



ZAKA

Introduction to Artificial Intelligence

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www.zaka.ai

About Me



Christophe Zoghbi

- Software Engineer
- Computer Vision & Machine Learning consultant
- Founder & President of Beirut AI
- Co-founder & CEO of Zaka
- Visiting Lecturer at USEK

Email: christophe@zaka.ai

LinkedIn: [christophezoghbi](https://www.linkedin.com/in/christophezoghbi)

Twitter: [@kristoffzoghbi](https://twitter.com/kristoffzoghbi)

Facebook: [christophe.zoghbi](https://facebook.com/christophe.zoghbi)





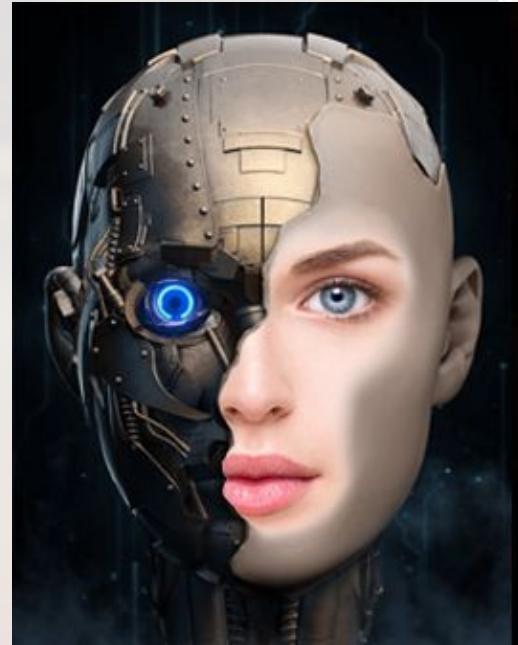
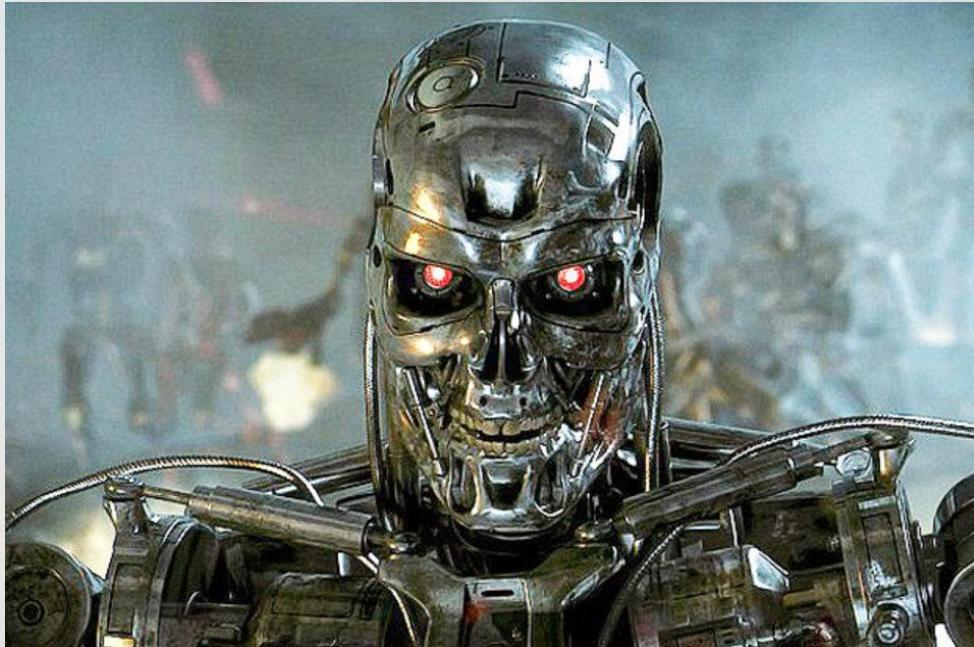
OUTLINE

- What is Artificial Intelligence?
- Different types of Machine Learning
- Applications of AI Today
- Problems with AI
- Q&A

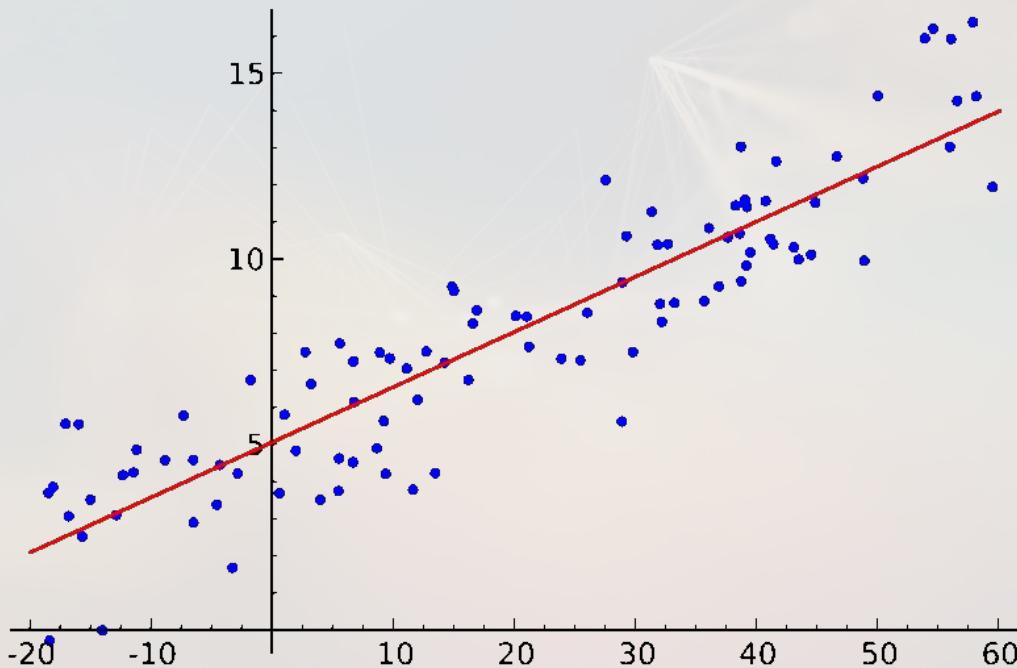
What is Artificial Intelligence?

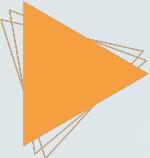


Is this AI?



Artificial Intelligence (AI)

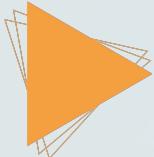




Artificial Intelligence (AI)

Building intelligent algorithms/agents which can:

- process large amounts of data
- recognize hidden patterns in the data
- perform human-like tasks (simulating human intelligence)
- learn from experience
- adjust to unseen data/input



Types of AI



Built for highly focused tasks



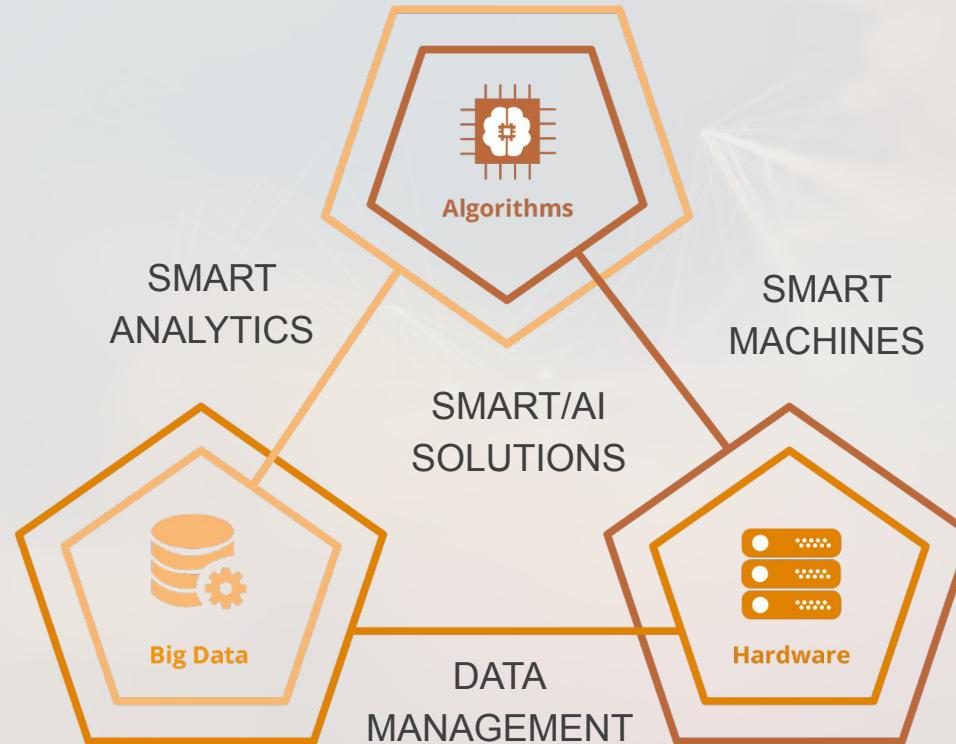
Built to improve the capabilities comparable humans

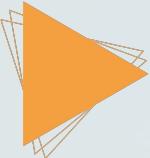


Built to exceeds human cognition by a great extent in every possible way



Main Components of AI





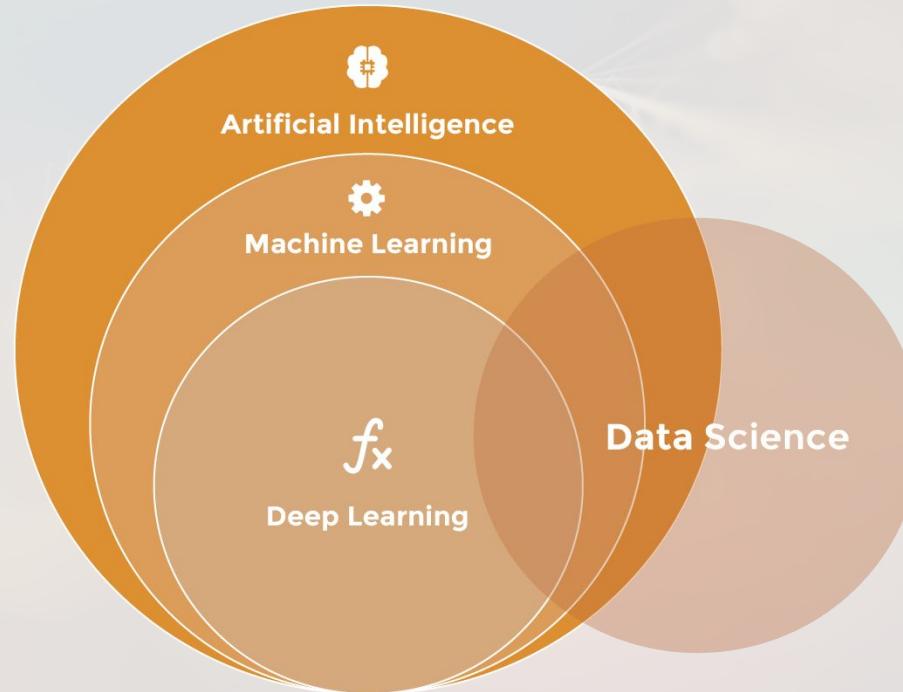
Why AI Today?

- Increase amount of data available (advancement in IoT and Big Data)
- Increase usage of social media
- Huge amounts of new articles, videos,... published every day

→ Need for an automated way to process all this data and produce meaningful insights!

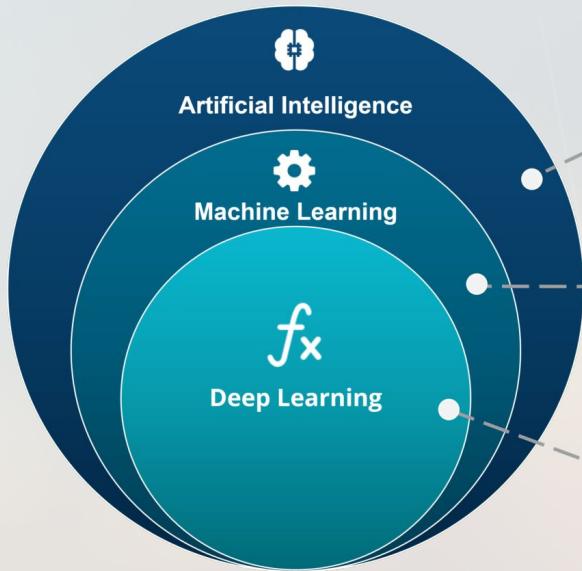


Where does AI fit?





Demystifying Terms



ARTIFICIAL INTELLIGENCE

A technique which enables machines to mimic human behaviour

MACHINE LEARNING

Subset of AI technique which use statistical methods to enable machines to improve with experience

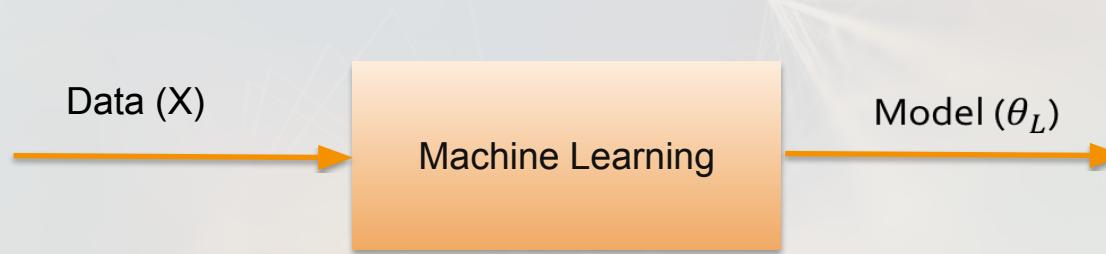
DEEP LEARNING

Subset of ML which make the computation of multi-layer neural network feasible



Machine Learning

- Machine learning aims at developing algorithms and models for machines to perform predictions or learn to perform human tasks.

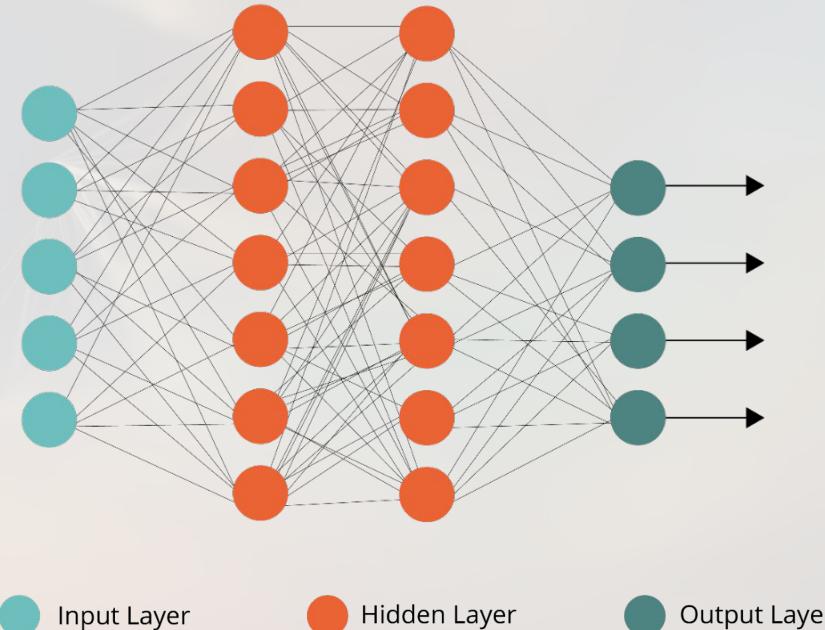


- Once the model is learned, it can be used for desired prediction of new unknown data.



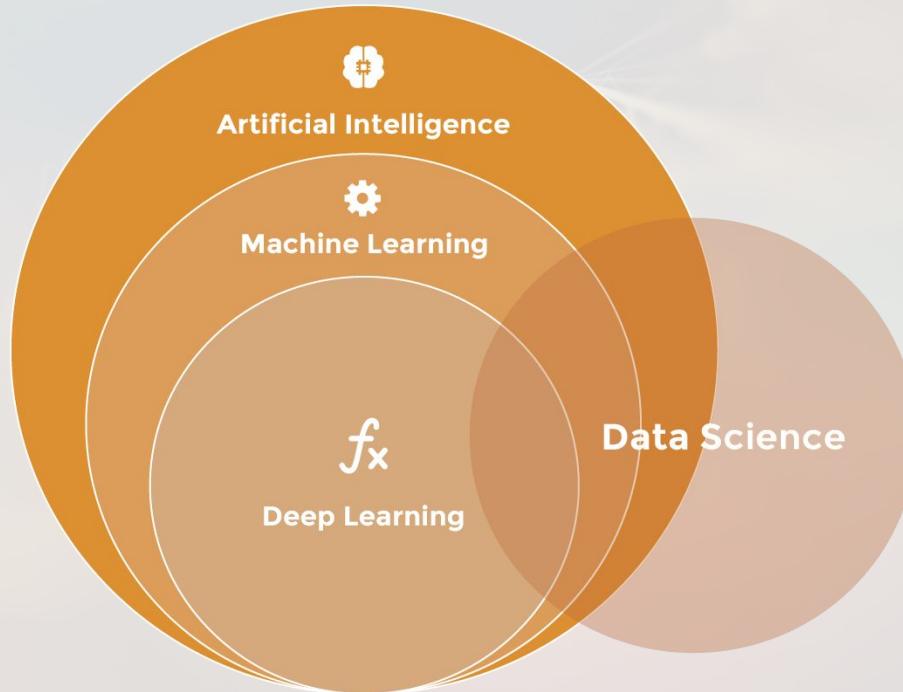
Deep Learning

- A group of Machine Learning algorithms directly inspired from human neural connections in the BRAIN.
- Our brain has lots of neurons connected together and **the strength of the connections** between neurons represents long term knowledge.



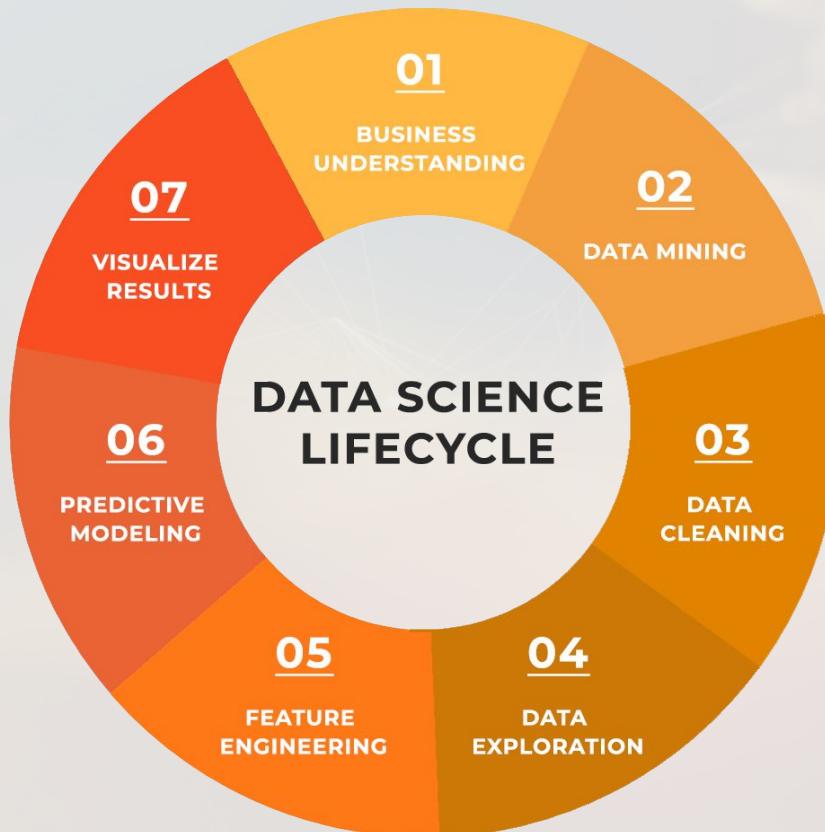


Notice the intersection





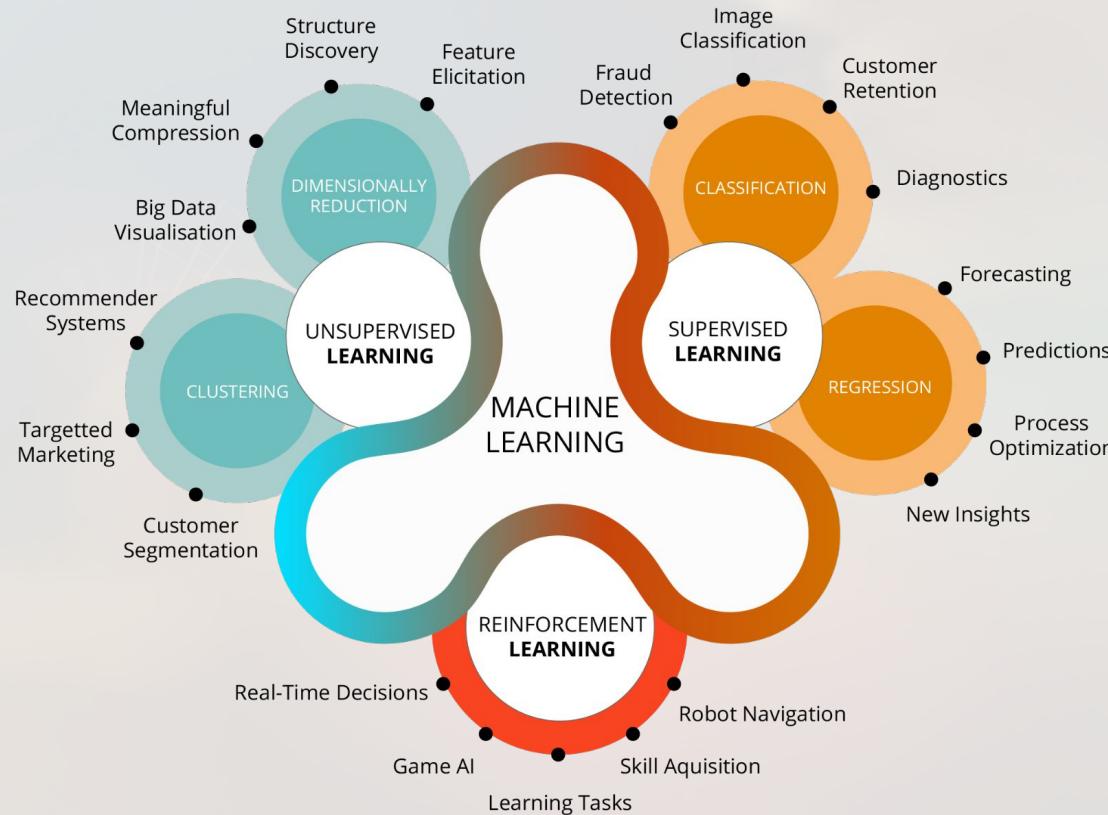
Data Science Lifecycle



Machine Learning



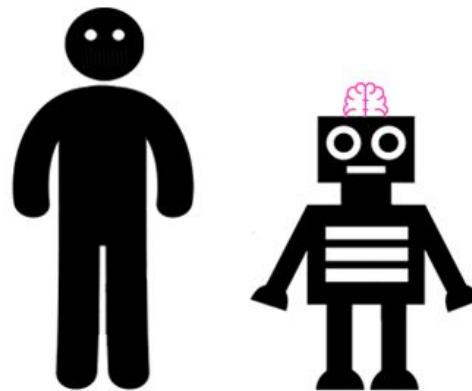
Types of Machine Learning





Supervised Machine Learning

- Output labels are known
- Learn the ML model that produces the prediction closest to the output





Supervised Learning

Classification

Categorical

Discrete Values

Predicting a class

Example: Predict
Spam/No-spam Email

Regression

Numerical

Continuous Values

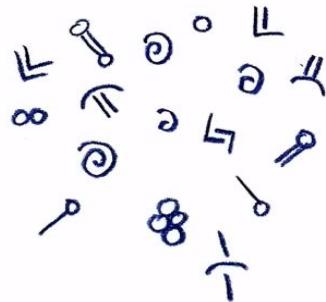
Predicting a
quantity/intensity

Example: Predicting GPA
of students



Unsupervised Machine Learning

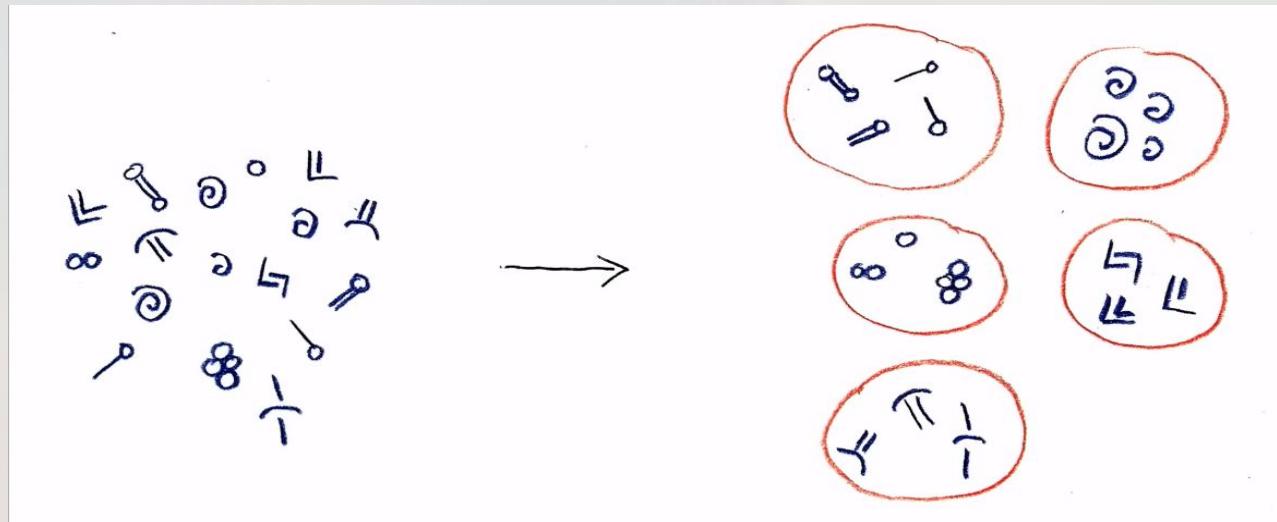
- Output labels are not known
- Divides data into clusters based on measured similarity, e.g. *Closest distance*

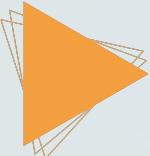




Unsupervised Machine Learning

- Output labels are not known
- Divides data into clusters based on measured similarity, e.g. *Closest distance*





Reinforcement Learning

- An agent interacts with an environment and performs action
- Learns through experience (reward mechanism)

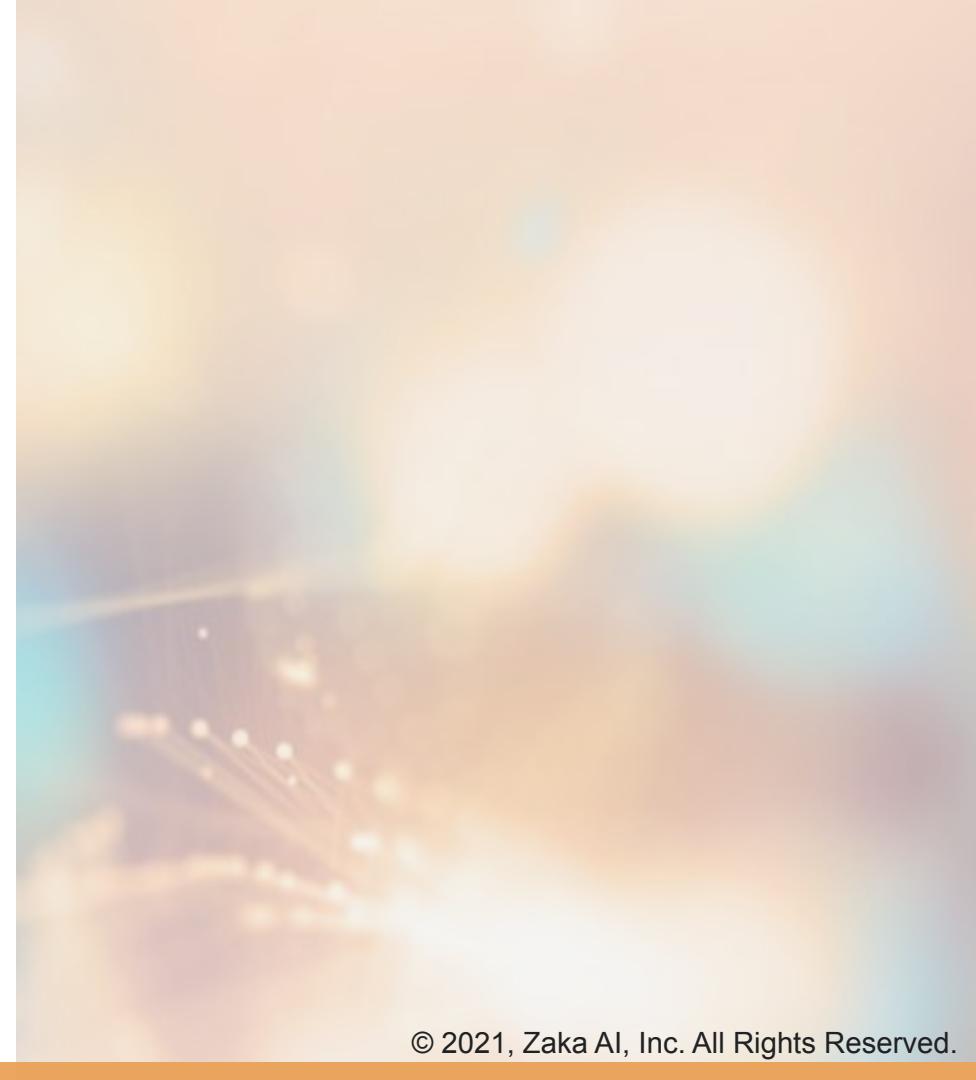




Reinforcement Learning



Applications of AI Today



Self-driving Cars

Company: Waymo

Technologies: Computer vision,
Deep Learning, Lidar

Description: Waymo's cars are
built for full autonomy with sensors
that give 360 degree views and
lasers that detect objects up to 300
meters away!



Virtual Assistant

Company: Amazon Alexa

Technologies: Natural Language

Processing/Understanding, Voice recognition,
Audio transcribing, Text-To-Speech

Description: Amazon Alexa has heralded a new dawn in voice recognition software, using extremely complex machine learning processes to revolutionize the way we conduct everyday tasks.

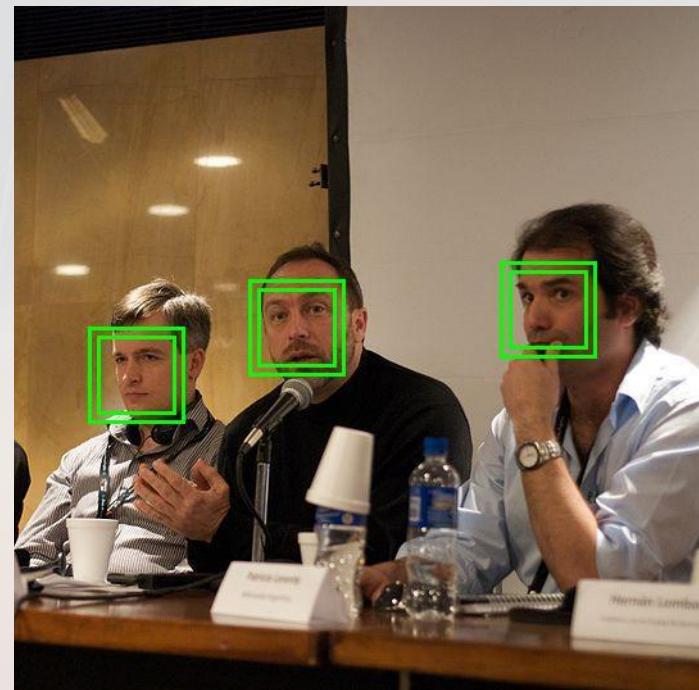


Person Identification

Company: Facebook

Technologies: Computer Vision, face detection, face recognition, Deep Learning

Description: Facebook can automatically find and identify friends in uploaded photos due to its highly efficient facial recognition systems.





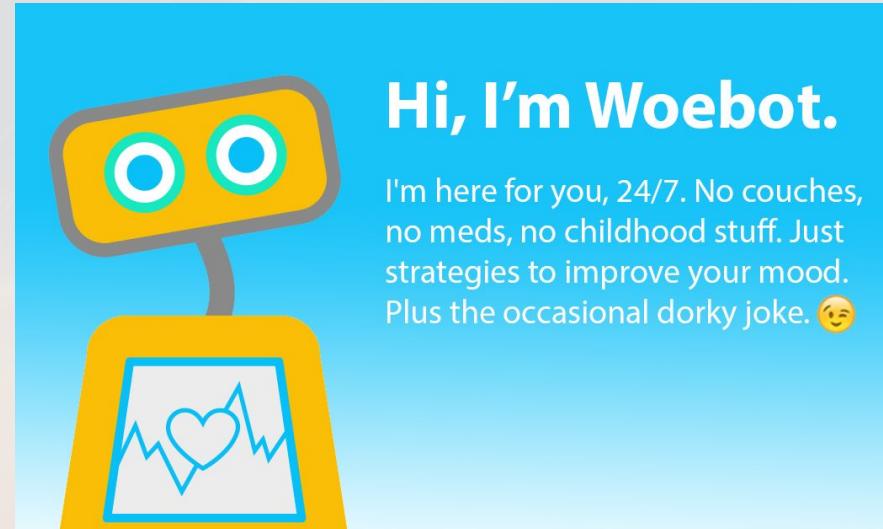
Mental Health Assistants - Chatbots

Company: Woebot

Technologies: Natural Language

Processing, Deep Learning, Chatbots

Description: Woebot monitors daily, one-on-one interactions with users using natural language processing (NLP) to deliver a self-guided version of cognitive behavioral therapy (CBT), which is the most effective treatment for mental health problems.



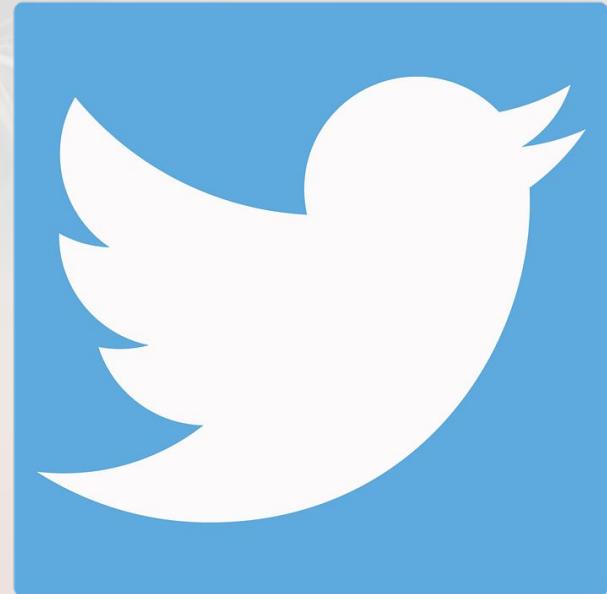


Ranking Tweets

Company: Twitter

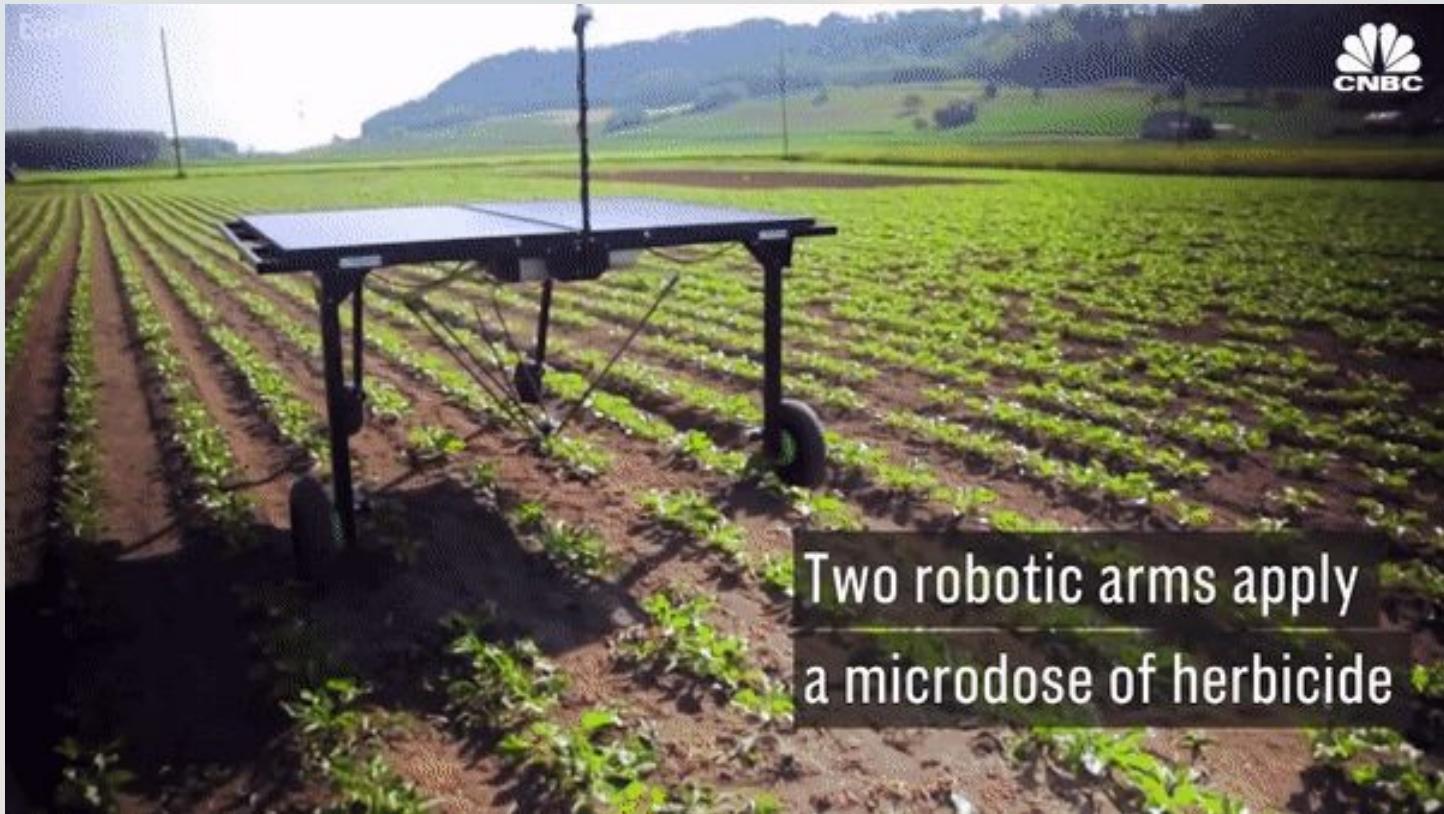
Technologies: Deep Learning, ranking algorithms, Natural Language Processing

Description: Twitter gathers all your timeline's tweets and each is scored by a relevance model. The model's score predicts how interesting and engaging a tweet would be specifically to you. A set of highest-scoring Tweets is then shown at the top of your timeline, with the remainder shown directly below.





Automated Agriculture



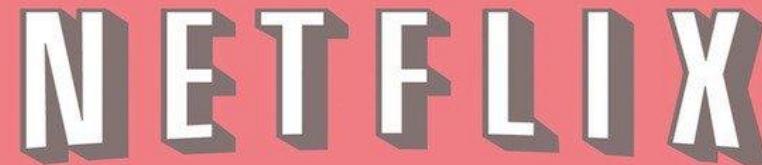
Two robotic arms apply
a microdose of herbicide



Recommendation engines



**35% OF AMAZON'S REVENUE ARE GENERATED
BY IT'S RECOMMENDATION ENGINE.**



**75% OF USERS SELECT MOVIES BASED ON
NETFLIX'S RECOMMENDATIONS.**



Translation



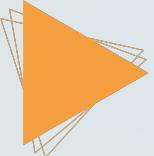


Sentiment Analysis



Deep Fakes





Which Ones Are Real?!

Post your votes!



<https://thispersondoesnotexist.com/>



DeepFake News



<https://www.youtube.com/watch?v=emeIRYffz6c&feature=youtu.be>



DeepFake



Problems & challenges of AI





Problems & Challenges

- Fake news and Deep Fake disinformation
- AI black box / transparency
- Algorithm bias
- Adversarial attacks
- Data privacy & security
- Data scarcity
- Ethical challenges



“AI is likely the best or the
worst thing to happen to
humanity” - **Stephen
Hawking**



Let's Stay Connected

Email: christophe@zaka.ai

LinkedIn: [christophezoghbi](https://www.linkedin.com/in/christophezoghbi)

Twitter: [@kristoffzoghbi](https://twitter.com/kristoffzoghbi)

Facebook: [christophe.zoghbi](https://facebook.com/christophe.zoghbi)



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Q&A