

Workshop

Maskinlæring



COGITO

Innhold

Mål: Få grunnleggende forståelse for trening og bruk av maskinlæringsmodeller

Del 1: Sentrale konsepter

Del 2: Kaggle-konkurranse!

- Bruk det dere har lært til å konkurrere mot hverandre

kaggle



“Machine learning gives computers the ability to learn without being explicitly programmed”

- Arthur Samuel (1959)



Create systems to play at super human level

Former world champion of Go defeated by
AlphaGo in 2016



Generate images



MARKETING AI
Open Source Marketing Tool



Generate AI Images for Marketing...



Step by Step:



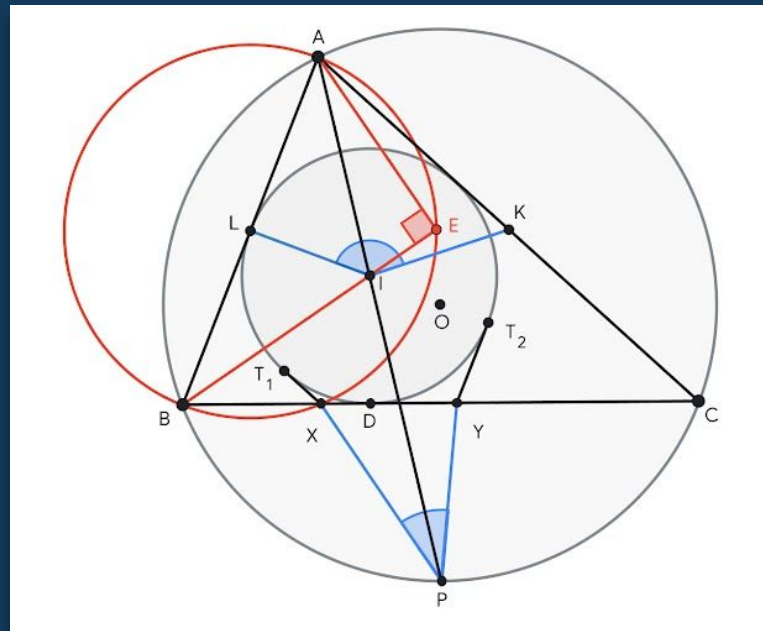
1. Prompt



2. Enjoy

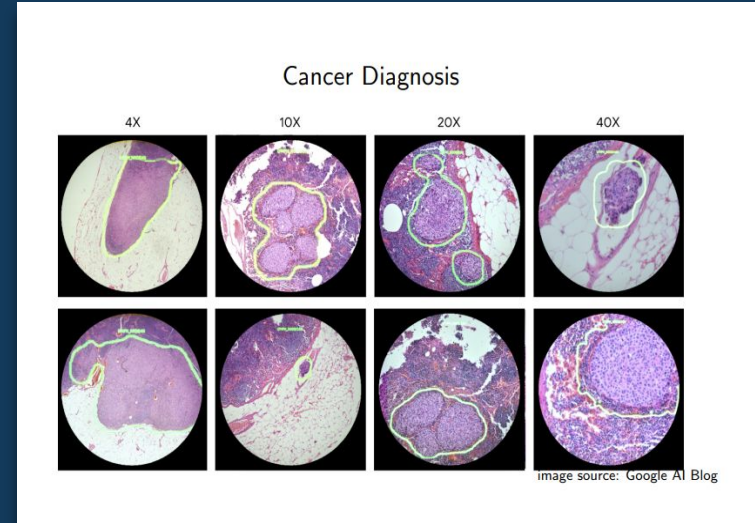
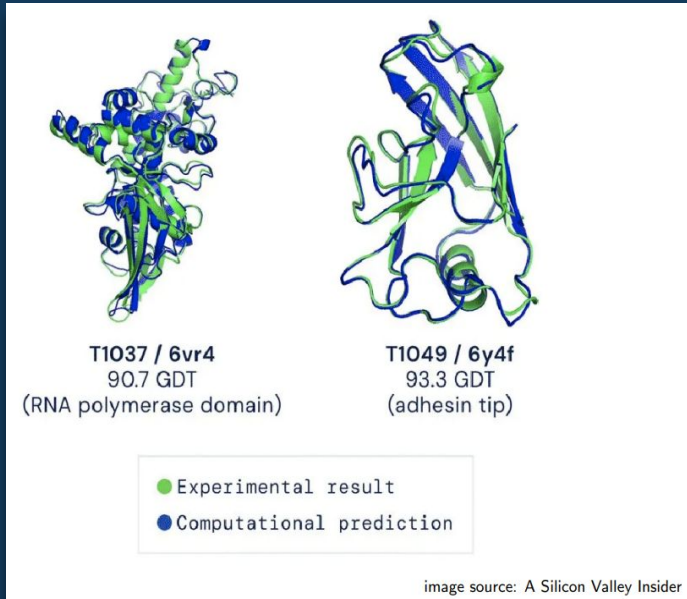
Create systems to solve some of the hardest math problems

Score on IMO 2024 problems



Save lives

Predicting protein structure

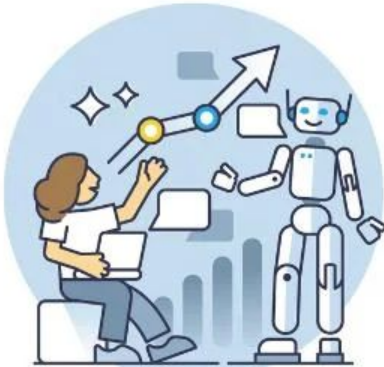
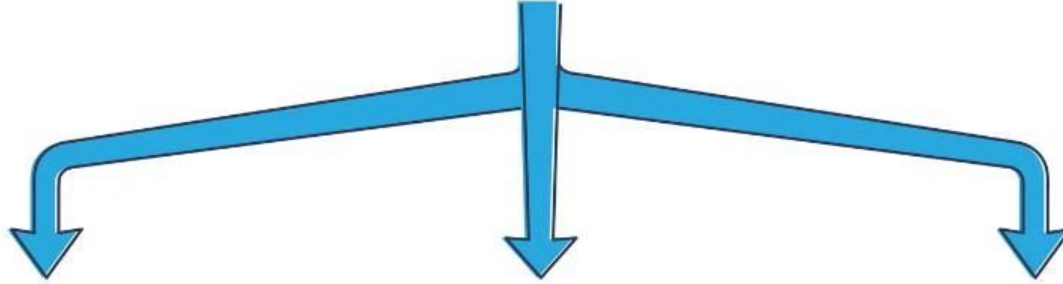


Job Trends for a Machine Learning Engineer from 2010 to 2020



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MACHINE LEARNING



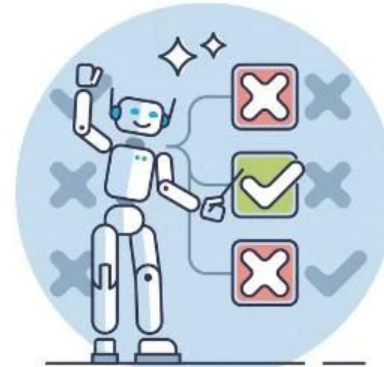
SUPERVISED

**TASK DRIVEN
(PREDICT NEXT VALUE)**



UNSUPERVISED

**DATA DRIVEN
(IDENTIFY CLUSTERS)**



REINFORCEMENT

**LEARN
FROM MISTAKES**

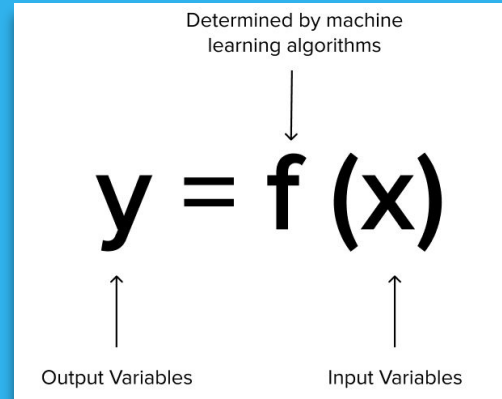
Supervised Learning

X1	X2	X3	Xn	Y

Target

In supervised learning we have
The data X consisting of different
features and the label y what we want
to predict

Machine learning models tries to learn
the function to transform X into y

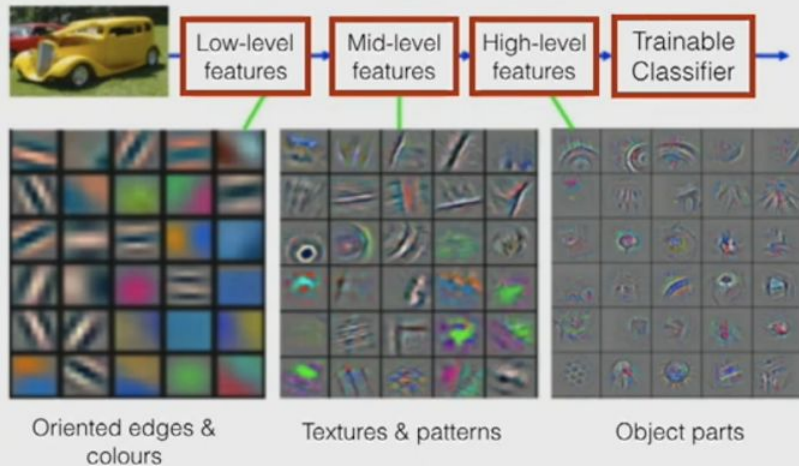


Two Paradigms of Machine Learning

Deep Neural Networks

『hierarchical *representation* of data』

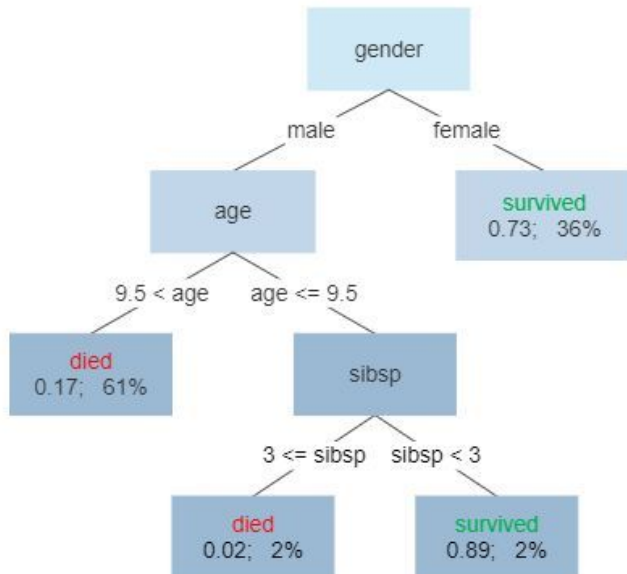
ImageNet classifiers with CNNs
[Zeiler and Fergus, ECCV 2014]



Decision Trees

『hierarchical *clustering* of data』

Survival of passengers on the Titanic

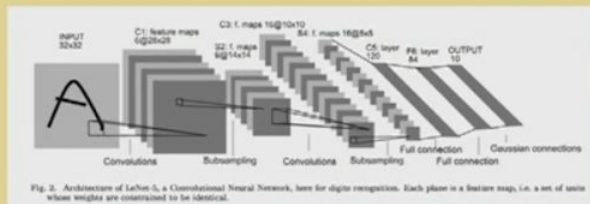


Two Paradigms of Machine Learning

Deep Neural Networks

『hierarchical *representation* of data』

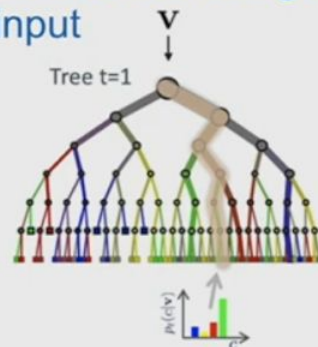
- + learn features of data
- + scalable learning with stochastic optimisation
- architectures are hand-designed
- heavy-weight inference, engaging every parameter of the model for each input

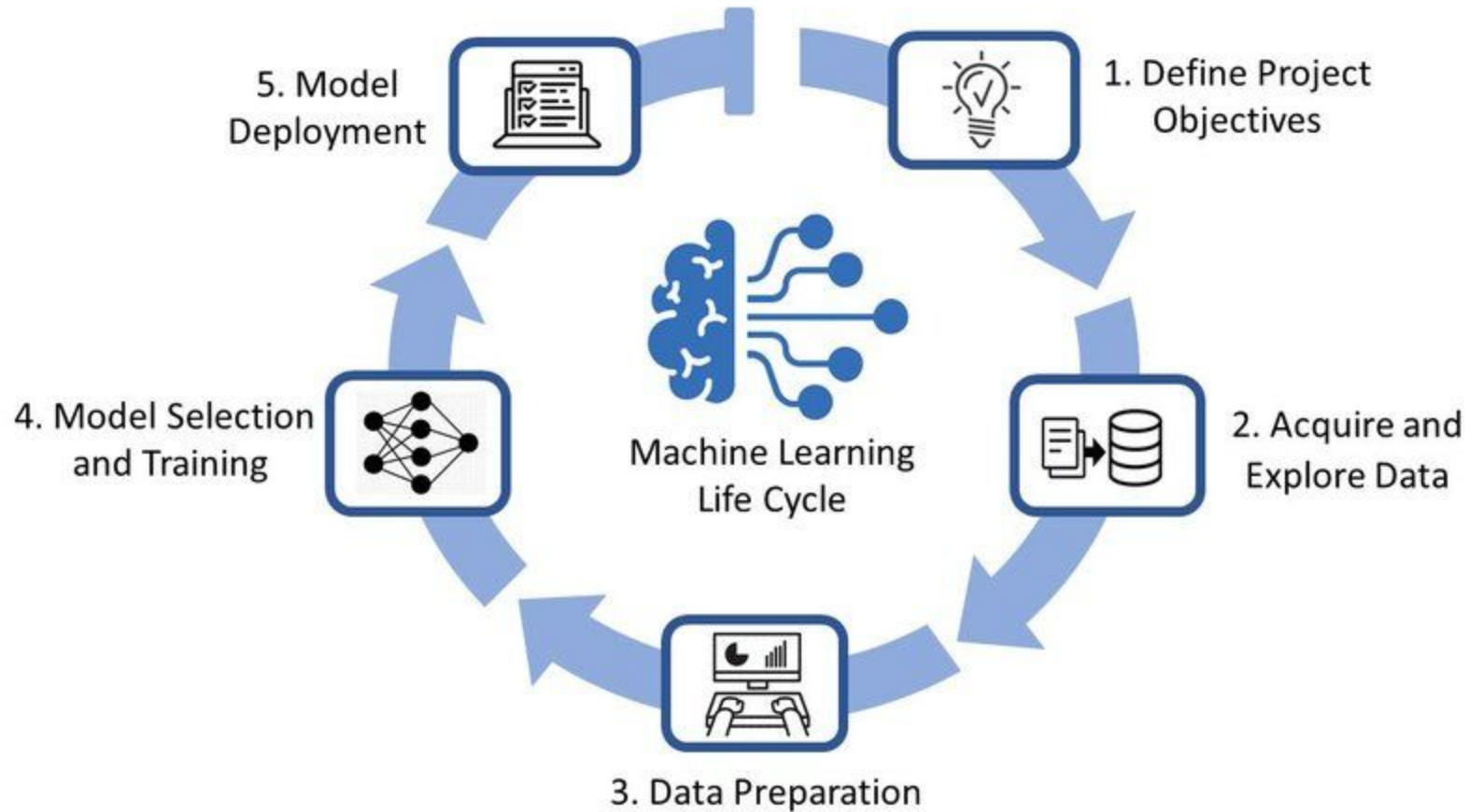


Decision Trees

『hierarchical *clustering* of data』

- operate on hand-designed features
- limited expressivity with simple splitting functions
- + architectures are learned from data
- + lightweight inference, activating only a fraction of the model per input





TASK 1 - Define the problem (5 min)

TASK 2.1-2.4 - Explore the data (20 min)



Preprocessing

Feature engineering

Training, Validation, and Test split



TASK 3 - Train and tune your first Machine learning Model (15 min)

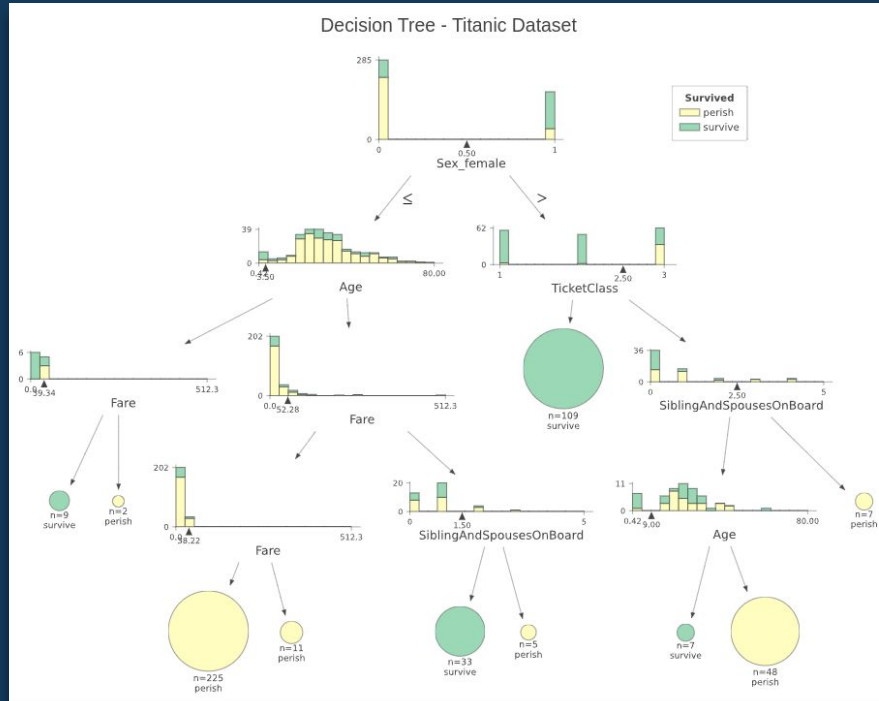


Understand the model

- Model can gain knowledge we humans do not possess
- The model might not have learned what we think it has



TASK 4 - Interpret a decision tree model (10 min)



- Create a hypothetical person, give them an Age, TicketClass, Sex, Fare and where they embarked from
- Go down the decision tree and see whether the model thinks they would survive or not

TASK 5 - Competition (final part of the workshop)

- Designate a team lead for each table and send them to the stage.
- The rest of the table try different machine learning algorithms, do some feature engineering and look at the tips for the competition at the bottom.

kaggle

