TPPE74
Design and Development of Manufacturing Operations

Industrial Engineering and Management of European Higher Education

Seminar 6

AI and machine learning

2021

Co-funded by the Erasmus+ Programme of the European Union

Seminar: AI and machine learning

Recap (Lecture)

TOP Trending Technologies

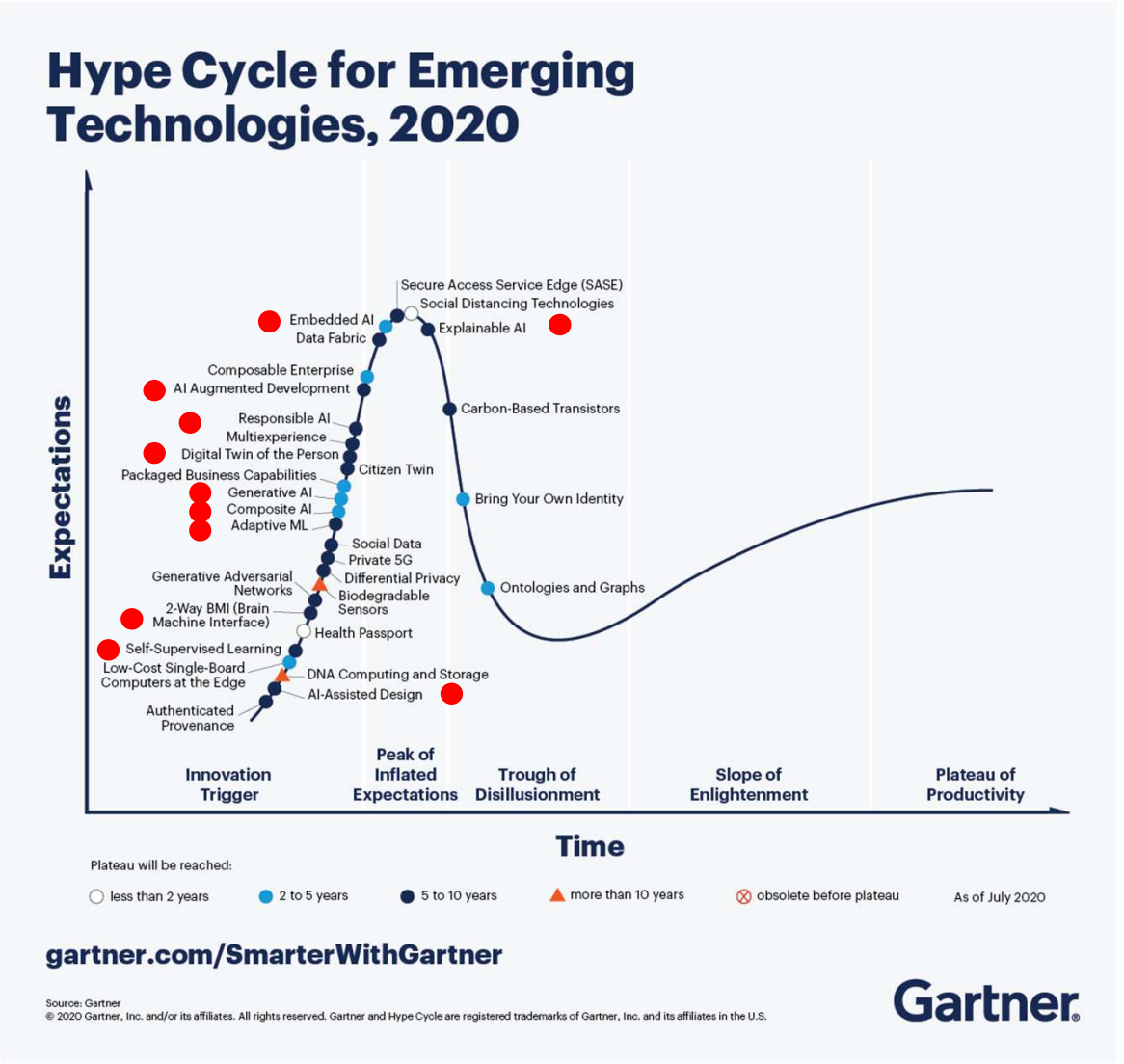
AI has been and continues to be one of the most promising areas for technology development

Within 2 – 10 years

These technologies will actually be utilized by the time todays students graduate

AI > 34 %

Over 34 % of all emerging technologies is within AI and machine learning so a general understanding will be of importance for almost working within tomorrows business enviroment



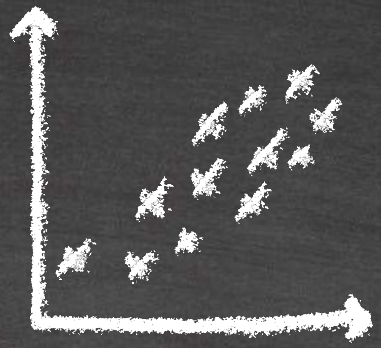
SUMMARY

Machine learning is an increasingly important area.

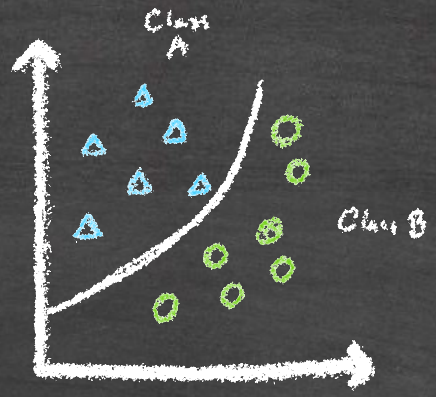
It is a highly flexible tool that can be applied in a vast variety of situations

It’s important to understand when to and why AI and ML should be applied so that you can take the best decisions for your organisation.

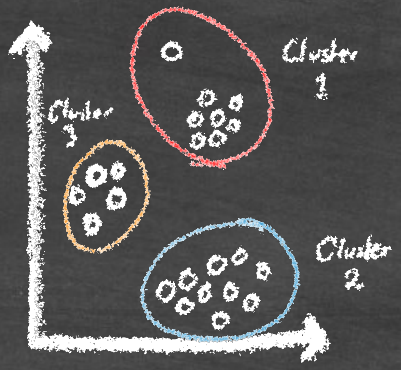
Regression



Classification

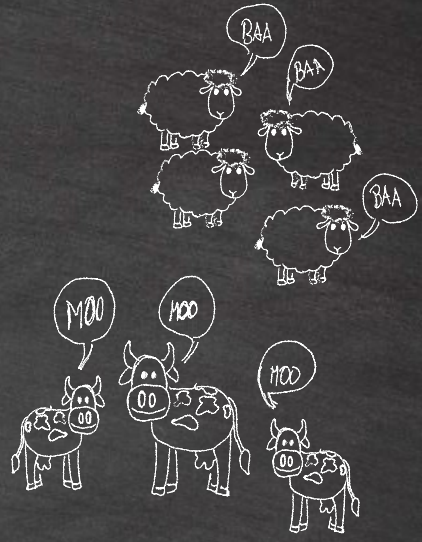


Clustering



Supervised

Unsupervised



Reinforcement

Seminar: AI and ML, task 1

1. ML in every day life

A) Go to your breakout room
B) Say hi to your team (3 min)
C) Brainstorm examples from your every day life that leverage machine learning. (Take 5 minutes first on your own and write down all the examples that you can think of before sharing them in the group (5 min)
D) Have the group come up with examples of problems that are:

- Regression
- Classification
- Clustering

E) Can you find examples from your every day life where you could incorporate machine learning? (Take 5 minutes first on your own and write down all the examples that you can think of before sharing them in the group 5 min)
F) Choose one of these examples from every day life where you could incorporate machine learning and brainstorm 5 variables or features that you "probably" would need in order to succeed with your model (5 min)

Seminar: AI and ML, task 2

2. ML in operations management

A) Go to your breakout room
B) Say hi to your team
C) Use your knowledge in operations management to find different areas in operations management where Machine learning could apply:

- Regression
- Classification
- Clustering

(Take 10 minutes first on your own to brainstorm, write down all the examples that you can think of before sharing them in the group (5 min)) (Tip) - Use previous lectures and topics as inspiration.
D) Choose one possible application and discuss it in your group. What possible caveats and pitfalls may you encounter if you were to try to build a machine learning model in this case. (Tip) use google to help you (why machine learning projects fail). Discuss in the group for 10 min

Seminar: AI and ML, task 3

3. ML in operations management.

- Go to your breakout room
- Now take one of your discussed cases from the former task use this example to “create” a toy model.
  - What input data would you need (what variables/features do you think will effect your “output”)
  - Search for a machine learning algorithm cheat sheet. Use this to define what type of algorithm you would us

https://docs.microsoft.com/en-us/azure/machine-learning/algorithm-cheat-sheet

Further readings: AI and ML

Read more: Towards data science

Listen: https://hbr.org/podcast/2018/08/designing-ai-to-make-decisions.html

Find datasets: Kaggle

Learn (No/low code): Microsoft Machine Learning Studios (classic)