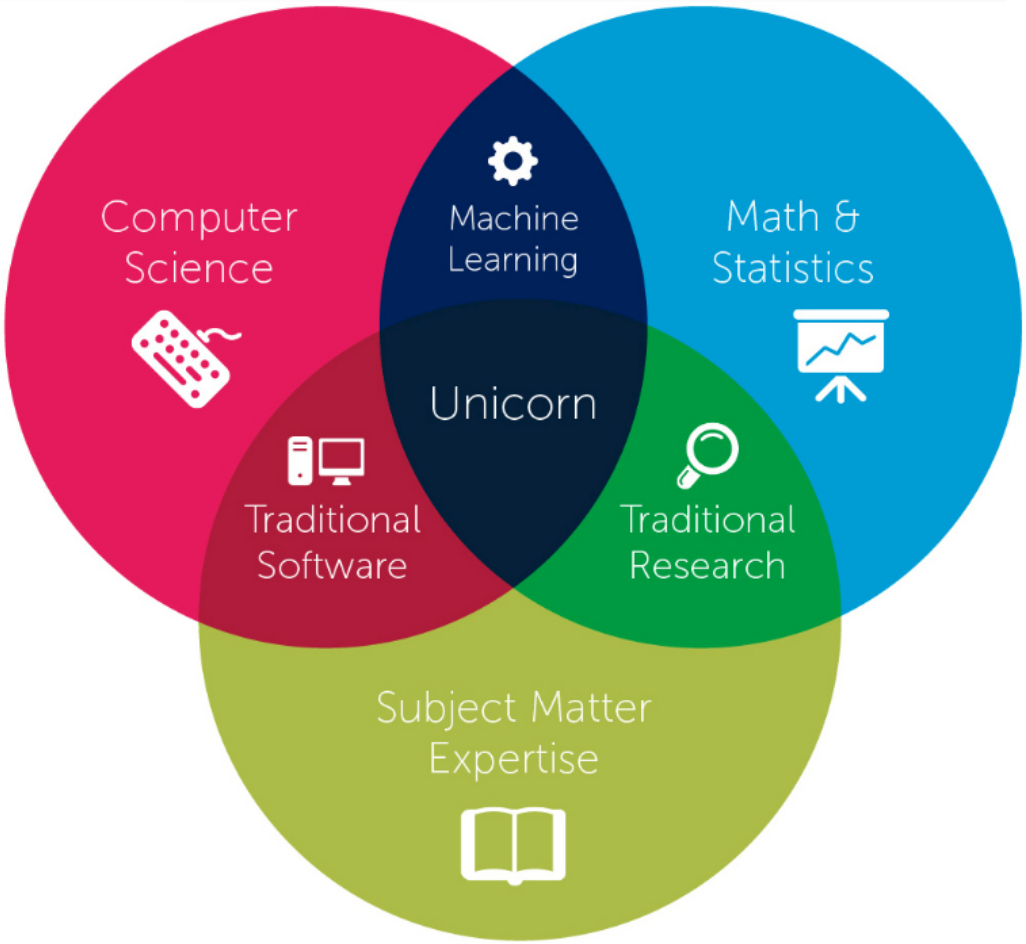
Big data project

Introduction

LIÈGE université

Data science



Your superpower?

Answering business or scientific questions with data.

Data science, in practice

- In practice, this process involves several steps:
  - Understanding and formalizing the problem
  - Defining a model
  - Collecting, cleaning and storing data
  - Choosing a technology
  - Analyzing the results
  - Storytelling and visualization
  - Iterate
- In this project, we will ask you an open and incompletely defined question and you will go through all these steps to form an answer.

Understanding and formalizing

- What is it that I really want to answer?
- Why do I want an answer to this question?
- Do I understand the problem?

Defining a model

- How do I answer?
- What are my assumptions?
- What statistical model do I consider?
- What algorithm shall I use?

Collecting, cleaning and storing data

- What data do I need for fitting my model?
- How large this data should be?
- Where do I collect this data?
- Is data cleaning necessary?
- How do I store the data?

Choosing a technology

- What tools do I need?
- What technology shall I use?
- Is a laptop enough, or shall I use a large-scale distributed system?
- How do I make my analysis reproducible?

Analyzing the results

- How do I analyze the results of the model?
- How do I assess the significance of the results?
- To what do I compare?
- What are the conclusions?
- Is this convincing?
- Does this corroborate with previous studies or intuition?

Storytelling and visualization

- How do I present my results?
- How do I make interpretable visualizations?
- How do I present my results to a non-technical audience?
- How do I make my results and conclusions as simple as possible, but not simpler?

Iterate

- Is this conclusive?
- Am I going in the right direction?
- Shall I go back and define a new model?
- ... or collect new or more data?
- ... or use other tools?

Your project this year

Does sunshine make us happy?

Organization

Activities

- Teams of 3 students. -
- Monthly project reviews of the progress.
  - Oral presentation
    - 10mn
    - Q&A
    - Everyone must present at least once
  - Short report
    - 4 pages max
  - Feedback on technical progress and project management.
- Seminars by local and external speakers.
  - Topics: big data, data science, visualization, communication, domain-specific presentations, etc.
  - Presence at the seminars and intermediate reviews is mandatory.
- Writing of a final report.
- Defense of the project.

Schedule

- 30/10: Presentation of the project
- 20/11: Review 1
  - Explain your objectives and roadmap
  - Oral presentation
  - Short report
- 11/12: Review 2
- 19/02: Review 3
- 19/03: Review 4
- 16/04: Review 5
- 14/05: Final report and defenses

Reports to be sent on the Friday before the review dates.

Seminars will be announced later.

Evaluation

The evaluation will be based on:

- the intermediate review meetings (progress achieved, quality of project management) (30%)
- the quality of the final report (15%)
- the quality of the final oral defense (15%)
- the overall solution (40%)
    - the originality, methodology, clarity, reproducibility and technological choices of the solution will be mainly assessed.

Brainstorming