Introduction to Artificial Intelligence

What is AI?

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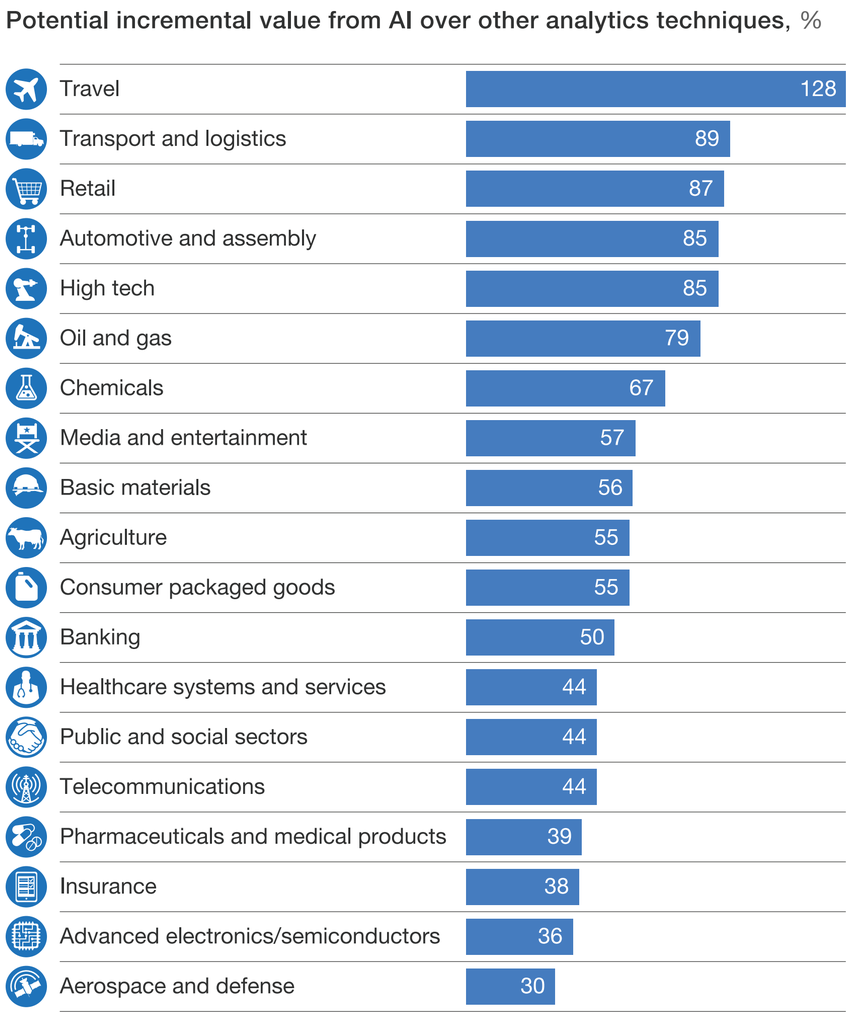
Learning Objectives

After this lecture and practicing with the supplementary material you should be able to understand:

- The difference between computer programming, machine learning and modern AI (deep learning)?
- What are the different stages of designing an AI model?
- How can you approach AI in practice?

Why AI ?



Source: McKinsey Global Institute analysis

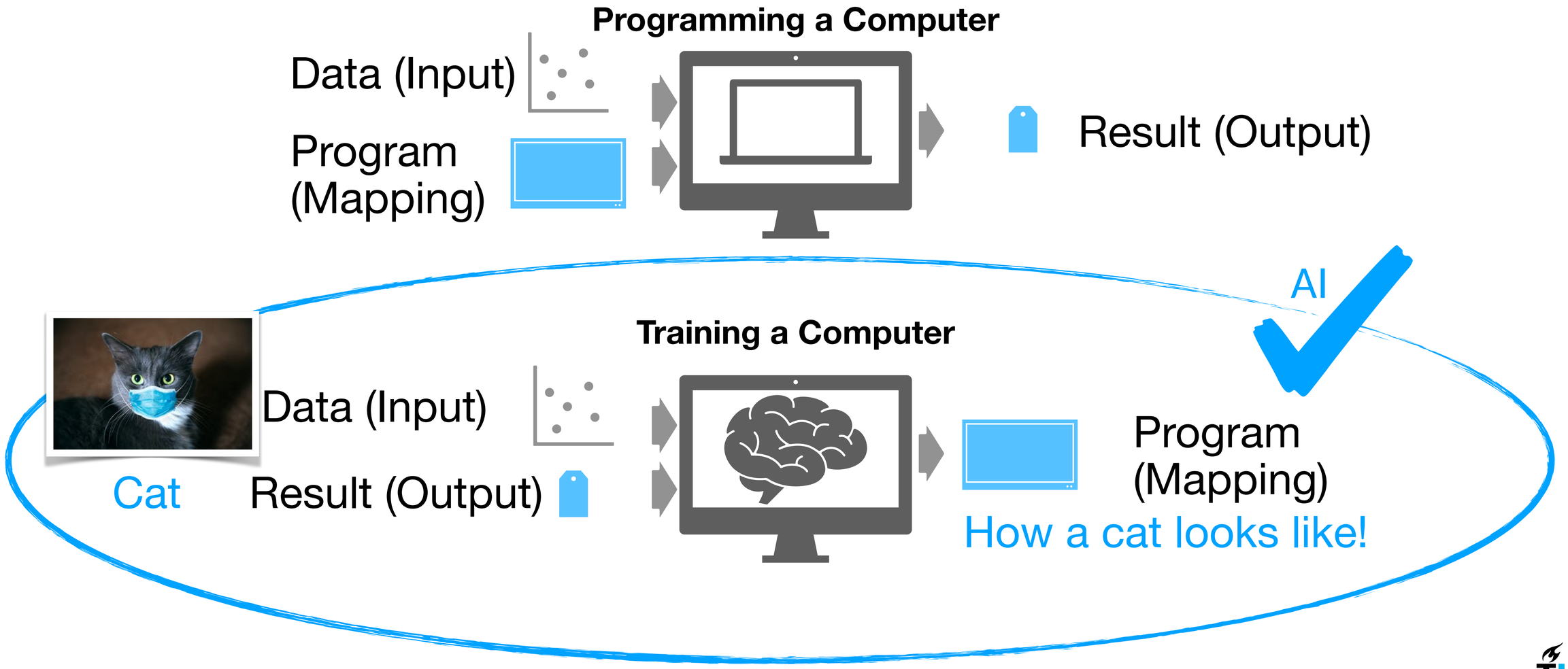
- In total $3.5 - $5.8 trillion in revenue is expected annually across different businesses using modern AI (deep learning).
- Most additive value falls outside the software industry!

Q: What is the economic additive value of AI in the architecture engineering and construction (AEC) industry?

Q: What about added societal value for good and evil? Created and lost jobs? Privacy, safety, ethics of AI?

TU Delft

Computer Programming vs Training



Scholarship Project Example

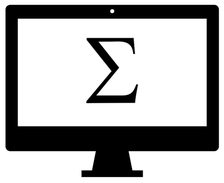
Programming\Machine Learning\Deep Learning

Accept

Reject

- GPA
- Portfolio Quality (PQ)
- Age
- Loans

2000



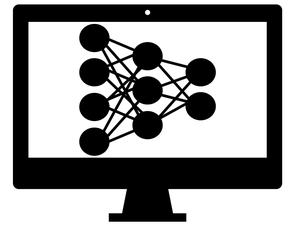
Computer Programming

Score = W1* GPA + W2* PQ + W3* Age +W4*Loans

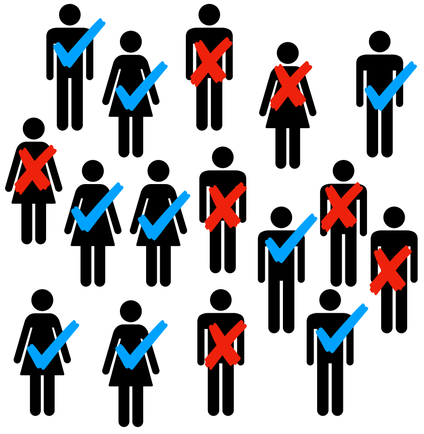
David.S> Sara.S>Tom.S>Linds.S>Cees.S>Jan.S

2010

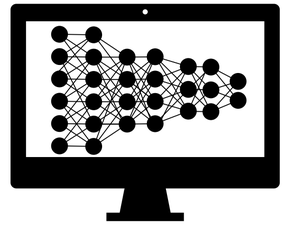
Machine Learning
(Supervised Learning)



2020

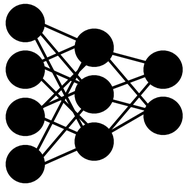
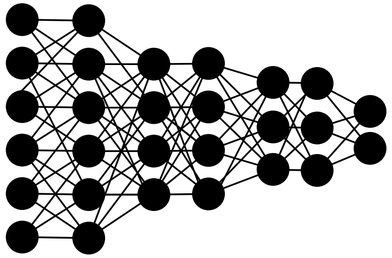


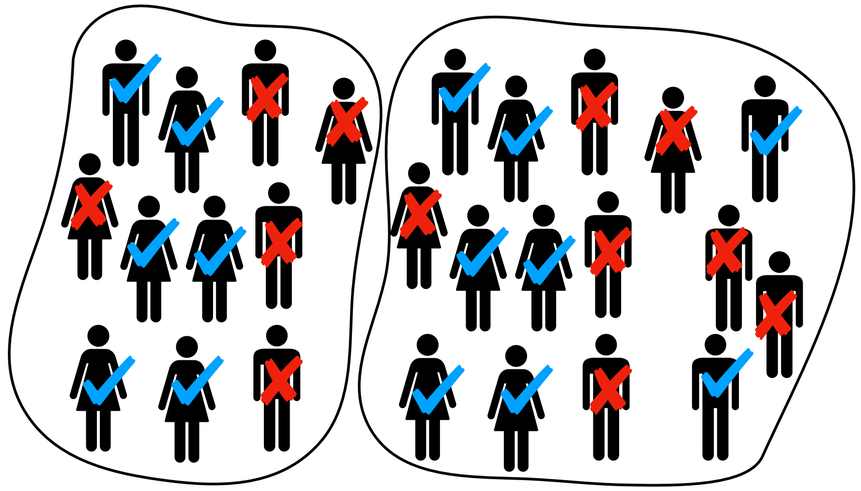
Deep Learning
(Neural Networks)



Quantitative Evaluation

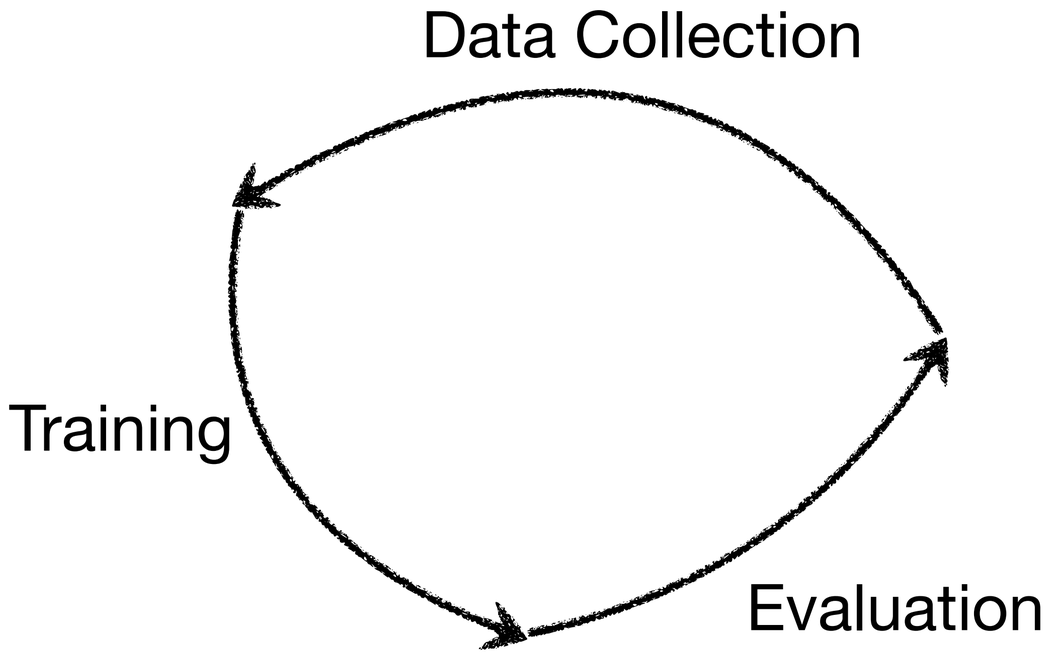
Q: Which ML model do you choose?

	Model	Accuracy	
0	Σ	75%	✗
1		85%	✓
2		99%	✓



Summary

Method \ To solve	Features	Rules
Computer Programming	Human	Human
Machine Learning	Human	Machine
Deep Learning	Machine	Machine



Supplementary Material

- Please go to this GitHub repository for supplementary material, which is an interactive coding platform running on Google cloud, and try a simple machine learning project that is prepared for you.

- You do not need any programming platform in your local computer or coding skills for this experiment. Just enjoy the magic of cloud computing!

Assignment

- Formulate the “**visual building recognition**” task as a ML/DL (your choice!) project by answering the following questions:
    1. What task the computer needs to solve?
    2. What is the input data?
    3. What is the output result?
    4. How humans perform this task? What visual features do you use?
    5. Can you think of handcrafted features for computer to perform the building recognition?
- Make one slide and present it at the classroom for at most 5 minutes.

Good luck and see you soon!