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Introduction To Machine Learning

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01 Definition of ML

02 Types of ML

03 The workflow of resolving a ML problem

04 What is Deep Learning?

05 Real world applications of ML

06 Conclusion

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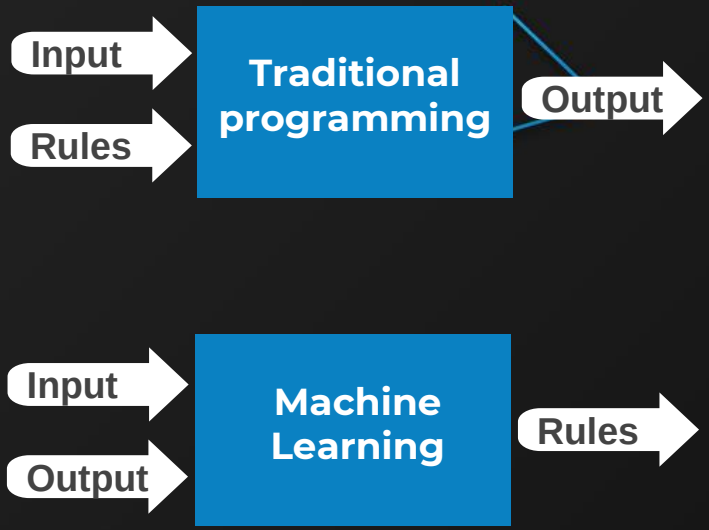
What is Machine learning?

Machine Learning is the subfield of computer science that gives the computer the ability to learn without being explicitly programmed.



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Types of machine learning

Supervised Learning

Unsupervised Learning

Reinforcement Learning

SUPERVISED LEARNING

Data :
Input (x) – Output (y)
Pairs

Goal :
Learn a function to map our input to the output

$$f(input) \approx output$$

Examples of spam and non spam e-mails

Model

Train the model

Example :
Classifying spamming e-mails

Spam?

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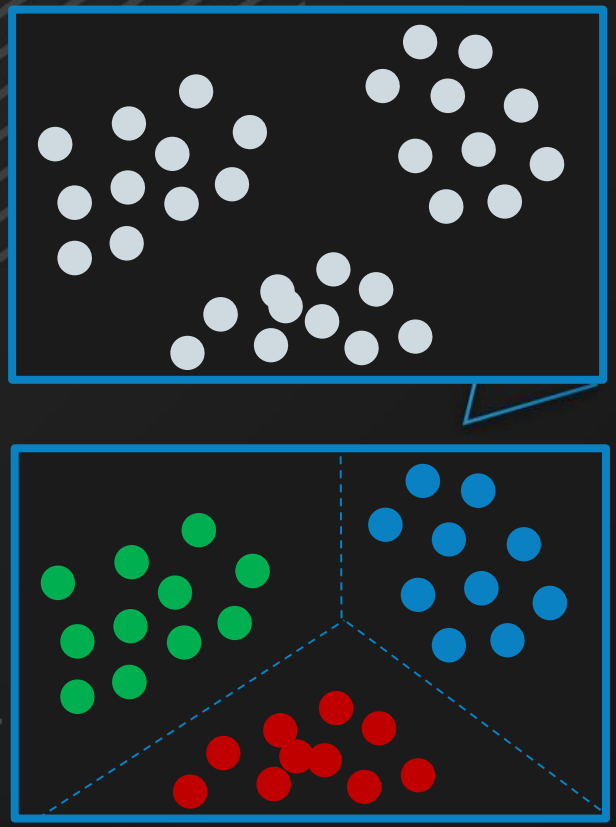
UNSUPERVISED LEARNING

Data :
Just data (x), no labels

Goal :
Learn some underlying structure and pattern in the data

Example :
Clustering



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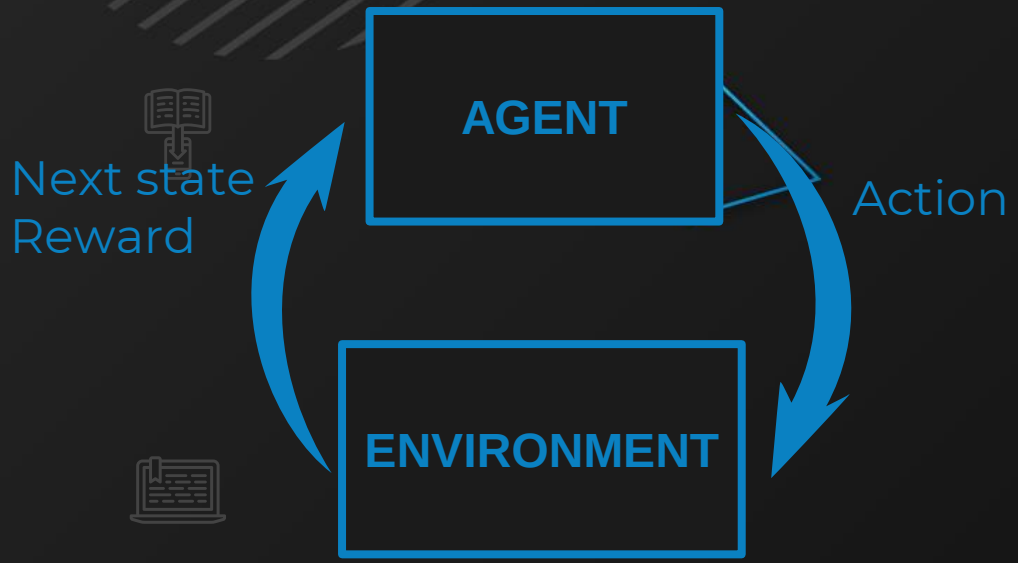
REINFORCEMENT LEARNING

Involves an **agent** interacting with an **environment** which provides a **reward**

- Goal :
  Learn how to take actions to maximize future reward



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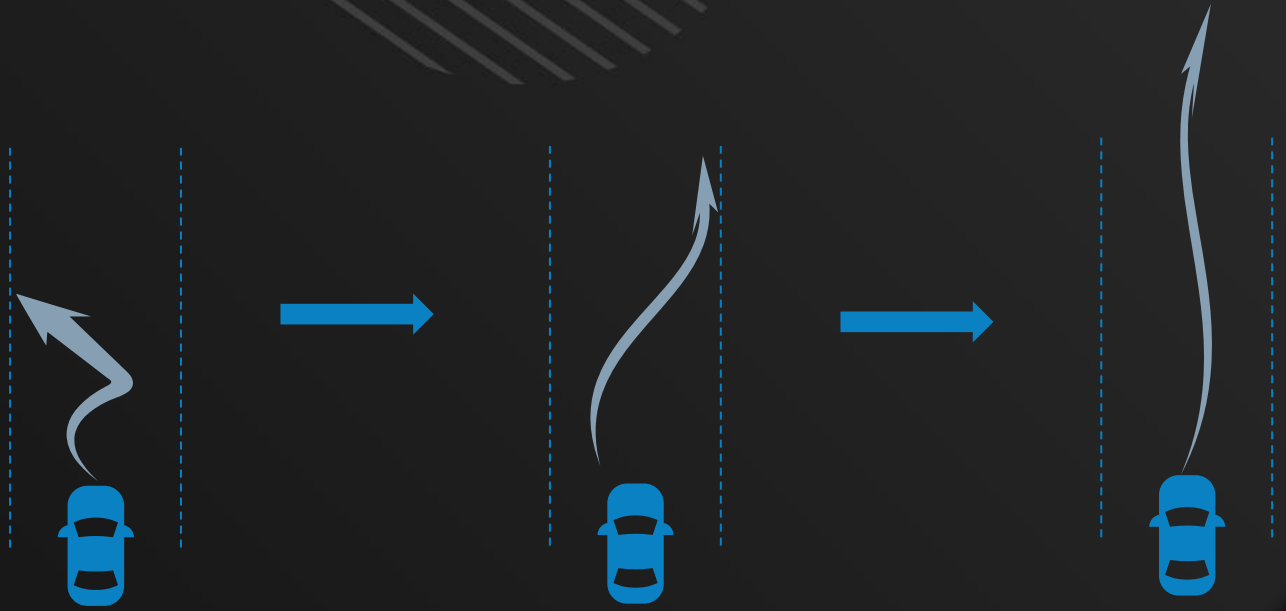
Example of a self driving car



https://selfdrivingcars.mit.edu/deeptraffic/

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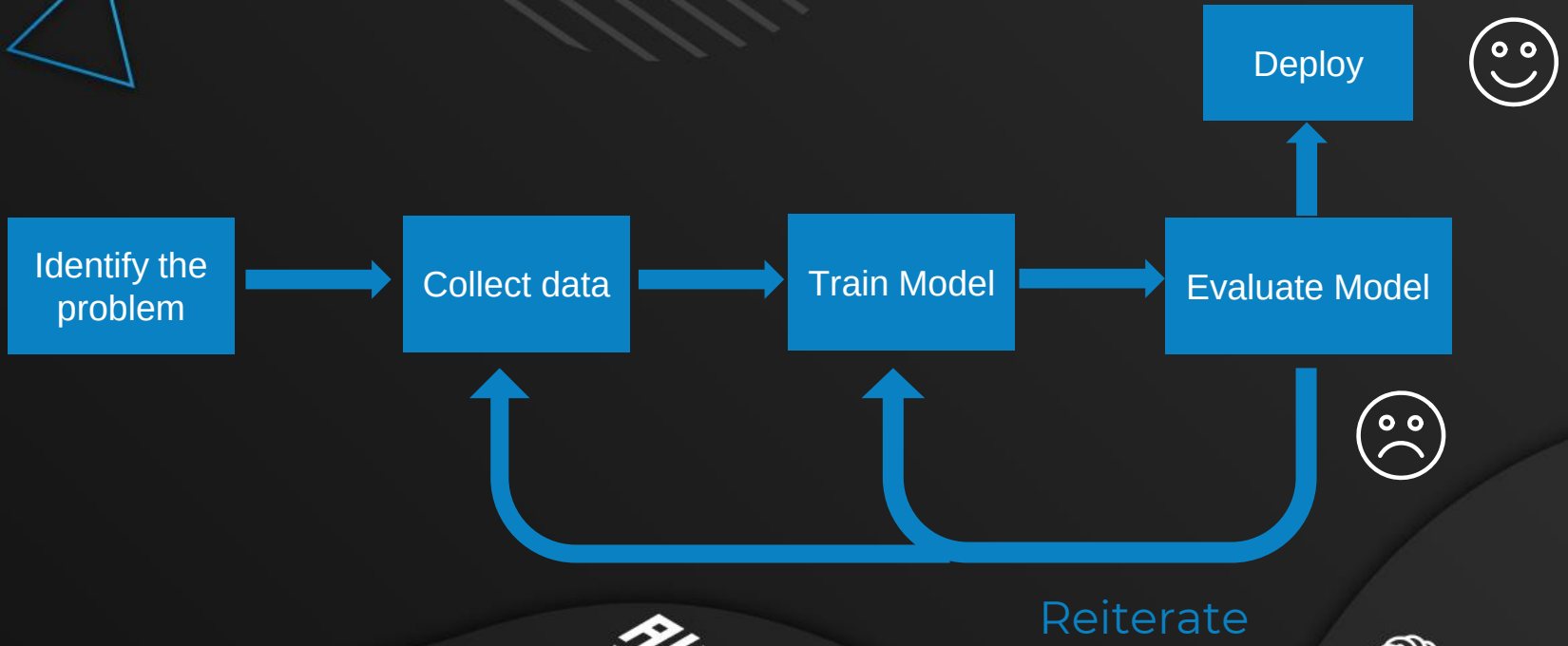
Workflow of solving a machine learning problem



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ARTIFICIAL INTELLIGENCE

Any technique that enables computers to mimic human behavior.

MACHINE LEARNING

Ability to learn without being explicitly programmed

DEEP LEARNING

Extract patterns from Data using neural networks

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1943 Mathematic model of NNs

1975 Backpropagation

1982 Recurrent NNs

1994 Convolutional NNs

Neural networks back decades, why until now?

Big Data

- Large datasets
- Easy collection and storage

Hardware

- CPUs and GPUs
- Computation power and parallelism

Software

- New Models
- Toolboxes (ML frameworks)

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Real world applications of ML

What are some cool applications of Machine Learning you know?

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Which one of these is fake?

A

B

C

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Self-Driving cars

https://www.youtube.com/watch?v=tlThdr3O5Qo

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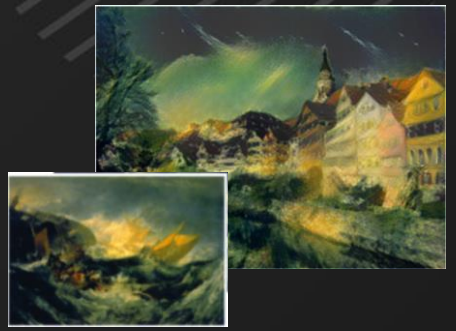
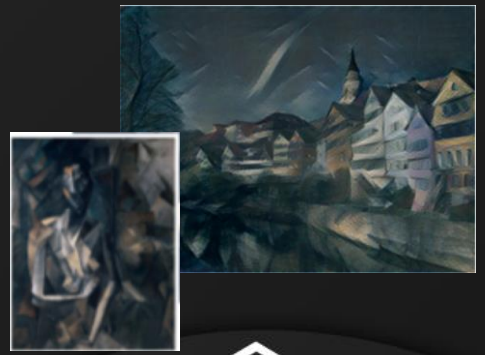
Style transfer





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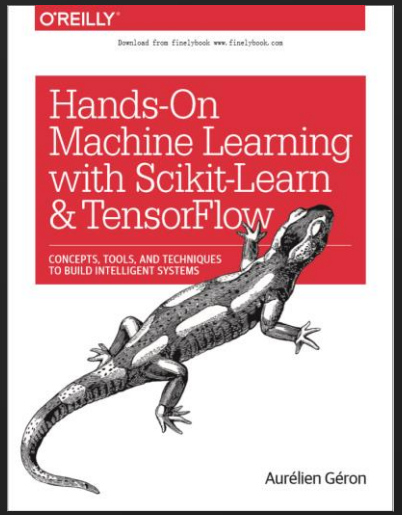
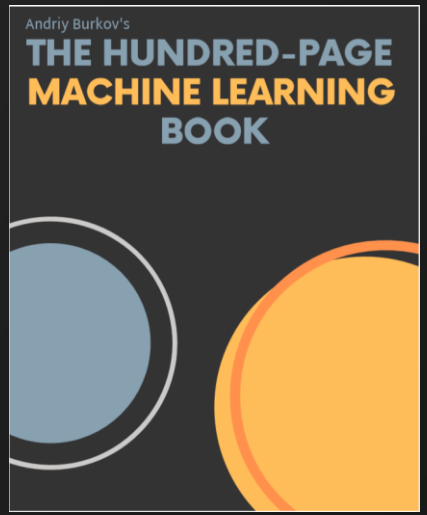
You love learning from books?





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Thank You!

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