [Write a Review](#) or [Add a Salary](#)

Average Base Pay

\$139,840 /yr



Additional Cash Compensation ?

Average \$xx,xxx

How much does a Data Scientist make?
The national average salary for a Data Scientist is \$139,840 in United States. Filter by location to see... [More](#)

Range \$xx,xxx

Salaries for Related Job Titles

Data Analyst	\$84K
Data Scientist Intern	\$106K
Quantitative Analyst	\$121K
Senior Data Scientist	\$162K

Machine Learning Engineer Salaries

128 Salaries Updated Mar 27, 2019

About This Data ?

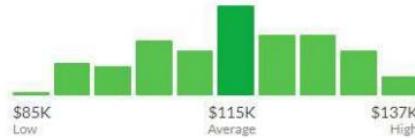
Industries ▼

Company Sizes ▼

Years of Experience ▼

Average Base Pay

\$114,826 /yr



Additional Cash Compensation ?

Average No Reports

Range No Reports

How much does a Machine Learning Engineer make?
The national average salary for a Machine Learning Engineer is \$114,826 in United States. Filter by location to see Machine Learning Engineer salaries in your area. Salary estimates are based on 128 salaries submitted anonymously to Glassdoor by Machine Learning Engineer employees.

Salaries for Related Job Titles

Software Engineer - Machine ...	\$103K
Research Engineer	\$90K
Machine Learning Research Sci...	\$83K
Machine Learning Scientist	\$117K
Research Scientist - Computer ...	\$83K

AI startup: *exists*

Investors:



$$y = \beta X + \varepsilon$$

Statistics

2009

$$y = \beta X + \varepsilon$$

MACHINE
LEARNING

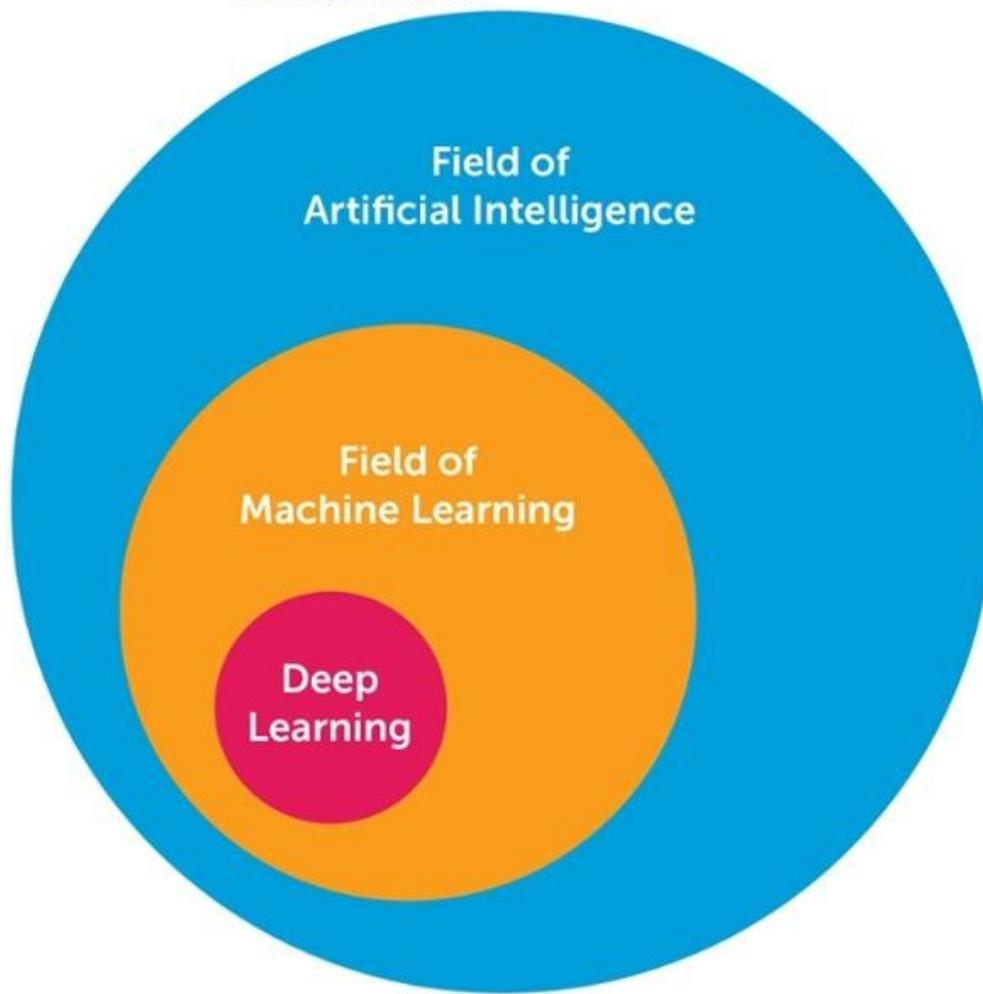
2019





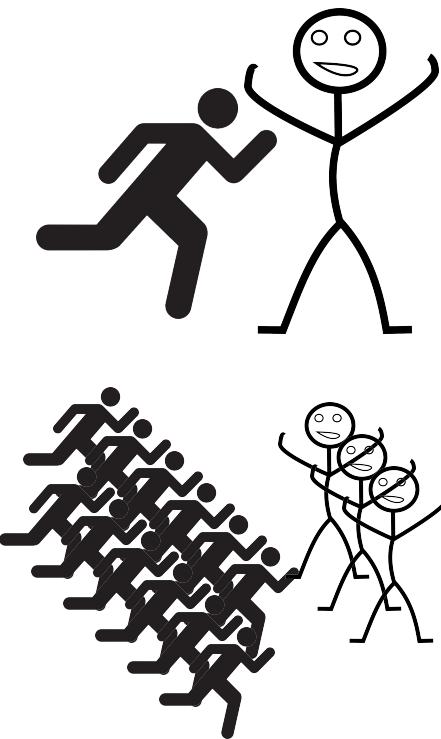
Nikola Tesla
PHD in Quantum Computing
Researcher in Artificial Intelligence

DATA SCIENCE



Artificial Intelligence

Traditional Way



Computer Science

- Function 1:**
Lorem ipsum
- Function 2:**
Lorem ipsum
- Function 3:**
Lorem ipsum
- Function 4:**
Lorem ipsum
- Function 5:**
Lorem ipsum
- Function 6:**
Lorem ipsum

Machine Learning



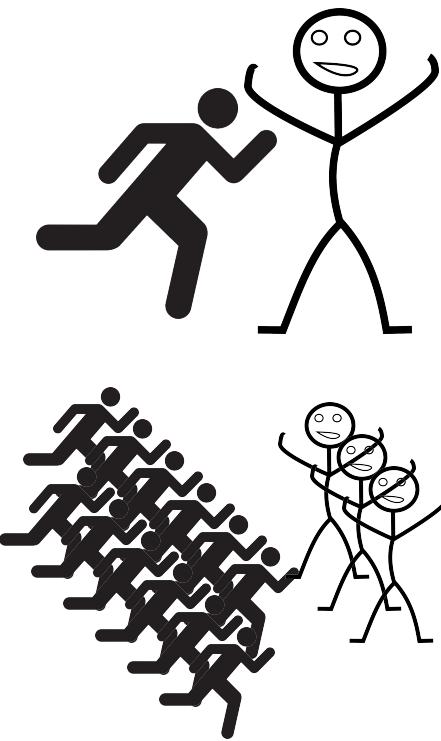
Deep Learning



HACKERMAN

Artificial Intelligence

Traditional Way



Computer Science

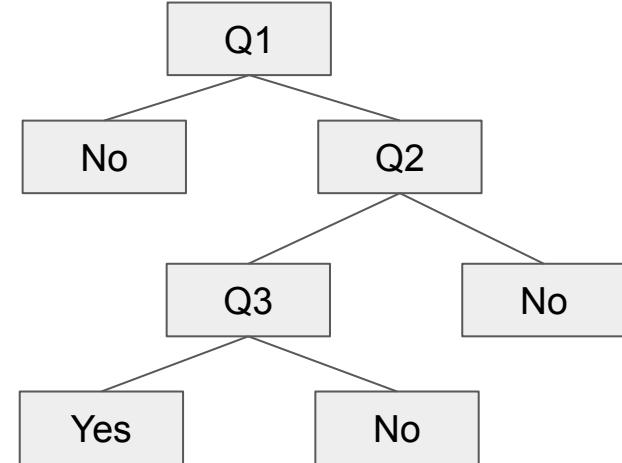
- Function 1:**
Lorem ipsum
- Function 2:**
Lorem ipsum
- Function 3:**
Lorem ipsum
- Function 4:**
Lorem ipsum
- Function 5:**
Lorem ipsum
- Function 6:**
Lorem ipsum



Machine Learning

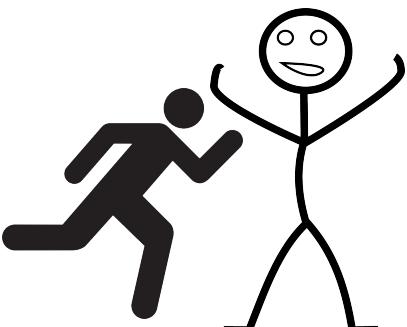
Name	Age	Salary	Jail	Prev?	Verdict
elyes	22	800	no	no	yes
amal	21	1200	no	yes	yes
omar	45	2500	yes	yes	no
Nour	37	350	no	no	no
3abd	kbir	3andou	lotf	lotf	no

Deep Learning



Artificial Intelligence

Traditional Way



Computer Science

Function 1:
Lorem ipsum
Function 2:
Lorem ipsum
Function 3:
Lorem ipsum
Function 4:
Lorem ipsum

Machine Learning

Name	Age	Salary	Jail	Prev?	Verdict
elyes	22	800	no	no	yes
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Nour	37	350	no	no	no
3abd	kbir	3andou	lotf	lotf	no

Deep Learning

Q1

Name	Age	Salary	Jail	Prev?	Feature	Verdict													
elyes	22	800	no	no	value	yes													
amal	21	1200	no	yes	value	yes													
omar	45	2500	yes	yes	value	no													
Nour	37	350	no	no	value	no													
3abd	kbir	3andou	lotf	lotf	value	no													
value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	
value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	

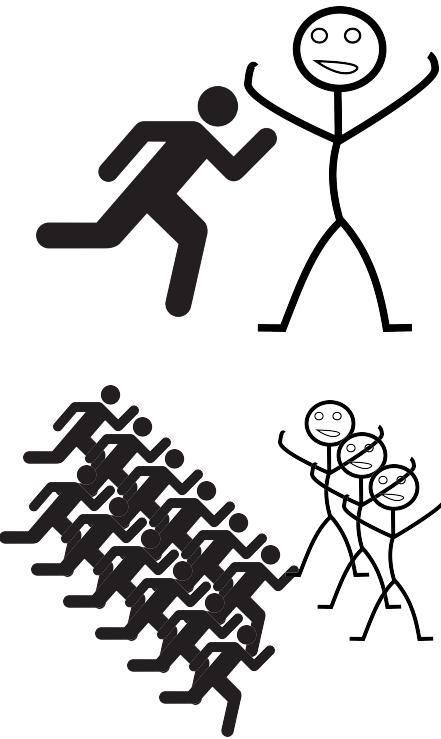
Yes

No



Artificial Intelligence

Traditional Way



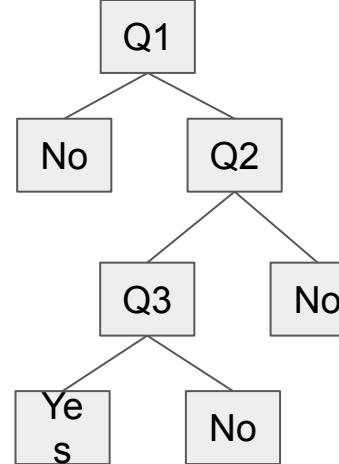
Computer Science

- Function 1:**
Lorem ipsum
- Function 2:**
Lorem ipsum
- Function 3:**
Lorem ipsum
- Function 4:**
Lorem ipsum
- Function 5:**
Lorem ipsum
- Function 6:**
Lorem ipsum



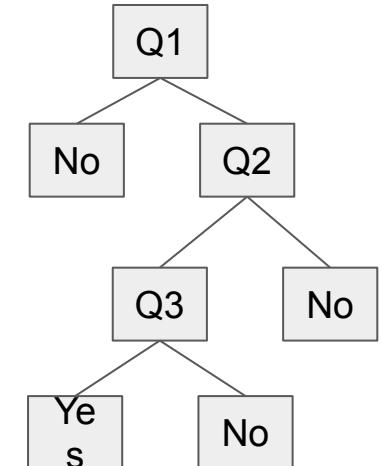
Machine Learning

Name	Age	Salary	Jail	Prev?	Verdict
elyes	22	800	no	no	yes
amal	21	1200	no	yes	yes
omar	45	2500	yes	yes	no
Nour	37	350	no	no	no
3abd	kbir	3andou	loff	loff	no



Deep Learning

Name	Age	Salary	Jail	Prev?	Feature 1	Feature 2	Feature 3	Feature 4	Feature 5	Feature 6	Feature 7	Feature 8	Feature 9	Feature 10	Feature 11	Feature 12	Feature 13	Feature 14	Feature 15	Feature 16	Feature 17	Feature 18	Feature 19	Feature 20	Verdict
elyes	22	800	no	no	value	value	value	value	value	value	value	value	value	yes											
amal	21	1200	no	yes	value	value	value	value	value	value	value	value	value	yes											
omar	45	2500	yes	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	no		
Nour	37	350	no	no	value	value	value	value	value	value	value	value	value	no											
3abd	kbir	3andou	loff	loff	value	value	value	value	value	value	value	value	value	no											
					value	value	value	value	value	value	value	value	value	value											



Machine Learning

Name	Age	Salary	Jail	Prev?	Verdict
elyes	22	800	no	no	yes
amal	21	1200	no	yes	yes
omar	45	2500	yes	yes	no
Nour	37	350	no	no	no
3abd	kbir	3andou	lotf	lotf	no

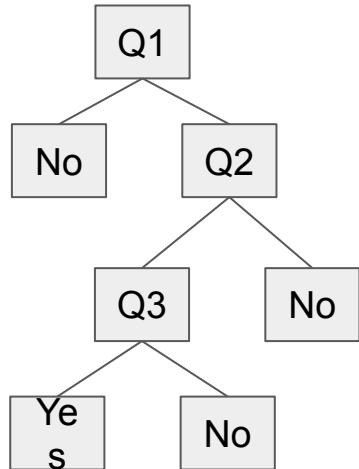
$$Y = W_1 * \text{Feature1} + W_2 * \text{Feature2} + W_3 * \text{Feature3} + W_4 * \text{Feature4} + W_5 * \text{Feature5}$$

$$Y = 0.01 * F_1 + 0.2 * F_2 + 0.8 * F_3 + 0.6 * F_4 + 0.7 * F_5 = 0.7$$

If $Y > 0.6$ then Verdict → Yes
Else Verdict → No

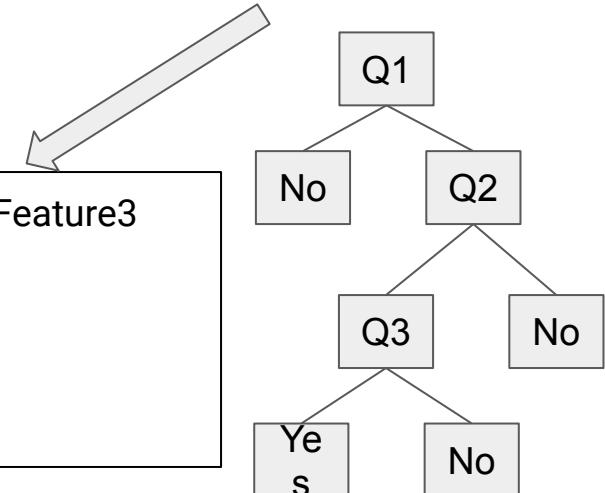
Deep Learning

Name	Age	Salary	Jail	Prev?	Feature1	Feature2	Feature3	Feature4	Feature5	Feature6	Feature7	Feature8	Feature9	Feature10	Feature11	Feature12	Feature13	Feature14	Feature15	Feature16	Feature17	Feature18	Feature19	Feature20	Verdict
elyes	22	800	no	no	value	value	value	value	value	value	value	value	value	yes											
amal	21	1200	no	yes	value	value	value	value	value	value	value	value	value	yes											
omar	45	2500	yes	yes	value	value	value	value	value	value	value	value	value	no											
Nour	37	350	no	no	value	value	value	value	value	value	value	value	value	no											
Sabot	10r	3andou	lotf	lotf	value	value	value	value	value	value	value	value	value	no											
value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value		
value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value	value		



$$Y = W_1 * \text{Feature1} + W_2 * \text{Feature2} + W_3 * \text{Feature3} + W_4 * \text{Feature4} + W_5 * \text{Feature5} + \dots + W_{100} * \text{Feature100}$$

If $Y > 0.6$ then Verdict → Yes
Else Verdict → No





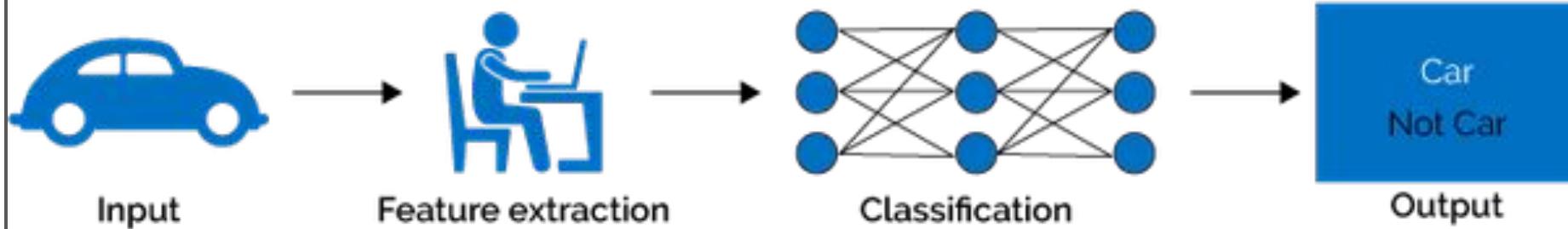
**WHEN NETWORK IS
GETTING TRAINED**

Trains the model for 2.8 hours

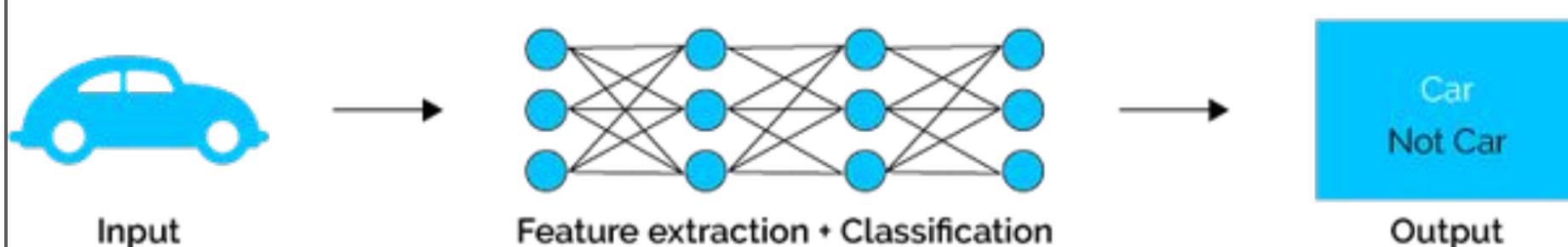


forgets to save the weights to the disk

Machine Learning

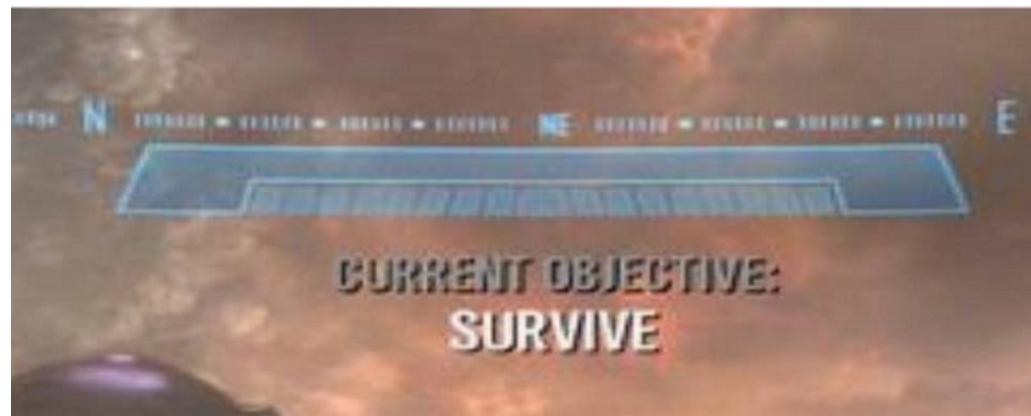


Deep Learning

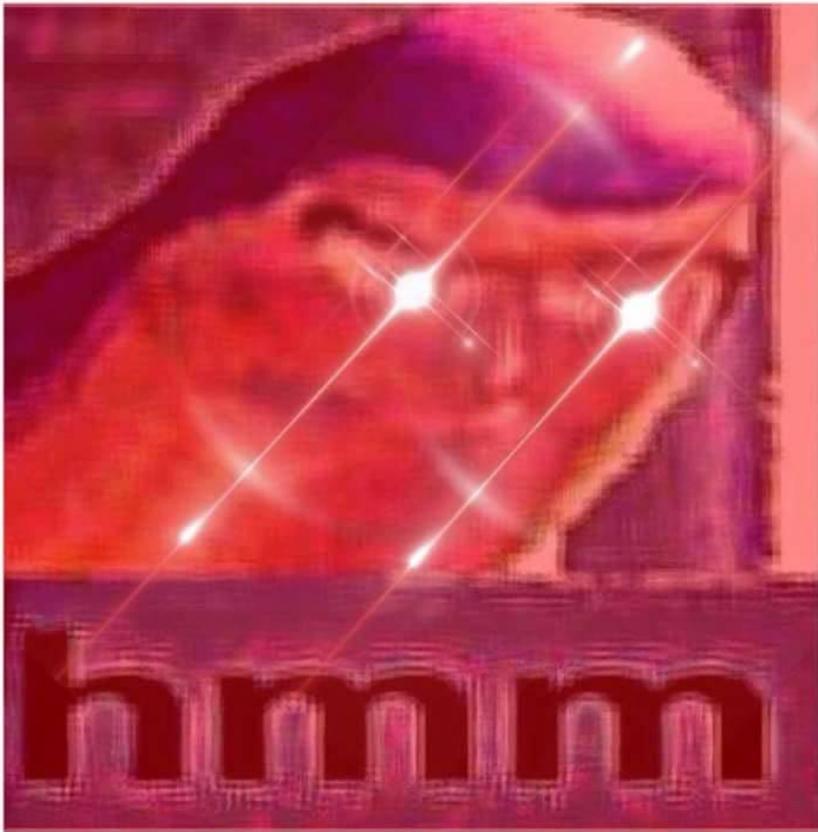


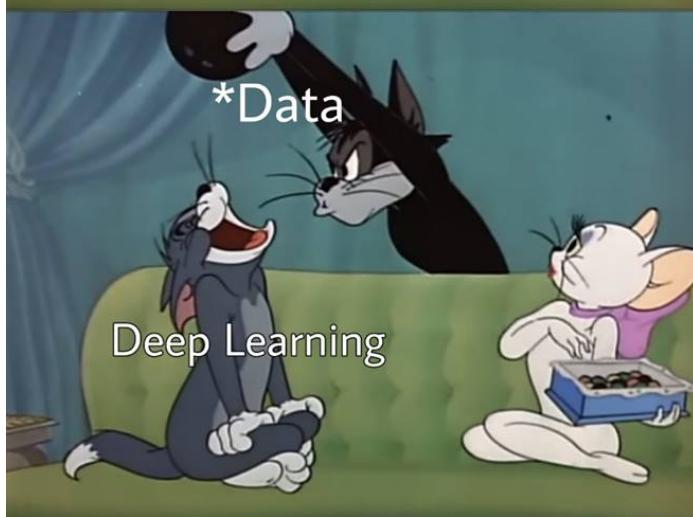
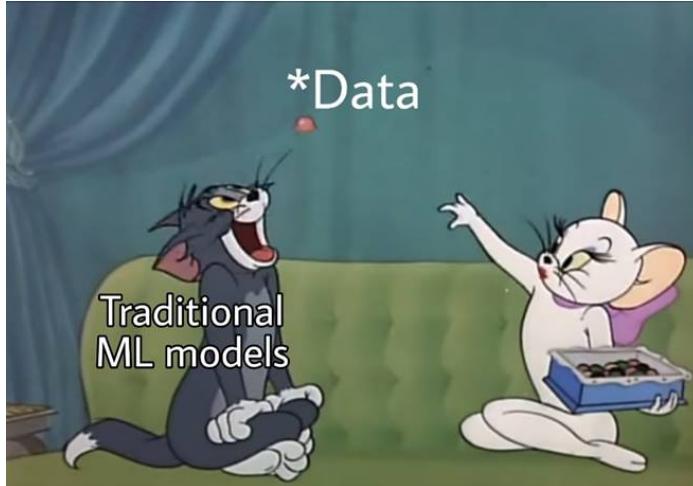


Training a neural net on a CPU



GPUs: *exist*
Deep Learning niggas





**Waiting for my deep learning
model to finish training**

Artificial Intelligence

Traditional Way



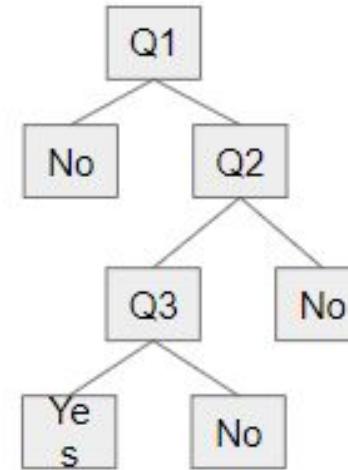
Computer Science

- Function 1:** Lorem ipsum
- Function 2:** Lorem ipsum
- Function 3:** Lorem ipsum
- Function 4:** Lorem ipsum
- Function 5:** Lorem ipsum
- Function 6:** Lorem ipsum

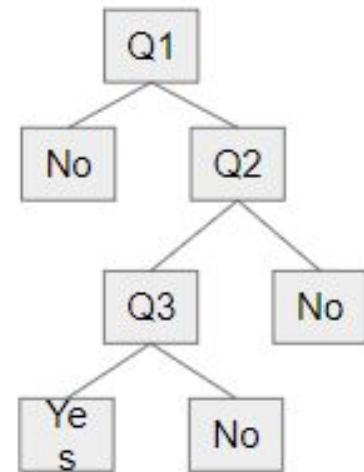
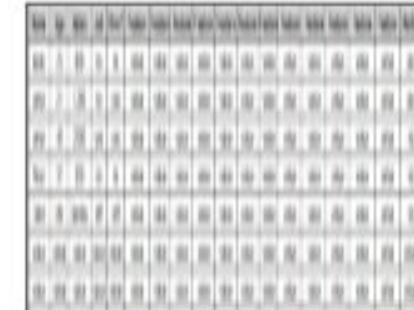


Machine Learning

Name	Age	Salary	Jail	Prev?	Verdict
e1yes	22	800	no	no	yes
amal	21	1200	no	yes	yes
omar	45	2500	yes	yes	no
Nour	37	350	no	no	no
3abd	kbir	3andou	lotf	lotf	no



Deep Learning



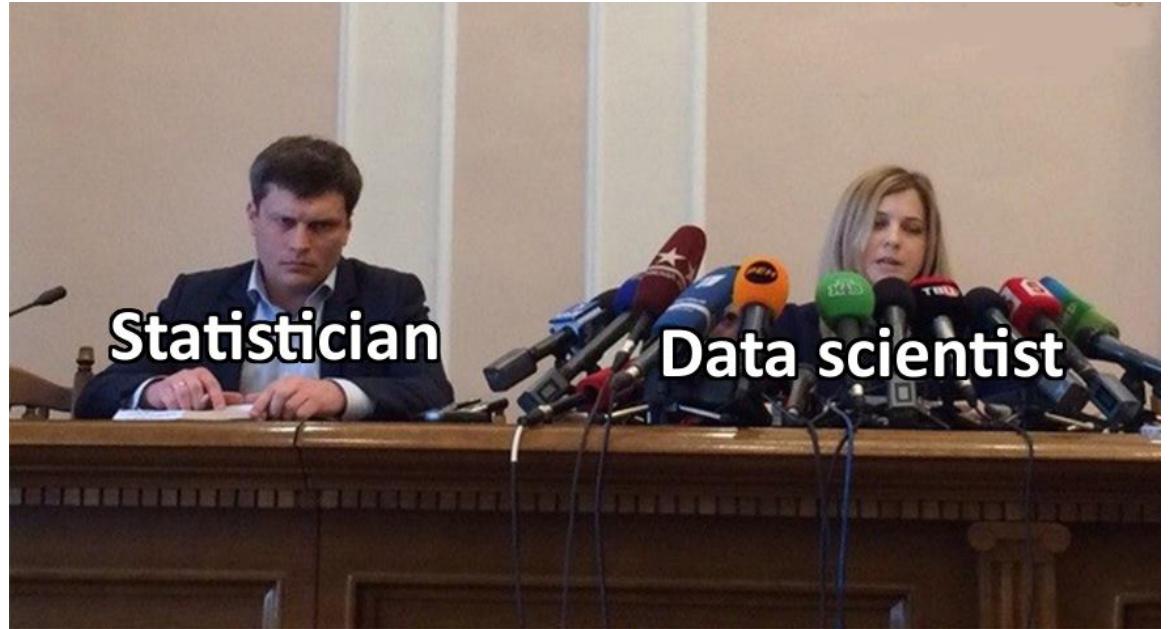
DATA SCIENCE

Field of
Artificial Intelligence

Field of
Machine Learning

Deep
Learning

Math





BREAK

Machine Learning

Supervised

Name	Age	Salary	Jail	Prev?	Verdict
elyes	22	800	no	no	yes
amal	21	1200	no	yes	yes
omar	45	2500	yes	yes	no
Nour	37	350	no	no	no



Labels

Unsupervised

Name	Age	Salary	Jail	Prev?	
elyes	22	800	no	no	
amal	21	1200	no	yes	
omar	45	2500	yes	yes	
Nour	37	350	no	no	
3abd	kbir	3andou	lotf	lotf	



Raw
Data



No
Labels

Reinforcement



Machine Learning

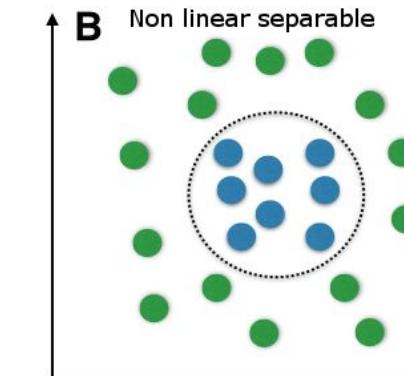
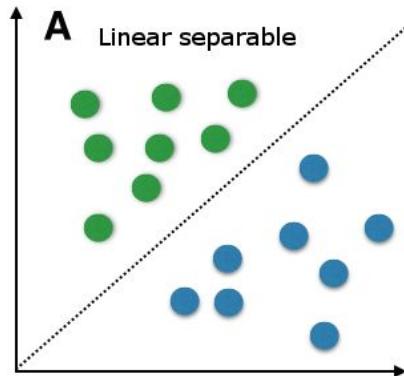
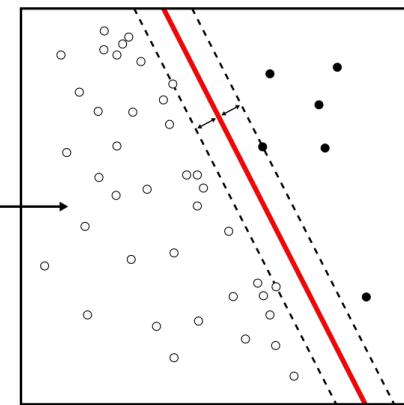
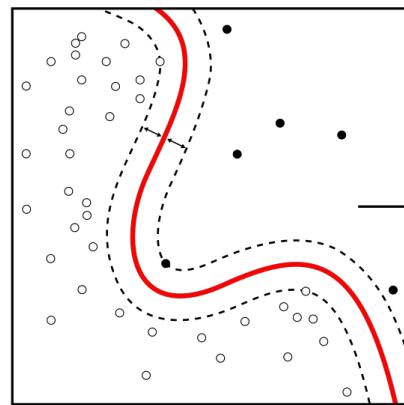
Supervised

Name	Age	Salary	Jail	Prev?	Verdict
elyes	22	800	no	no	yes
amal	21	1200	no	yes	yes
omar	45	2500	yes	yes	no
Nour	37	350	no	no	no

Labels
↑

3abd kbir 3andou lotf lotf no

Classification



Machine Learning

Supervised

Name	Age	Salary	Jail	Prev?	Verdict
elyes	22	800	no	no	yes
amal	21	1200	no	yes	yes
omar	45	2500	yes	yes	no
Nour	37	350	no	no	no



Labels

3abd	kbir	3andou	lotf	lotf	no
------	------	--------	------	------	----

Regression

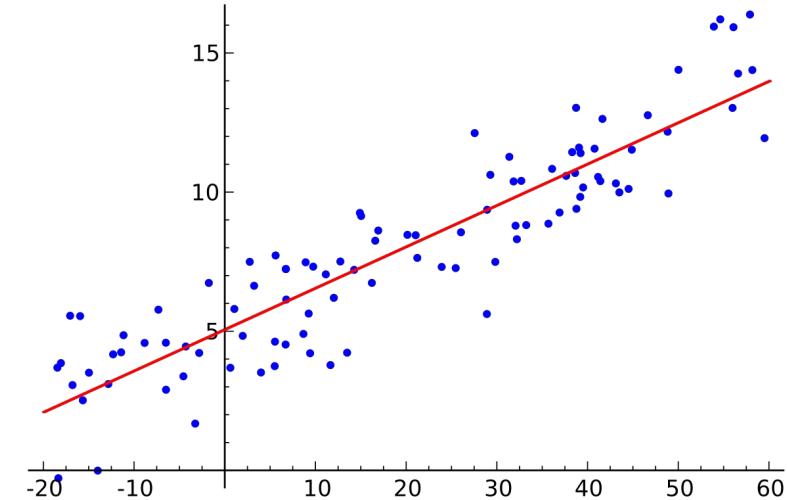
Machine Learning

Supervised

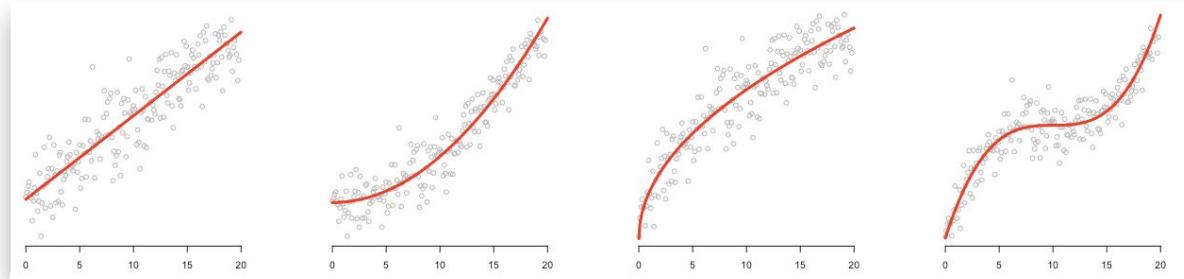
m Carré	S+	Location	Saison	meublé?	Prix Location
250	0	Bardo	été	yes	150
350	1	Manar	hiver	no	200
120	2	Tunis	printemps	yes	123
60	3	Marsa	été	no	230
170	2	Kram	hiver	no	170

↑
Labels

190	1	Nabeul	hiver	Yes	?
-----	---	--------	-------	-----	---



Regression



Machine Learning

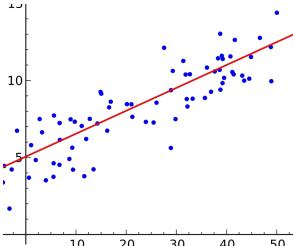
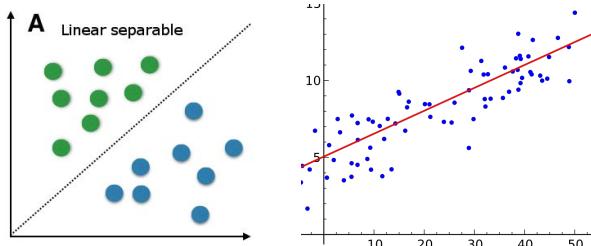
Supervised

Unsupervised

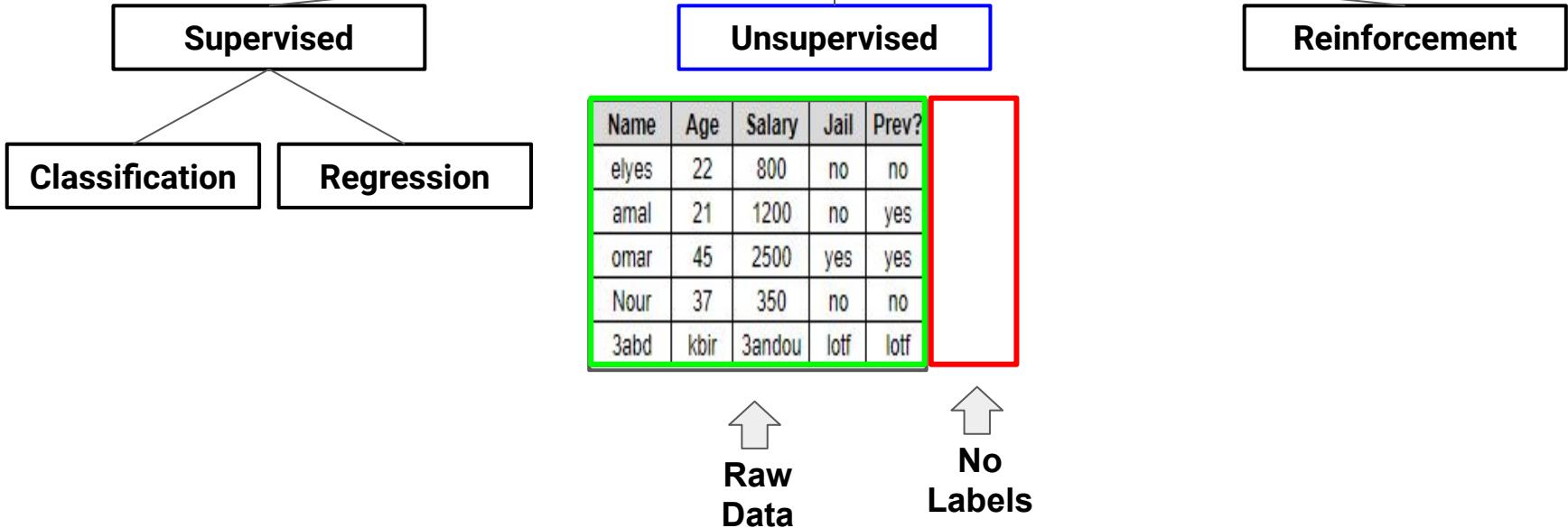
Reinforcement

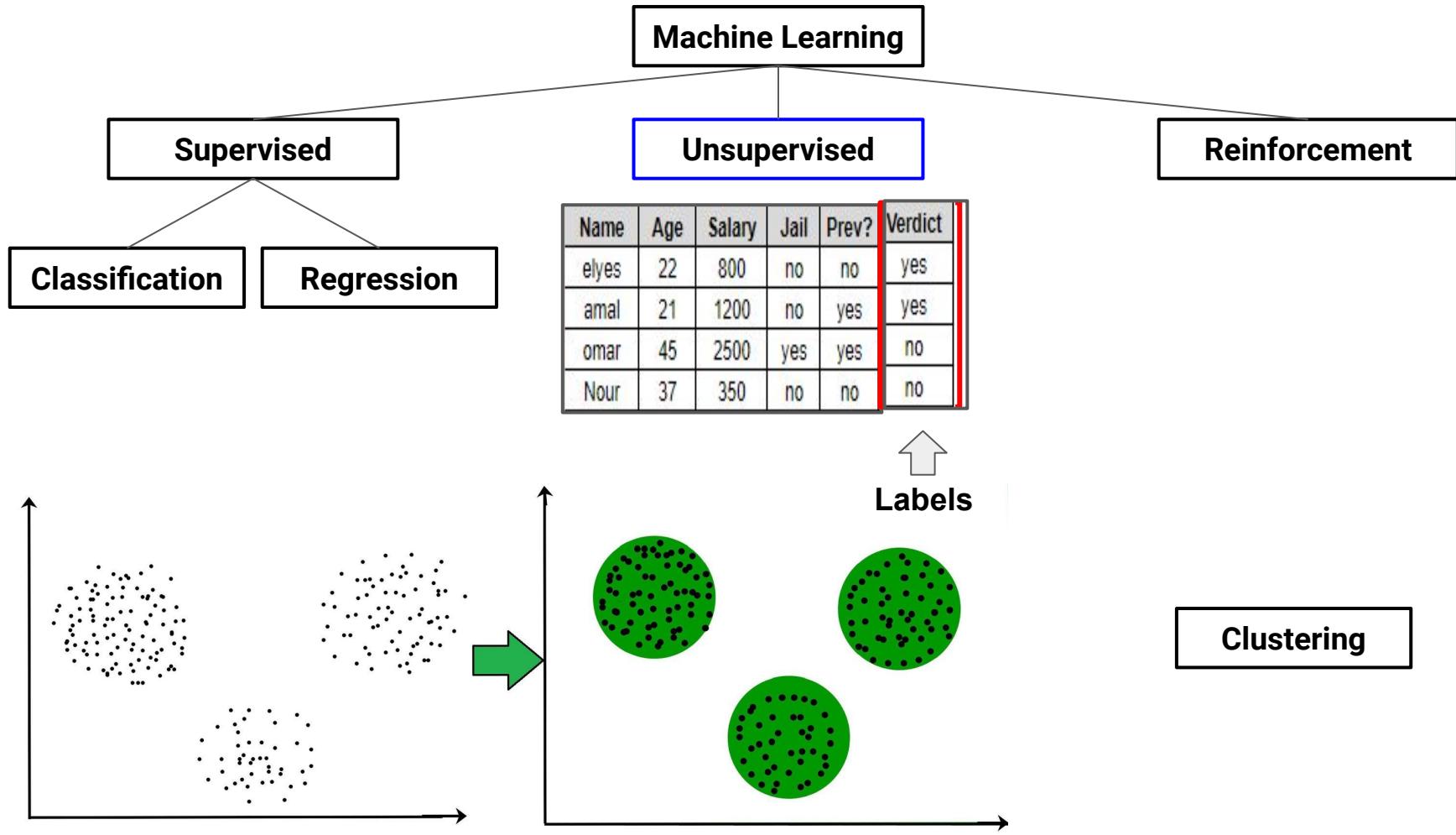
Classification

Regression

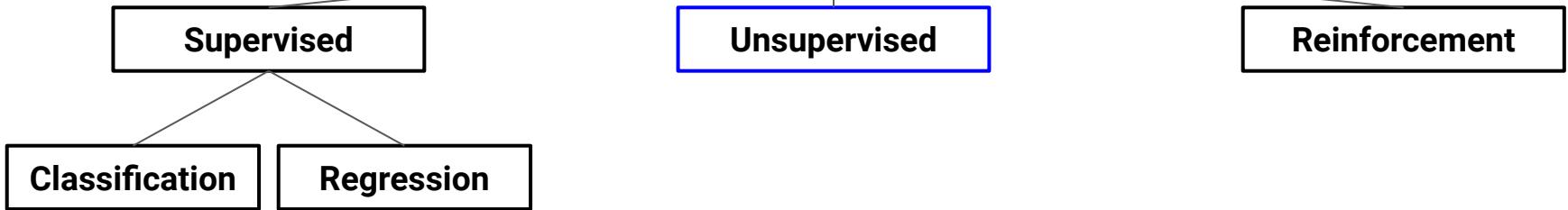


Machine Learning





Machine Learning



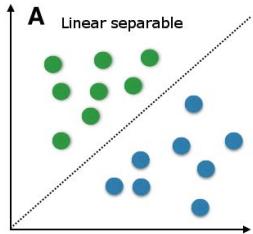
Id commande	items
1	12,15,150
2	18,12,5
3	324,7,10
4	10,24,2,68
5	2
6	12,15,150
7	18,12,5
8	324,7,10
9	10,24,2,68
50000	666

Association
Rule

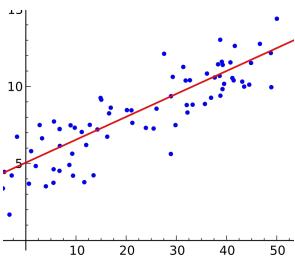
Machine Learning

Supervised

Classification

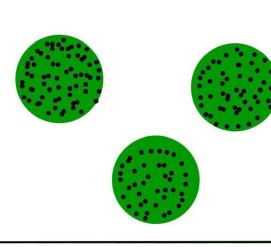


Regression



Unsupervised

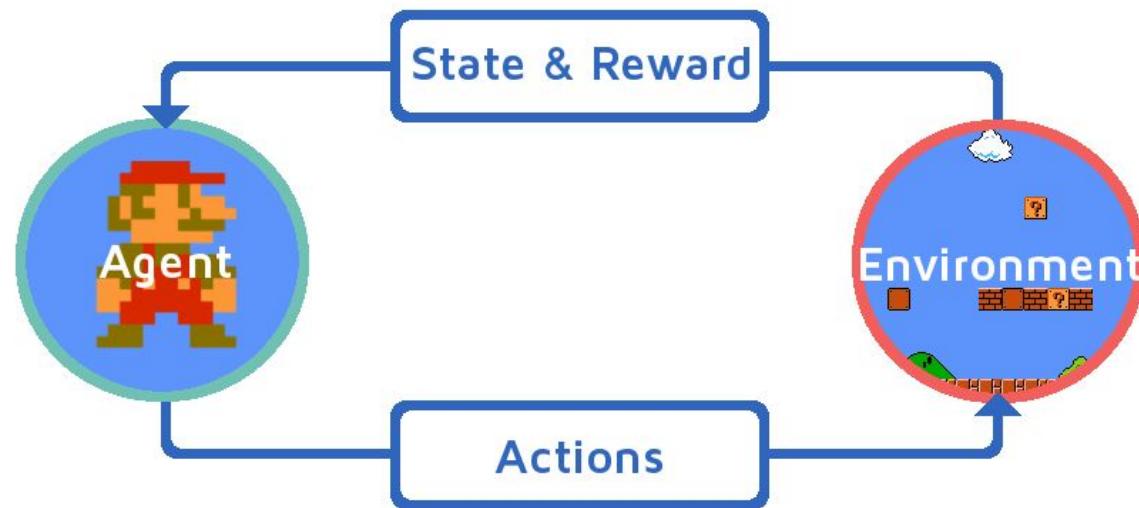
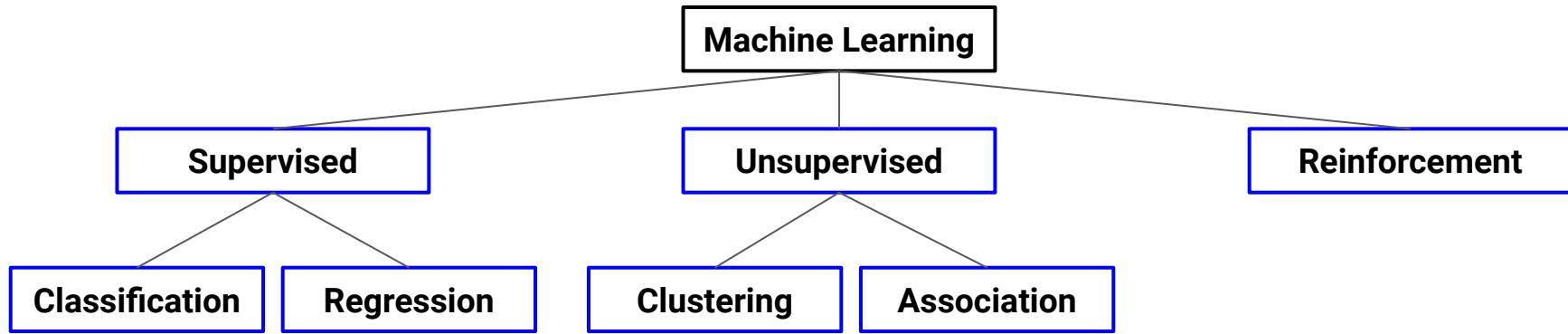
Clustering

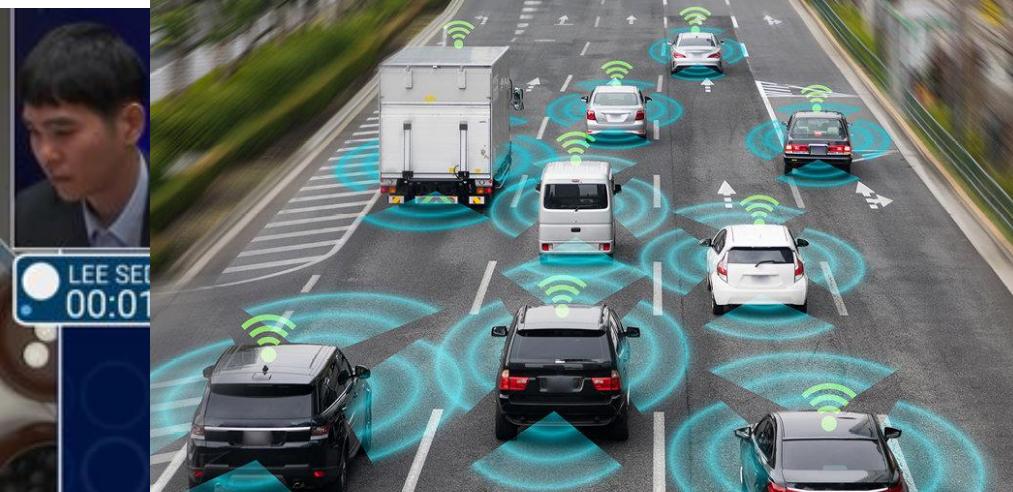


Association

Id commande	items
1	12,15,150
2	18,12,5
3	324,7,10
4	10,24,2,68
5	2
6	12,15,150
7	18,12,5
8	324,7,10
9	10,24,2,68

Reinforcement





Elon Musk's AI Beat The World's Best DOTA 2 Players

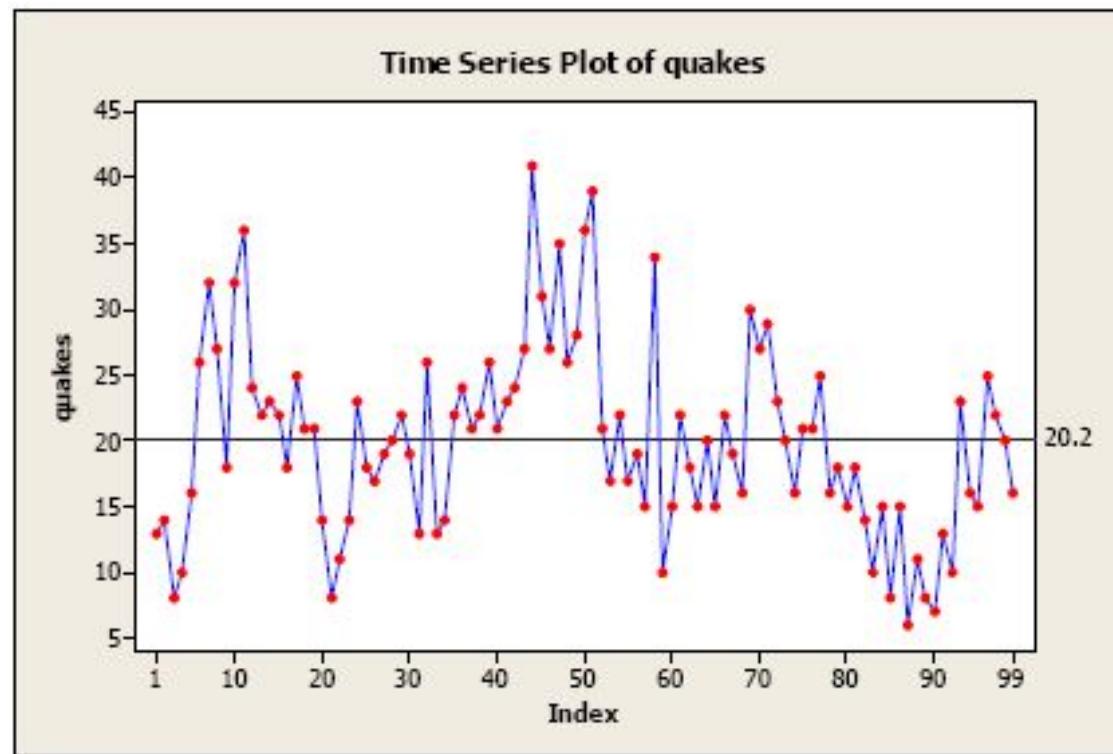




BREAK

Applications

Time Series



Recommender Systems



NETFLIX

facebook



Spotify®

Computer Vision (CV)



Object Detection



Image Segmentation

Classification



CAT

Classification + Localization

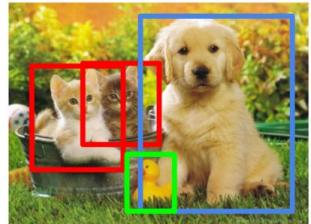


CAT

Computer Vision (CV)

Single object

Object Detection



CAT, DOG, DUCK

Instance Segmentation



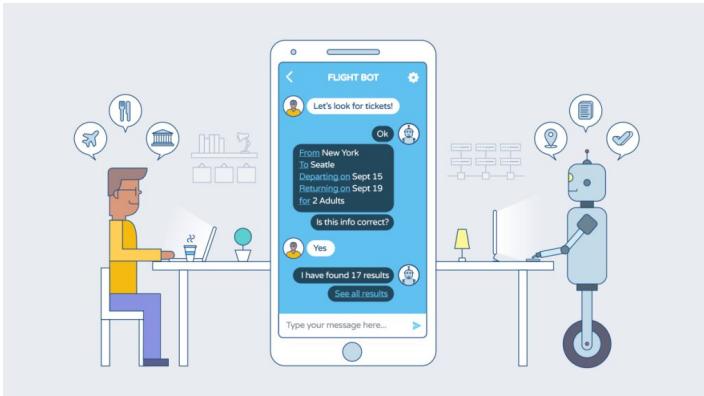
CAT, DOG, DUCK

Multiple objects

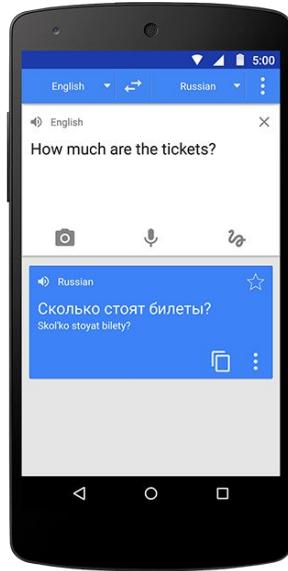


Emotional Analysis

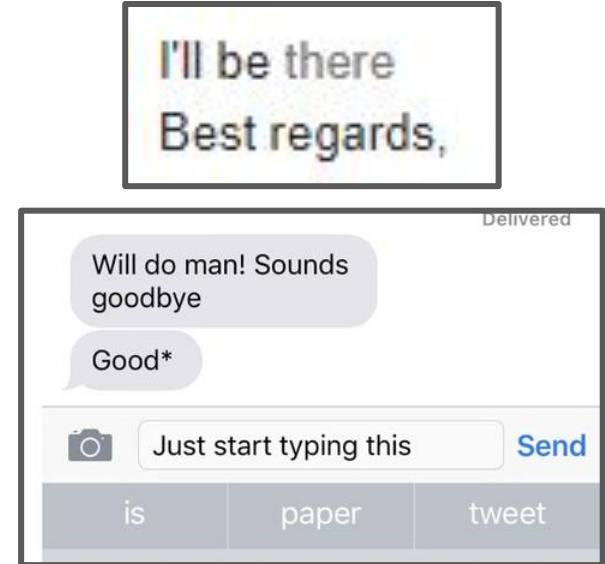
Natural Language Processing (NLP)



Chatbots



Text
Translation



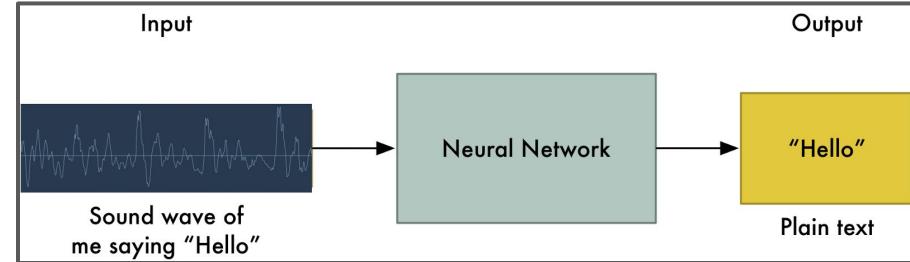
Language
Modeling

Natural Language Processing (NLP)

Speech Recognition



Sentiment Analysis



Movie Review	"It was incredibly unpredictable."	Positive
Internet Provider	"It was incredibly unpredictable."	Negative

Natural Language Processing (NLP)

SYSTEM PROMPT
(HUMAN-WRITTEN)

In a shocking finding, scientist discovered a herd of unicorns living in a remote, previously unexplored valley, in the Andes Mountains. Even more surprising to the researchers was the fact that the unicorns spoke perfect English.

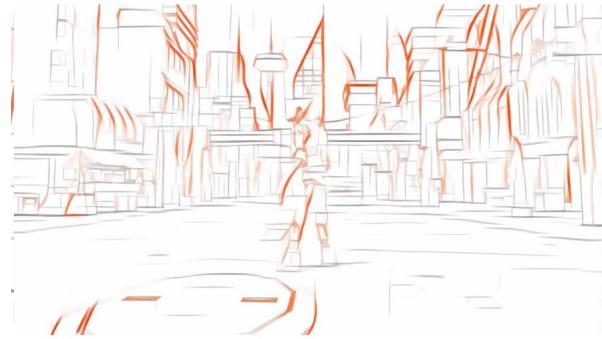
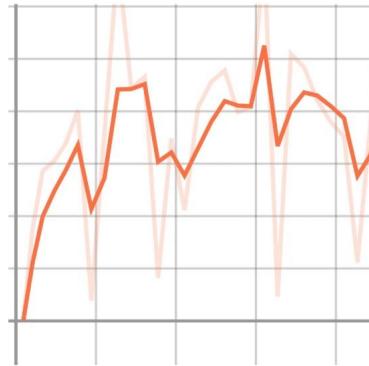
MODEL
COMPLETION
(MACHINE-
WRITTEN, 10 TRIES)

The scientist named the population, after their distinctive horn, Ovid's Unicorn. These four-horned, silver-white unicorns were previously unknown to science.

Now, after almost two centuries, the mystery of what sparked this odd phenomenon is finally solved.

Text Generation

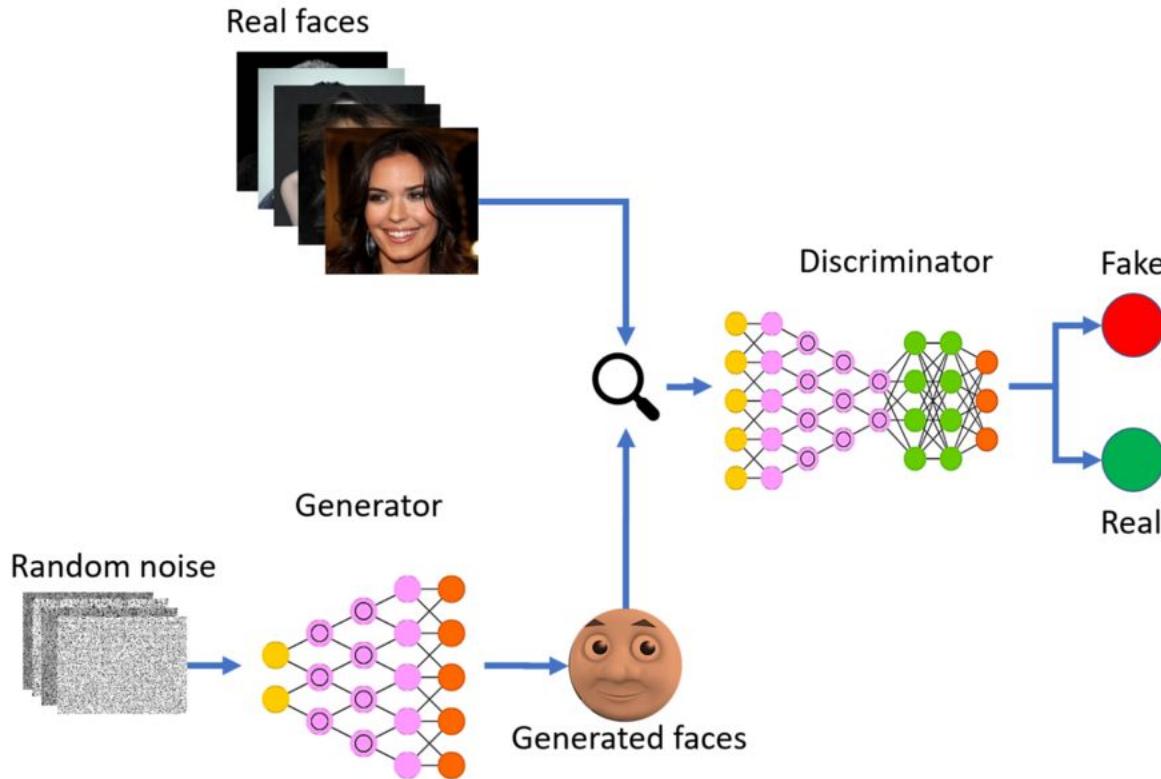
Transfer Learning



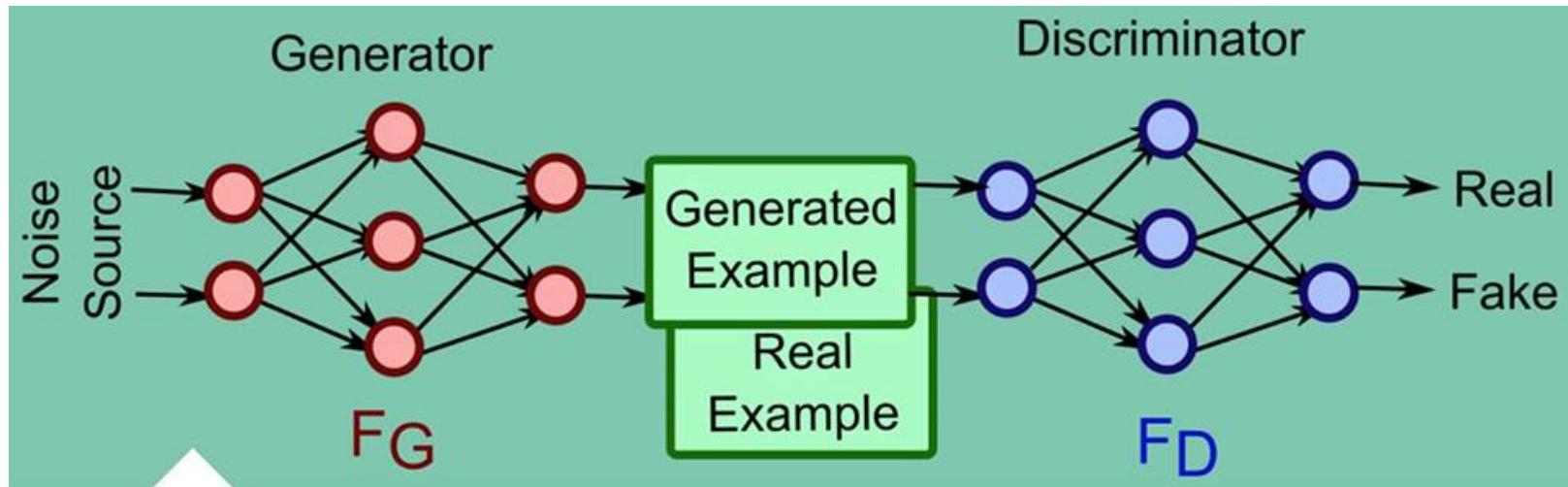
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Generative Adversarial Networks (GAN)



Generative Adversarial Networks (GAN)



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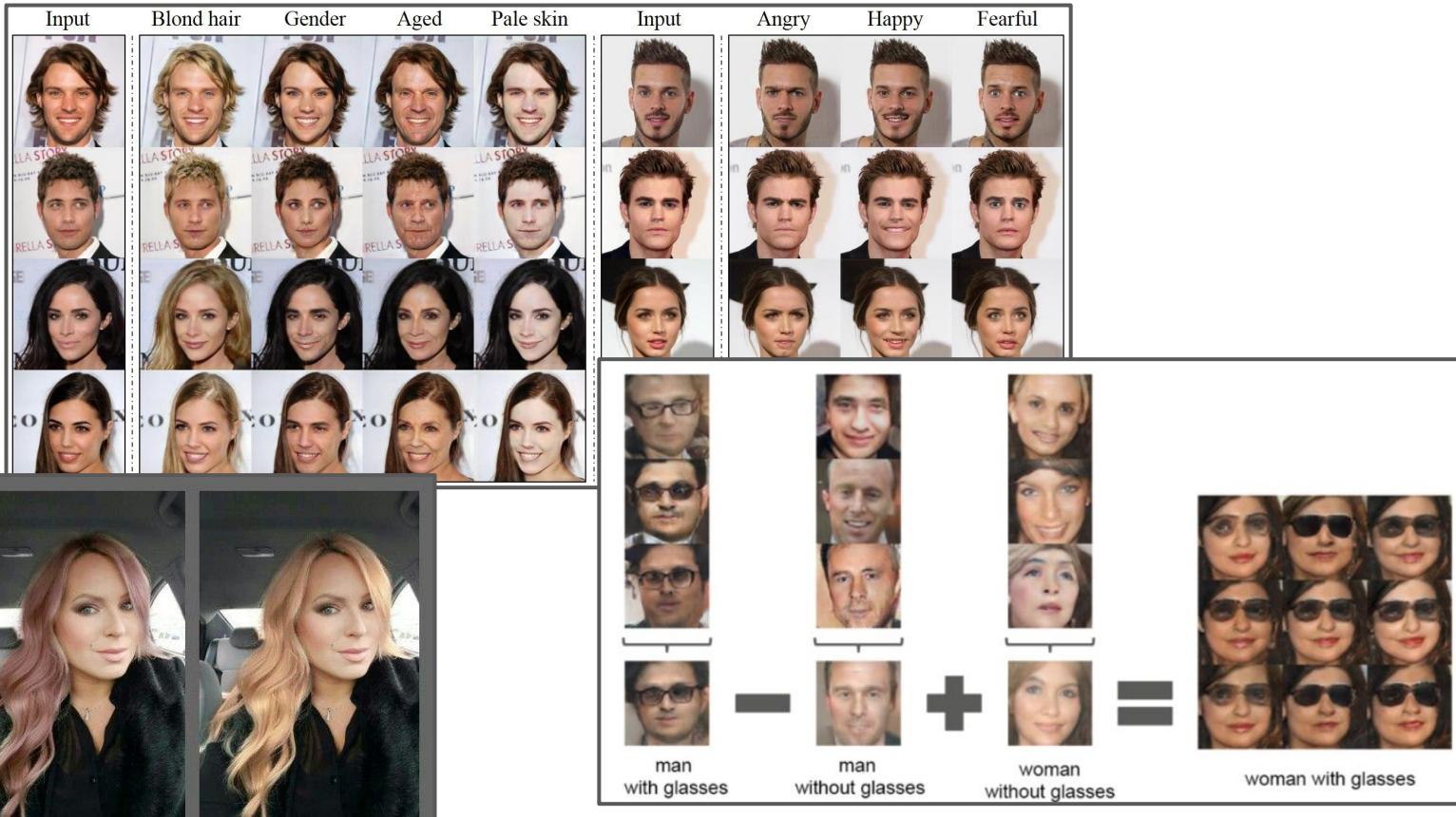
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Generative Adversarial Networks (GAN)



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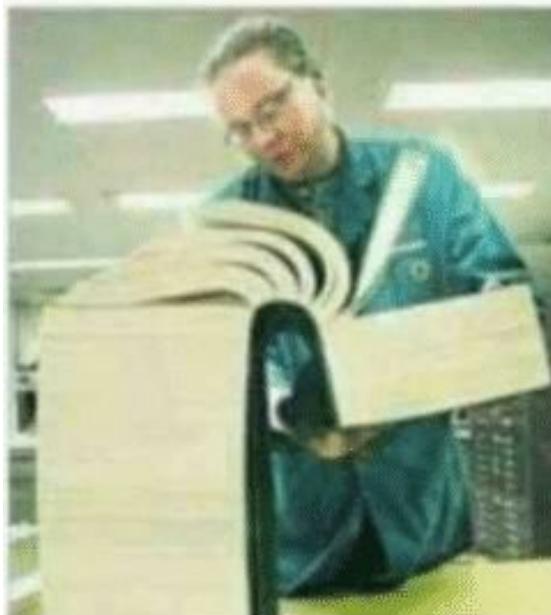


BREAK

Mnin nibda?

THE MATHS BEHIND DEEP LEARNING

import keras



Machine learning be like



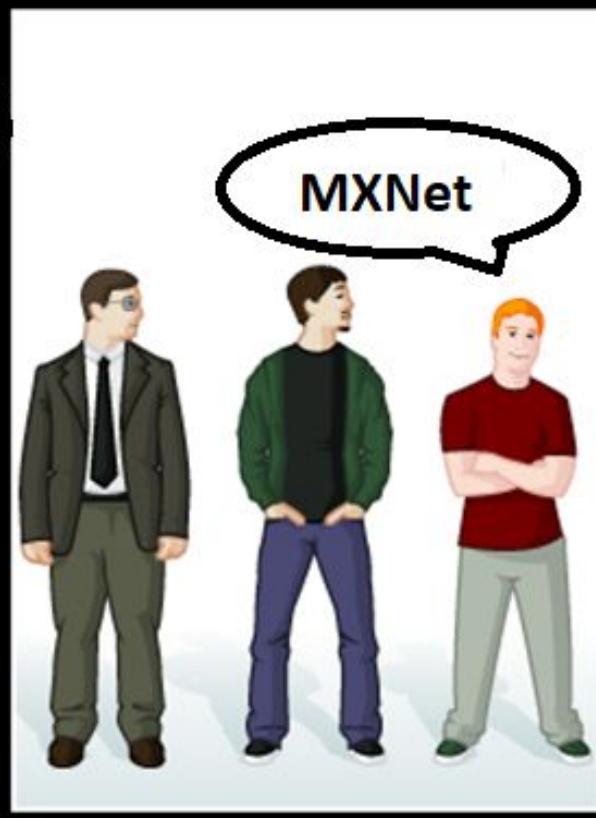
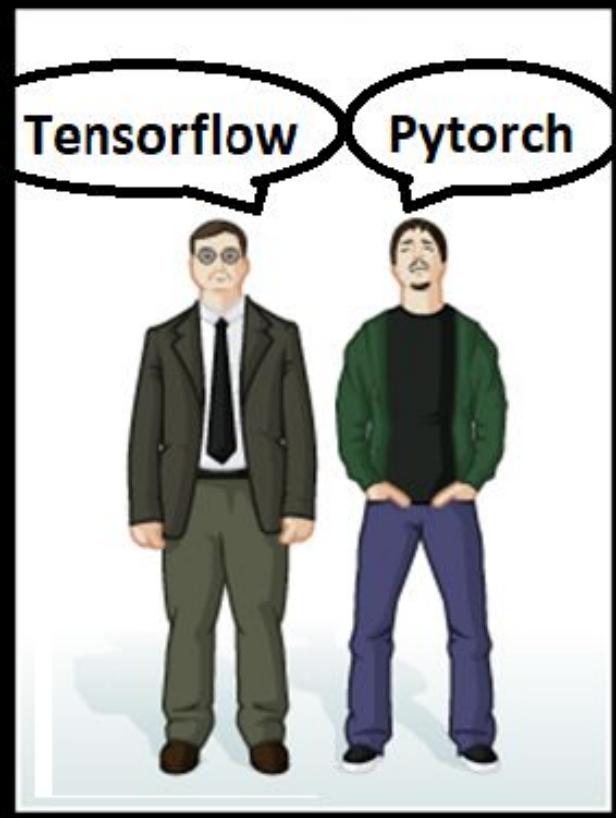
MXNet

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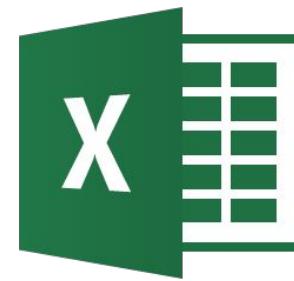
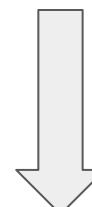
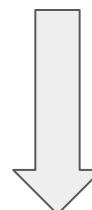
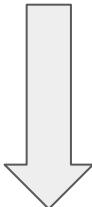
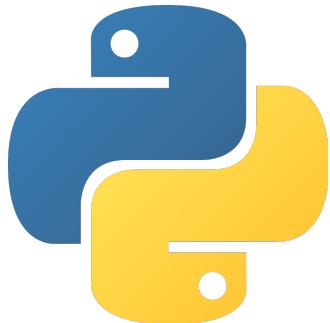
Chainer

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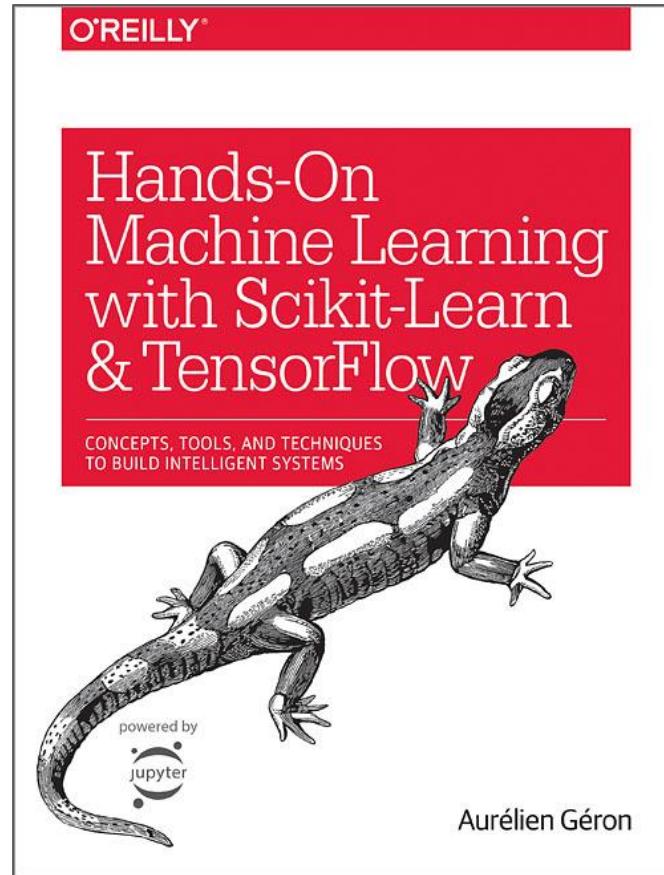
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