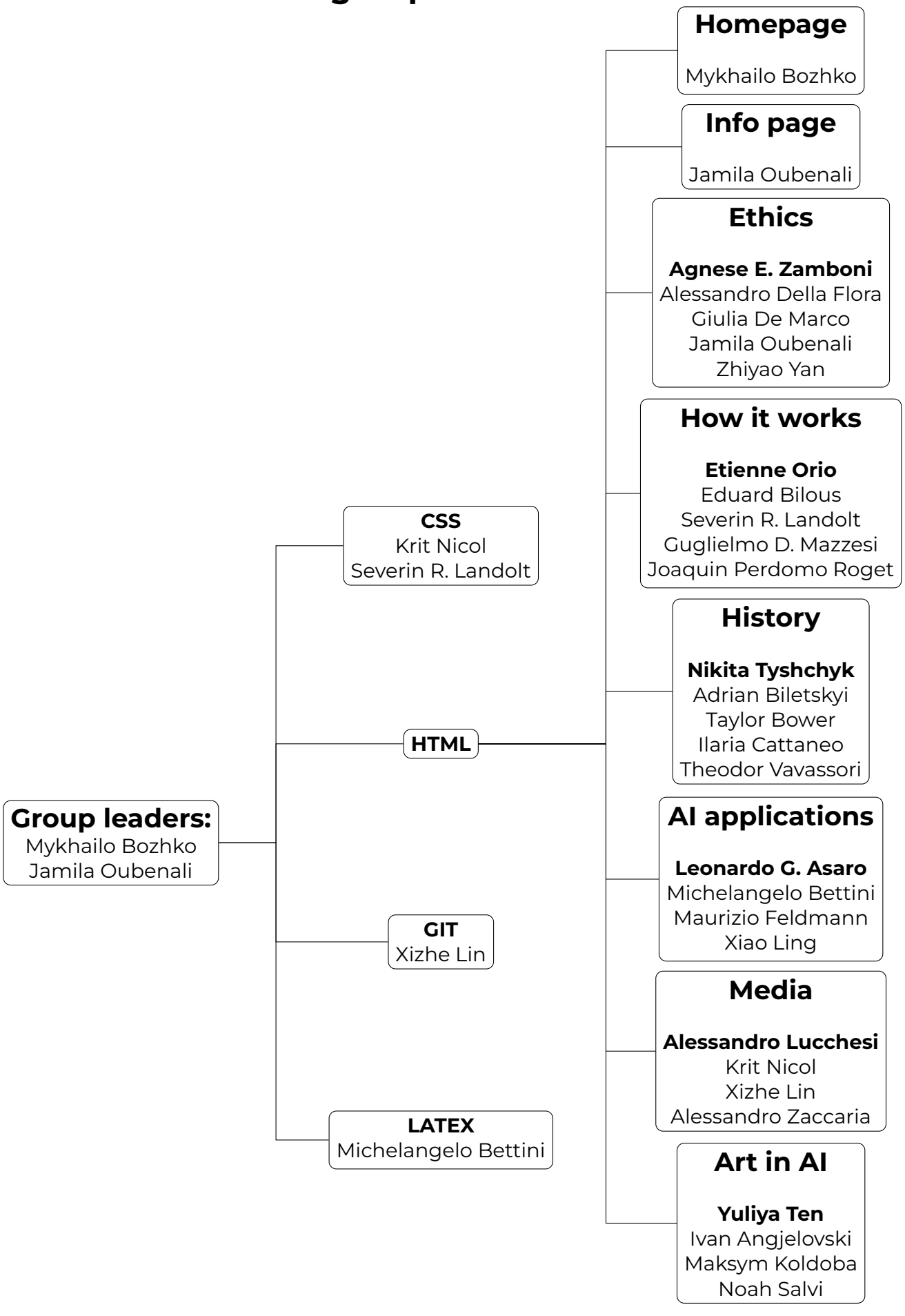
Organization schedule

Group 2

November 2022

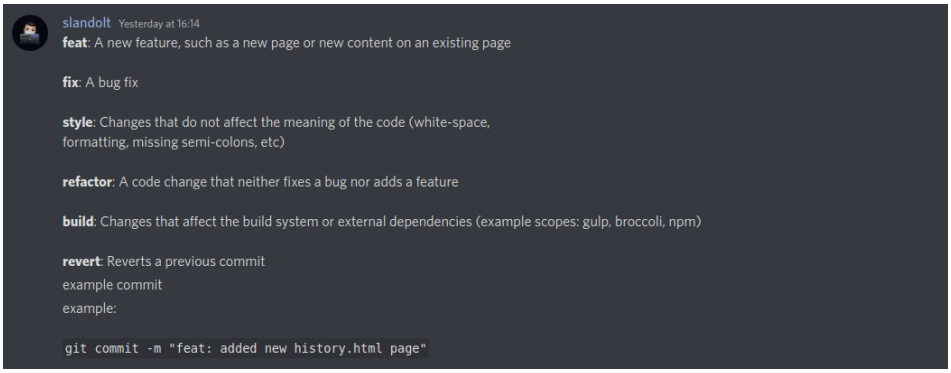
Contents

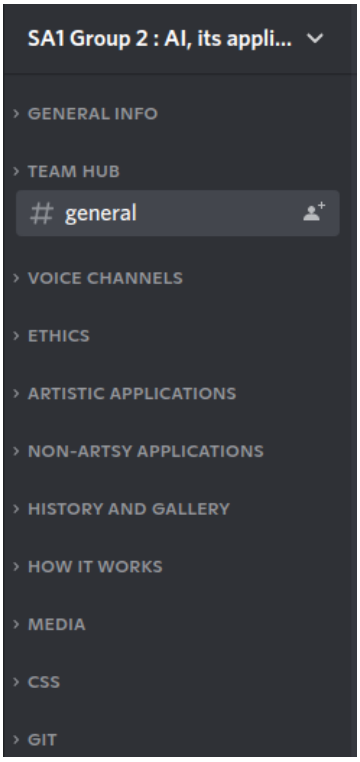
1 Structure of the group

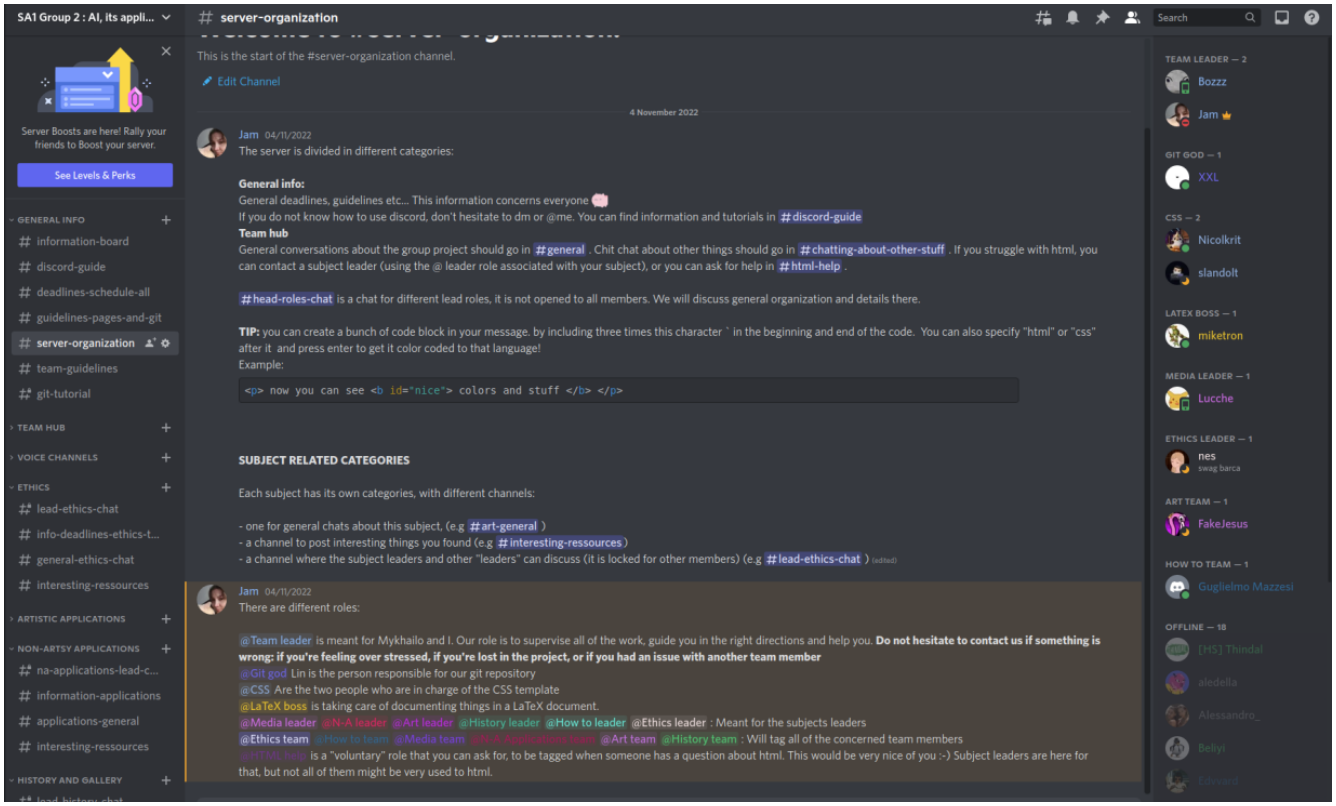


1.1 Communication

The Group uses a Discord server for official communications, which is divided into Categories with its own channels for every subject. There is also a summary of guidelines that should be respected by everyone while using git, and creating pages. Also all group members are encouraged to thoroughly track their sources, and make their commit messages as readable as possible. This communication method is integrated by also a Whatsapp group in case there was a need to reach out to an unresponsive teammate.







2 Internal deadlines

Disclaimer: The internal deadlines may vary.

2.1 Before Monday 07.11

- Everyone researches their assigned subject and discusses it with their subject leaders to get an idea of what the topics will be.
- The CSS team works on the CSS template, discusses the general appearance of the website with all the other group members to define all the needed features.

2.2 Monday 07.11 (20h00)

- The Subject leaders will submit a document with the structure of their website part and estimate how many pages their group might write for this.
- The Subject leaders will also communicate to the CSS team about their "design ideas", i.e. a general description of how their typical page layout may look like and what components will be used the most.

What to work on after this deadline:

- Every team member keeps researching their subjects.
- The Subject leaders and team members will have to expand the the topics proposed with more in-depth research. After that the teams will divide amongst them the workload.
- In the meantime the group leaders will organize the presentation for Friday 11.09.

2.3 Wednesday 09.11

- Group meeting presenting the git repository to explain all members how to use it, and how to use the templates.
- (20h00) The CSS team must present the completed CSS file, and a few webpage templates.
- (20h00) The LaTeX team has to send the organization document to the Group leaders.
- (20h00) The Group leaders must send via email the address of the GIT repository.

2.4 Friday 11.11

- The team leaders and group leaders meet up to review the feedback, talk about the final plan and smooth over the final details.

2.5 Saturday 12.11

- All the group members should start writing their code.

2.6 Thursday 17.11(12h30)

- All the group members must submit their code and start debugging it.
- The team leaders should review the code of their team.
- (18h00) Meeting of the team leaders.

3 Topics

3.1 Ethics

- **Ethics in Artificial Intelligence** - Agnese E. Zamboni
  - Introduction
- **Responsible A** - Alessandro Della Flora
  - What are ethics in AI, why is it important
  - Should AI replace job positions?
  - Ethics of autonomous weapons
  - The trolley problem with self-driving cars
- **Explainable AI** - Agnese E. Zamboni
  - What is explainable AI (XAI), why is it important?
    * Opaque artificial intelligence : black-box / white-box machine learning
    * It is important to be able to explain the reason behind the decision of an AI machine to understand what it actually does
    * Explainability tools
    * Garbage-in garbage-out
  - Garbage-in garbage-out explanation and examples
- **Data sets and Algorithmic bias** - Giulia De Marco
  - What are data sets and how it can be biased
  - College admissions
  - Apple face recognition works poorly with asian/black people
  - COMPAS (correctional offender management profiling for alternative sanctions)
  - Examples of bad data sets
- **Misuse of AI** - Zhiyao Yan
  - What is it? how use of AI with bad intentions can be dangerous
  - Deepfake
  - Password Guessing
  - Human Impersonation for monetary gain
  - AI-supported hacking
- **Initiatives to improve ethics in AI** - Jamila Oubenali
  - List of initiatives

3.2 How it works

- **"Vanilla" Neural networks** - Joaquin Perdomo Roget
    - Layers
    - Activation functions
    - Forwardpropagation
    - Output layer functions
- **Training** - Etienne Orio
    - Loss function
    - Gradient descent
    - Chain rule
    - Backpropagation
- **Training techniques** - Guglielmo D. Mazzesi
    - Optimizers
    - Initial weight values
    - Regularization
    - Validating Hyperparameters
- **Convolutional neural networks** - Eduard Bilous
    - Problem with fully connected layers
    - Convolutional layer
    - Pooling layer
    - Visualizing a CNN
- **Natural Language Processing** - Severin R. Landolt
    - Introduction to NLP
    - NLP Comparison
    - Types of NLP
    - The frontier of NLP

3.3 History

- **380 BC - 1950** | Nikita Tyshchyk
- **1950 - 1970** | Ilaria Cattaneo
- **1970 - 1990** | Adrian Biletskyi
- **1990 - 2010** | Taylor Bower
- **2010 - present** | Theodor Vavassori
- Famous people
  - ➔ Nikita Tyshchyk:
    - **Cynthia Breazel**
    - **Yutaka Matsuo**
    - **Dacheng Tao**
    - **Elon Musk**
  - ➔ Ilaria Cattaneo:
    - **Donald Olding**
    - **Richard Socher**
    - **Anita Schjøll Brede**
    - **Anna Scaife**
    - **Edward Feigenbaum**
  - ➔ Theodor Vavassori:
    - **Alan Turing**
    - **Fei-Fei Li**
    - **Rita Cucchira**
    - **Jurgen Schmidhuber**
    - **IBM(company)**
  - ➔ Adrian Biletskyi:
    - **Dorian Selz**
    - **Demis Hassabis**
    - **Andres Hardebring**
    - **Robin Li**
    - **Claude Elwood**
  - ➔ Taylor Bower:
    - **Rodney Brooks**
    - **John McCarthy**
    - **Martin Minsky**
    - **Yann LeCun**
    - **Ross Quillian**

3.4 AI applications in the field

➔ Xiao Ling:

- **Trading**
  - Support Vector Machines
  - Artificial Neural Networks in the stock markets
  - Technical Analysis and Pattern Recognition as aid to investors
  - Algorithmic trading
  - High Frequency Trading
- **Education**
  - Differentiated and individualized learning offered by AI
  - Universal access to lectures for students of different nationalities
  - Technical Analysis and Pattern Recognition as aid to investors
  - Automation of admin tasks
  - Tutoring and support outside the class

➔ Leonardo G. Asaro:

- **Self-driving vehicles**
  - Self-driving cars
  - Autonomous flight
- **Traffic data analysis**
  - Google Maps' traffic analysis
  - AI in traffic management

➔ Michelangelo Bettini:

- **Factory Automation**
  - Forecast of errors and disruptions
  - AI trained image recognition for quality checks (citation to Quality Control)
  - Use of AGVs (autonomous guided vehicles) inside factories
  - Use of AI for generative design
  - Reduce waste and costs whilst being more efficient
- **Quality Control**
  - Visual Inspection AI by Google, applied in different fields
- **Warehouse Management**
  - Inventory management
  - Material handling
  - Processing and packaging
  - Supply chain
  - Demand planning

➔ Maurizio Feldmann:

- **Medicine**
  - Improve diagnostics
  - Manage population health
  - Accelerate drug discovery
  - modernize care Infrastructure
- **Cybersecurity**
  - Threat detection
  - Breach Risk Prediction
  - Advantages of using AI in this field
  - Automation of bot detection
  - Behaviour profiling

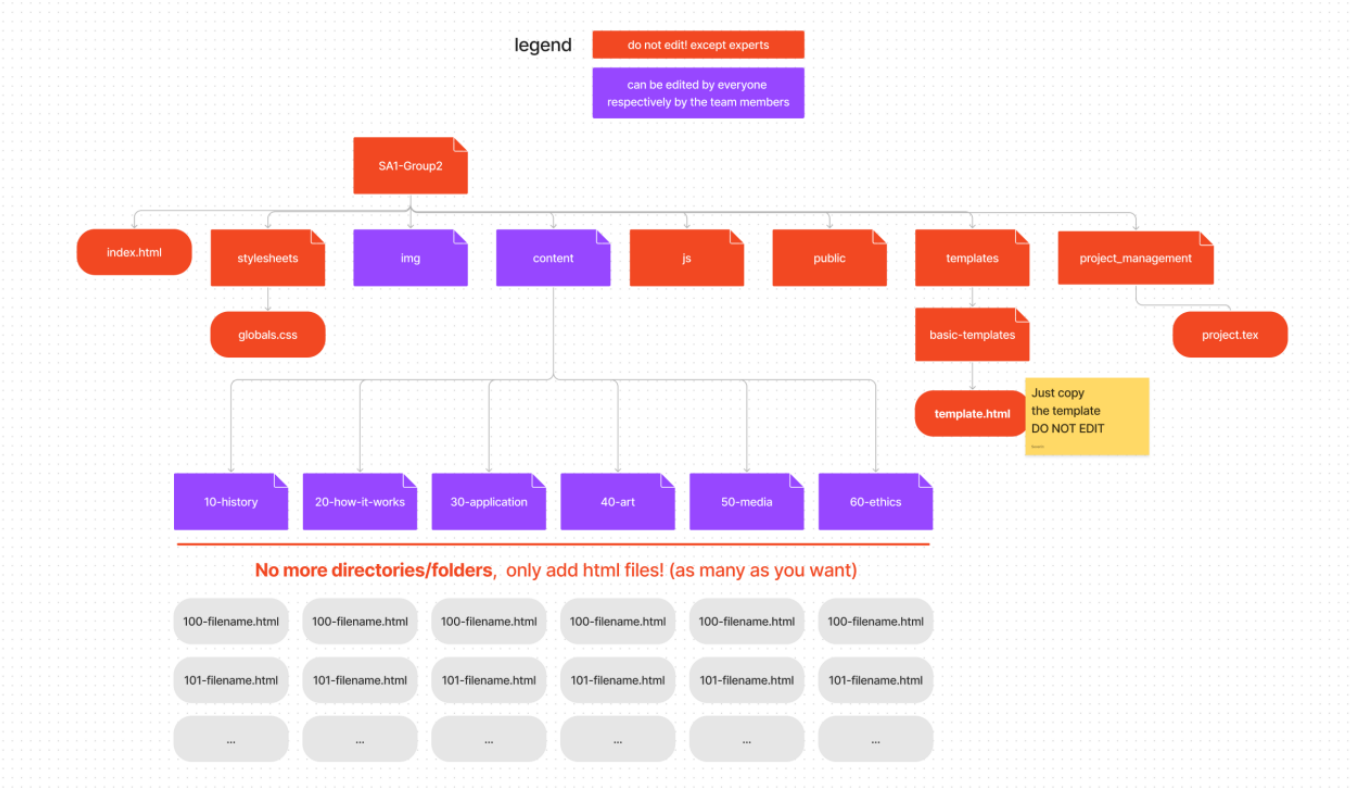
3.5 Media

- **Introduction** - Alessandro Lucchesi
- **Marketing** - Krit Nicol | Xizhe Lin
  - How it's used
  - Examples
  - Use in dating apps
  - Use in song streaming
- **Politics** - Alessandro Lucchesi
  - Cambridge Analytica scandal
  - Malicious software using social media
- **Examples** - Alessandro Zaccaria
  - Linkedin social experiment
- **How it's changing traditional media** - Xizhe Lin
  - Automated journalism

3.6 Art in AI

- **Images** - Yuliya Ten
  - Creating
  - Editing
  - NFT
- **Videos** - Ivan Angjelovski
  - 4D stuntman
  - AI based films
- **Literature** (NLP)Now - Ivan Angjelovski
- **Music** - Noah Salvi
  - Voice alteration
- **Games** - Maksym Koldoba
  - RTX + DLSS

4 GIT repository structure



5 Template page

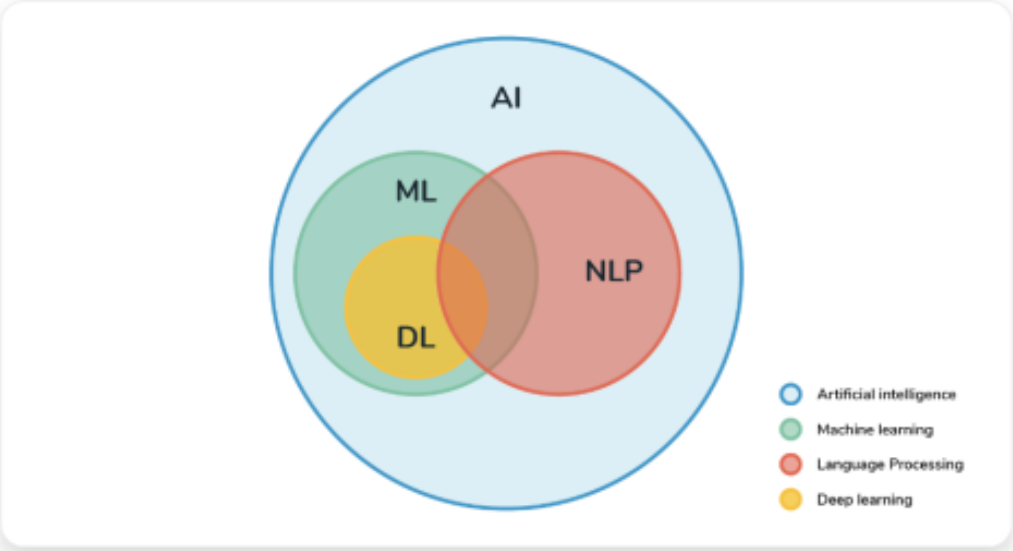
 # Navbar: To be defined; Will be added later

ETHICS

Manipulation of Behaviour

Severin Landolt • 07.11.2022

The ethical issues of AI in surveillance go beyond the mere accumulation of data and direction of attention: They include the use of information to manipulate behaviour, online and offline, in a way that undermines autonomous rational choice. Of course, efforts to manipulate behaviour are ancient, but they may gain a new quality when they use AI systems.[1] Given users' intense interaction with data systems and the deep knowledge about individuals this provides, they are vulnerable to "nudges", manipulation, and deception. With sufficient prior data, algorithms can be used to target individuals or small groups with just the kind of input that is likely to influence these particular individuals. A 'nudge' changes the environment such that it influences behaviour in a predictable way that is positive for the individual, but easy and cheap to avoid (Thaler & Sunstein 2008). There is a slippery slope from here to paternalism and manipulation.[2]



Trolley Problem

6 HTML & CSS example

```html
<html lang="en">
</head>

<body class="overflow-x-hidden scrollbar">
  <header class="text-center fst-italic text-info" style="margin-top: 40px;">
    <p># Navbar: To be defined; Will be added later</p>
  </header>
  <section class="container mt-5">
    <div class="row">
      <div class="md-col-8 col-11 mx-auto text-center">
        <!-- YOUR PAGE STARTS HERE -->
        <p class="font-black text-uppercase topic-tag">
          Ethics
        </p>
        <h2 class="font-black" style="font-size: 35px;">
          Manipulation of Behaviour
        </h2>
        <p class="text-secondary mt-4">
          Severin Landolt &bull; 07.11.2022
        </p>
      </div>
    </div>
  </section>

  <div class="container mt-5 justify-content-center">
    <div class="row justify-content-center">
      <div class="col-11 col-lg-7">
        <p class="paragraph">
          The ethical issues of AI in surveillance go beyond the mere accumulation of data and direction of attention:
          They include the use of information to manipulate behaviour, online and offline, in a way that undermines
          autonomous rational choice. Of course, efforts to manipulate behaviour are ancient, but they may gain a new
          quality when they use AI systems.<sup>1</sup> Given users' intense interaction with data systems and the deep
          knowledge about individuals this provides, they are vulnerable to "nudges", manipulation, and deception. With
          sufficient prior data, algorithms can be used to target individuals or small groups with just the kind of
          input that is likely to influence these particular individuals. A 'nudge' changes the environment such that it
          influences behaviour in a predictable way that is positive for the individual, but easy and cheap to avoid
          (Thaler & Sunstein 2008). There is a slippery slope from here to paternalism and manipulation.<sup>2</sup>
        </p>

        <div class="text-center mt-5 mx-4 mb-5">
          <img class="img-fluid shadow transition border rounded-4 mb-3" src="../../img/nlpfield.png"
            alt="Trolley Problem" style="object-fit: cover;
                object-position: center;">
          <p class="rounded mx-auto fs-7 text-secondary">Trolley Problem</p>
        </div>

        <h3 class="fs-4 font-bold py-2 "># This is a title of a new section</h3>
```

```
stylesheets > {} globals.css > .scrollbar::-webkit-scrollbar-thumb:hover
263
264   .shadow-2:hover {
265     box-shadow: rgba(20, 184, 166, 0.4) 5px 5px, rgba(20, 184, 166, 0.3) 10px 10px,
266       rgba(20, 184, 166, 0.2) 15px 15px, rgba(20, 184, 166, 0.1) 20px 20px,
267       rgba(20, 184, 166, 0.05) 25px 25px;
268   }
269
270   .shadow-turing:hover {
271     box-shadow: rgba(204, 153, 204, 1) 5px 5px, rgba(102, 153, 204, 1) 10px 10px,
272       rgba(153, 204, 153, 1) 15px 15px, rgba(255, 204, 102, 1) 20px 20px,
273       rgba(249, 145, 87, 1) 25px 25px;
274   }
275
276   /* Translate Utilities */
277
278   .-translate-y-1:hover {
279     transform: translateY(-1px);
280   }
281
282   .-translate-y-3:hover {
283     transform: translateY(-3px);
284   }
285
286   /*Transition Utility */
287   .transition {
288     transition-property: all;
289     transition-timing-function: cubic-bezier(0.4, 0, 0.2, 1);
290     transition-duration: 150ms;
291   }
292
293   .glow:hover {
294     color: rgba(255, 255, 255, 1);
295     box-shadow: 0 5px 15px rgba(145, 92, 182, 0.4);
296   }
297
298   .paragraph {
299     line-height: 2;
300     color: #475569;
301   }
302
303   sup {
304     color: #14b8a6;
305     font-weight: 600;
306   }
307
```