

Intro lesson

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Welcome!

Practicalities

This Lesson

- Machine Learning overview

- Focus of this course

- Example

Conclusion

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- ▶ 3 hours lecture per week
- ▶ each lecture (except this one) contains:
 - ▶ A quiz
 - ▶ Theory part (I talk and draw on the board, you ask as many questions as you like).
 - ▶ DIY part (python, I work in Jupyter notebooks)
 - ▶ Some things to read/look at before next lesson (tested in the next lesson quiz)
- ▶ Attendance is not compulsory but strongly advised, most theory is given by me talking

Course Material (Canvas)

- ▶ Slides
- ▶ Project assignment (on Canvas)
- ▶ Exercises (on Canvas)
- ▶ Example analysis notebooks

First exam opportunity

- ▶ 30% on permanent evaluation
 - ▶ Quizzes each lecture
 - ▶ Small take home assignments (usually when progress in class is slow, so up to you how many)
 - ▶ 1 or 2 bigger take home assignments
 - ▶ 1 large project (end of semester)
- ▶ 70% oral exam (theory + maybe some questions on your large project)

Retake

- ▶ 100 % project + oral exam

Lesson Topics

Exploratory data analysis Pre-Processing Data Leakage	Machine Learning Performance evaluation Cross-Validation Feature Selection
	Forecasting

Welcome!

Practicalities

This Lesson

Machine Learning overview

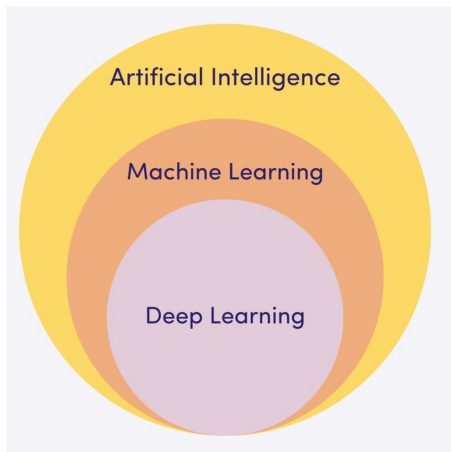
Focus of this course

Example

Conclusion

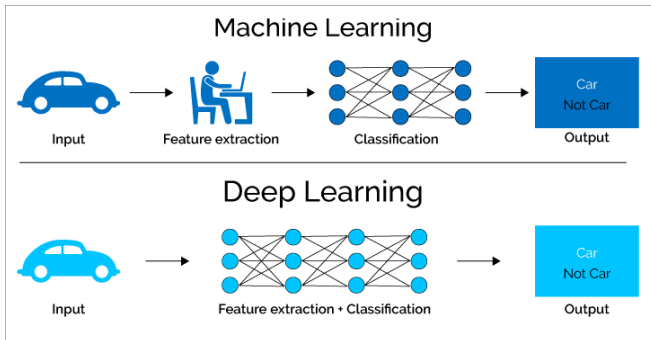
AI vs ML

Before we start:



Source: levity.ai

Before we start:



Source: [softwaretestinghelp](https://www.softwaretestinghelp.com)

Different types of learning

- ▶ Unsupervised Learning
- ▶ **Supervised Learning** (focus of this course)
- ▶ Reinforcement Learning

A short and very incomplete overview of Machine Learning

Many different types of ML aims:

- ▶ clustering (unsupervised)
- ▶ computer vision (detecting cancer in images, self driving cars)
- ▶ Natural Language Processing (Lernout & Hauspi / Alexa / Siri)
- ▶ **Classification** (**binary** / multi-class)
- ▶ Recommender systems

Welcome!

Practicalities

This Lesson

Machine Learning overview

Focus of this course

Example

Conclusion

Binary Classification

- ▶ Supervised ML (Labels are known in learning phase)
- ▶ Aims to predict labels of new data
- ▶ Matrix format of data (rows X features)

Welcome!

Practicalities

This Lesson

Machine Learning overview

Focus of this course

Example

Conclusion

Example



Figure: This is a flower

See Canvas notebooks for ML example

Outline

Welcome!

Practicalities

This Lesson

- Machine Learning overview

- Focus of this course

- Example

Conclusion

That's it!

By next lesson, read the following sources

- ▶ <https://towardsdatascience.com/exploratory-data-analysis-8fc1cb20fd15>
- ▶ <https://www.itl.nist.gov/div898/handbook/eda/section1/eda11.htm>
- ▶ <https://r4ds.had.co.nz/exploratory-data-analysis.html>
(this is in R, ideas still hold for python where you can make similar plots)