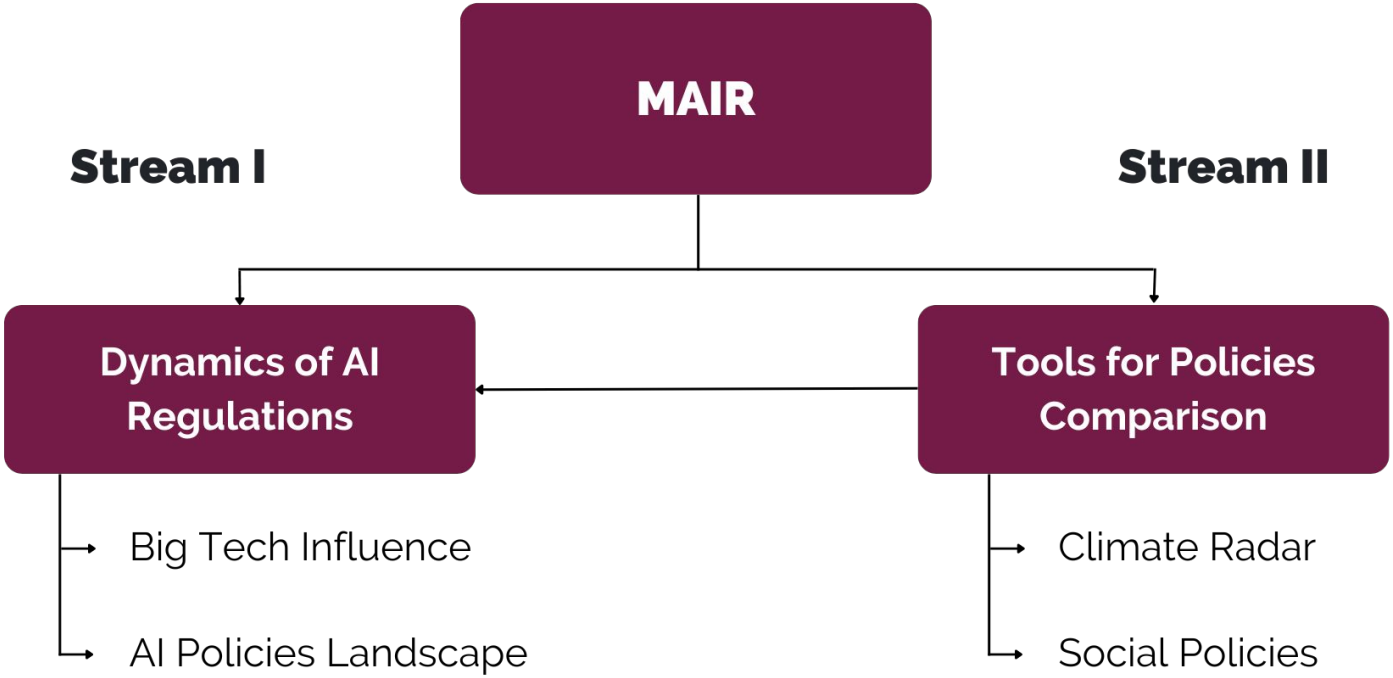
ATLAS

Automated documen**T** ana**L**ysis for soci**A**l re**S**ponsibility

MI²DataLab Winter Seminar 2022

MI

Create qualitative and quantitative **NLP tools** for efficient and **automated analysis of documents** to **increase social responsibility** and awareness

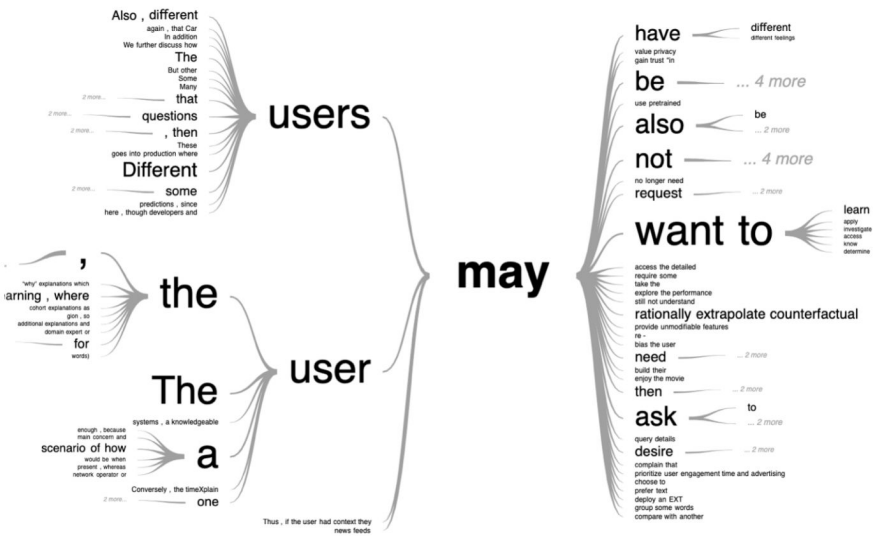

MAIR
Stream I
Stream II
Dynamics of AI Regulations
Tools for Policies Comparison
Big Tech Influence
AI Policies Landscape
Climate Radar
Social Policies

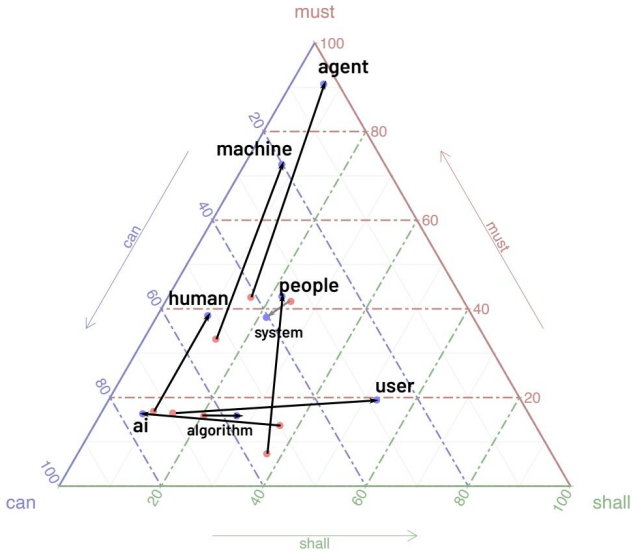
Stream I

Uncovering Influences and Dynamics in AI Regulations

Initial work

MAIR: Framework for mining relationships between research articles, strategies, and regulations in the field of explainable artificial intelligence





Stanisław Giziński

The Plan

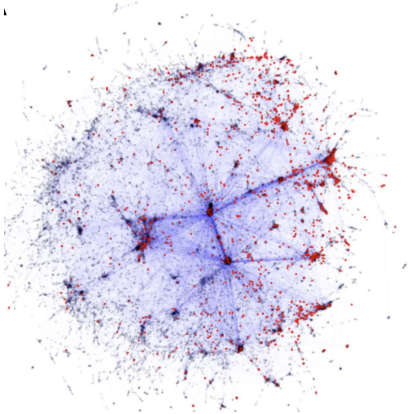
The problem was too big to attack in one shot. The solution: divide the work.

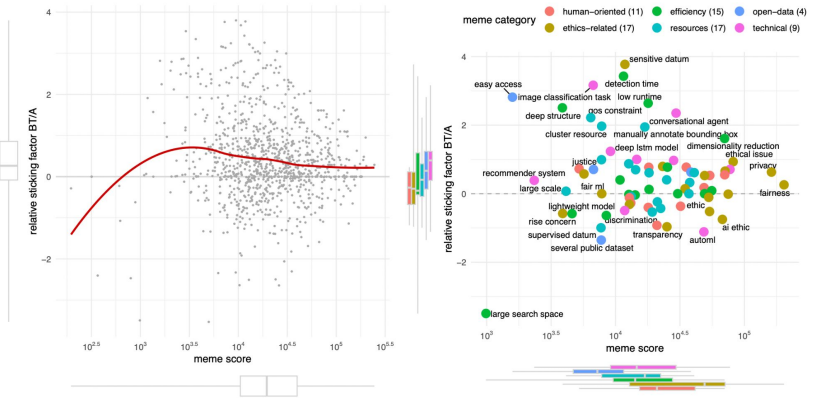
1. **AI papers' network analysis** – what type of actors has particular influence and how does this influence manifest?
2. **AI public policies' analysis** – how countries approach AI and in what manner?
3. **Combine both** – how does influence over AI research translate to influence over AI policies?

How does Big Tech influence AI research?

In this work, we wanted to understand which ideas are spread by big tech companies in AI research papers.

We leverage NLP to extract ideas from papers in the network, and then measure their “infectiousness” depending on who is talking about them.





Stanisław Giziński

Analysis of AI policies' landscape

Research questions:

1. What issues do different countries raise in AI policies, and how do they approach them?

2. Are there any clusters across countries' approaches to AI policies, correlating with specific political, economic, cultural, or geographic features?

3. Could we identify patterns across time, such as particular countries following specific trends in their approach to AI policies?

Stanisław Giziński

Analysis of AI policies' landscape

Dataset – Overton

- 2948 **AI related documents** from 2015 to 2022
- authored by **governments, international organizations and NGOs**
- originating **from multiple countries around the world** (most of them from Europe, US and several other technologically advanced countries like Canada, Japan, Singapore, India)
- different document types such as **regulations' drafts, working papers and national strategies**
- each document has **links to other documents**

Stream II

Tools for Efficient and Automated Analysis of Documents

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Policy Comparison

Project genesis: Case Study course, track: NLP in social sciences

Motivation:

1. Increasing number of policy documents
2. Tediousness of manual analysis of documents
3. Limited citizen governance and restricted accessibility for the society

Objective:

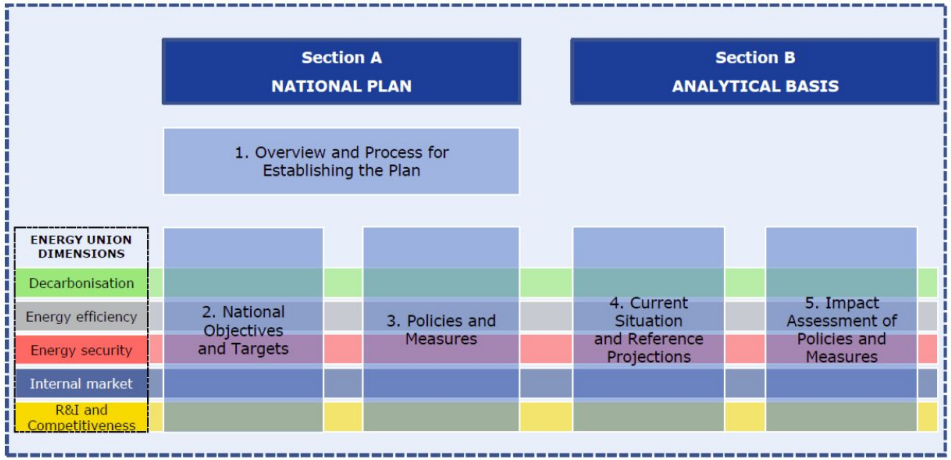
Creating **a set of tools** (the entire **pipeline**) that will allow to c**reate a comparative analysis of documents** with a strictly defined structure, utilising clearly defined format.

Emilia Wiśnios

Policy Comparison: Climate Policy Radar

Document: National Energy and Climate Plan

- period: 2021-2030
- 27 documents
- one per EU Member State
- ~ 250 pages each



Emilia Wiśnios

Policy Comparison: Climate Policy Radar

Objective:

- summarization, finding policy frames
- comparing between countries
- finding countries with similar attitude
- revealing important nuances

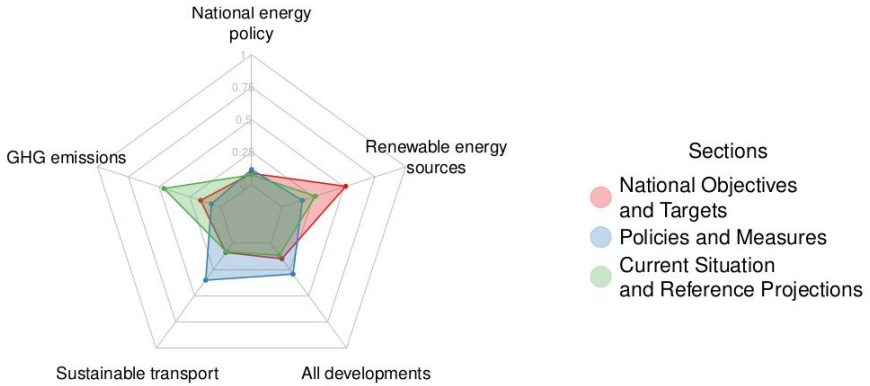
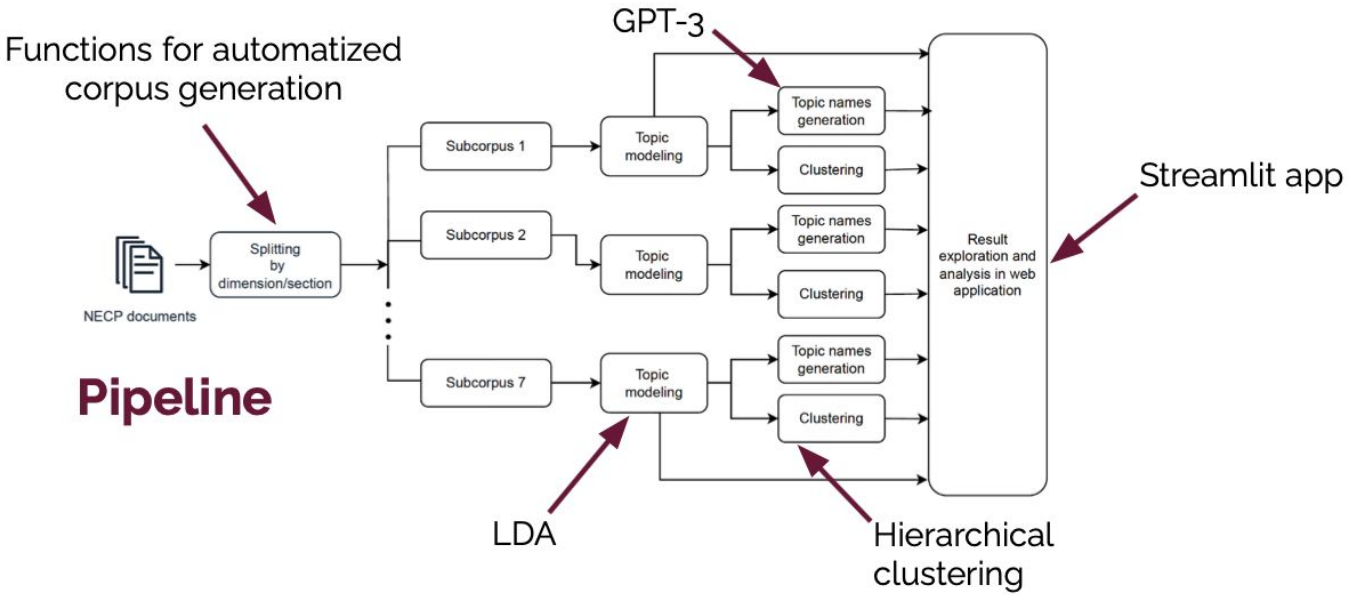


Figure 5: Topic distributions by section in the *Decarbonisation* dimension for Finland.

Emilia Wiśnios

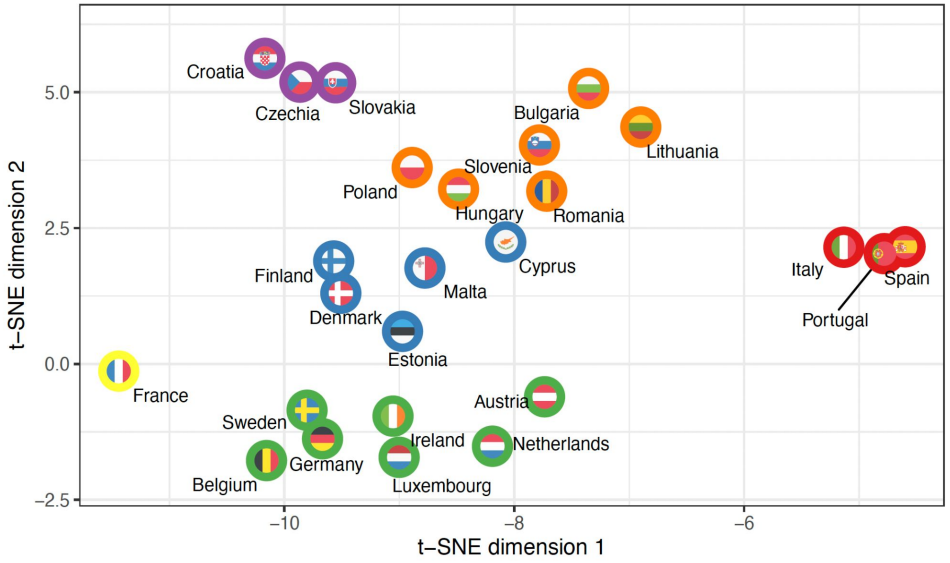
Policy Comparison: Climate Policy Radar

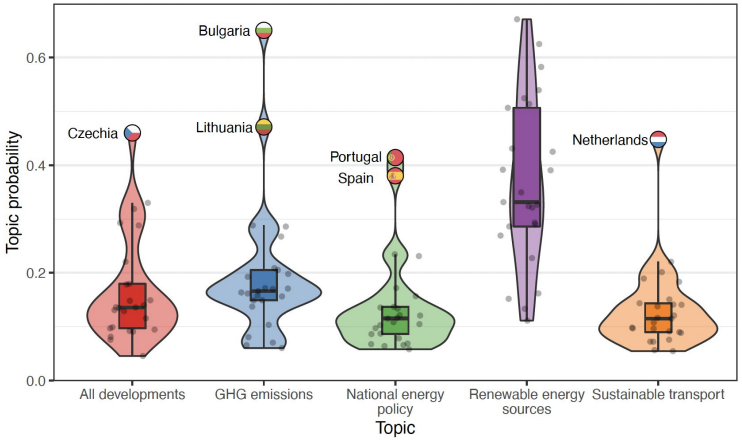


A. Żółkowski, M. Krzyziński, P. Wilczyński, S. Giziński, E. Wiśnios, B. Pieliński, J. Sienkiewicz, P. Biecek, ***Climate Policy Radar: Pipeline for automated analysis of public climate policies***,Tackling Climate Change with Machine Learning at NeurIPS 2022

Emilia Wiśnios

Policy Comparison: Climate Policy Radar





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Emilia Wiśnios

Policy Comparison: further plans

- Further development of the pipeline (valuable comment from reviewers)
  - Structural Topic Modeling
  - Climate BERT
- Generalization of proposed solution (other types of documents, in various domains)
- Another use case: social policies (B. Pieliński)

Emilia Wiśnios

Future

Combining the strengths of both streams in expert domain analysis

MI

Tracking the flow of ideas from AI research to AI policies

Initial research questions:

- How does influence on AI research translate to the content of policies?
- Which ideas in policy documents are correlated with citing particular research work?
- How big is the “cultural gap” between AI research and AI policies (how long does it take to take idea from research to policy)?
- Which ideas never make it to policies?

Stanisław Giziński

Discourse analysis of UNESCO proceedings

Project genesis: Bachelor thesis, Computer Science major at MIMUW

Motivation:

1. No existing studies on textual analysis of UNESCO proceedings
2. New methods in argument mining field
3. Huge, unexplored dataset for studying argument mining methods

Objective:

Creating a set of tools (the entire pipeline) that will allow to create analysis of documents of proceedings type (more details soon).

Emilia Wiśnios

Inspired Theses

Extending Our Knowledge Within and Outside MI²DataLab

MI

Explainable abstractive summarization of legal acts

Author: Emilia Wiśnios

Collaboration with **Inez Okulska, PhD** from NASK

Motivation:

Amount, structure and language of legal acts are **difficult to understand for people**. We want to make tools for responsible summaries of those documents.

Explainable abstractive summarization of legal acts

Three streams of work:

- Summary of changes with respect to the previous versions of the document
- Vanilla abstractive summary
- Contextualized abstractive summary (probably a new NLP task)

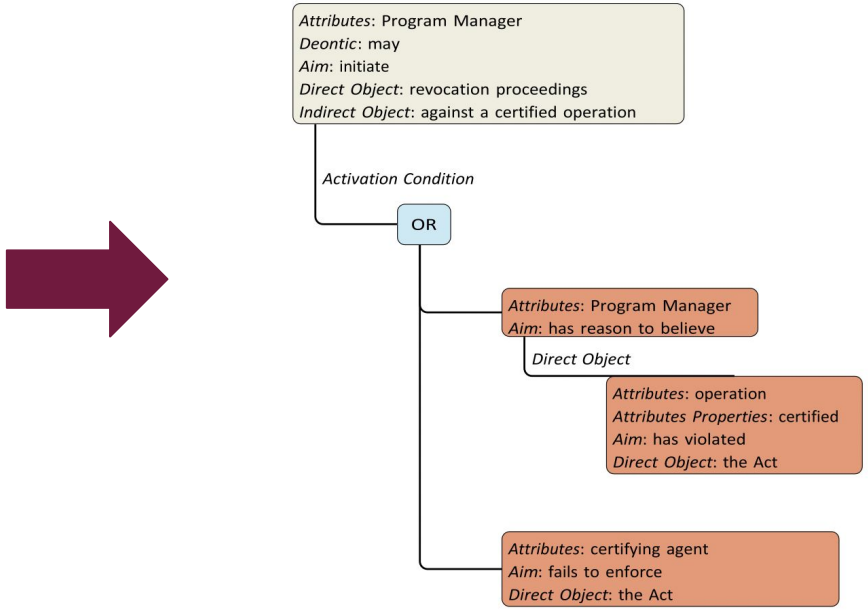
Our next seminar will be devoted to methods of explaining summarizations!

Emilia Wiśnios

Legal Logical Breakdown

Author: Stanisław Giziński

The Program Manager may initiate revocation proceedings against a certified operation when the Program Manager has reason to believe that a certified operation has violated the Act or when a certifying agent fails to enforce the Act.



Why do we cite who we cite?

Explainable temporal graph neural networks for author network and citation network.

Author: Paulina Kaczyńska

MSc Supervisor: Julian Sienkiewicz

Project Genesis: Continuing the topic of Big Tech influence over AI research

Methods:

- We want to utilize Explainable Graph Neural Network methods on networks of citations and networks of authors
- Prediction of who will cite whom in the next timestep

MI² Education

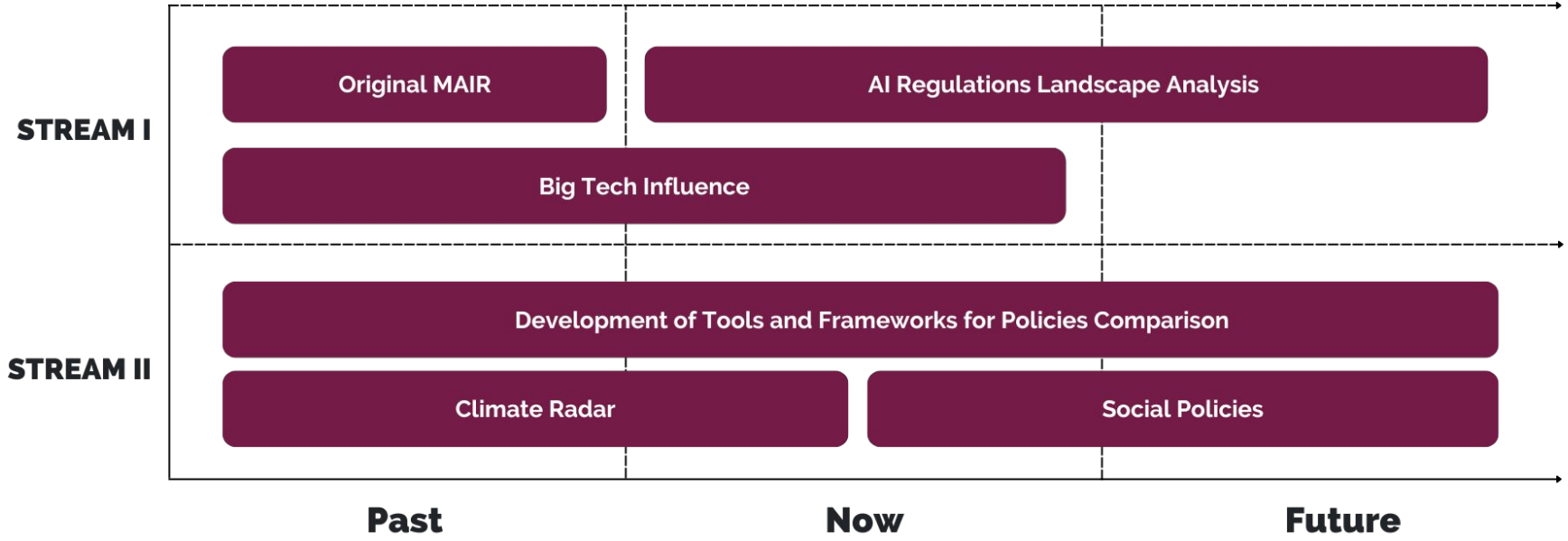
Reaching for Potential
Collaborations in Universities

Case studies (21/22) – NLP in Social Sciences

Developed projects:

1. Analysis of the European Union Countries' Climate Plans Using Topic Modeling
2. War in Ukraine – Twitter Analysis
3. What Makes Papers Cited More Frequently by Public Policies?
4. Topic Modeling on Press Releases

Projects 1 and 2 are further developed after the end of the course.


STREAM I
Original MAIR
AI Regulations Landscape Analysis
Big Tech Influence
STREAM II
Development of Tools and Frameworks for Policies Comparison
Climate Radar
Social Policies
Past
Now
Future

Questions?

MI