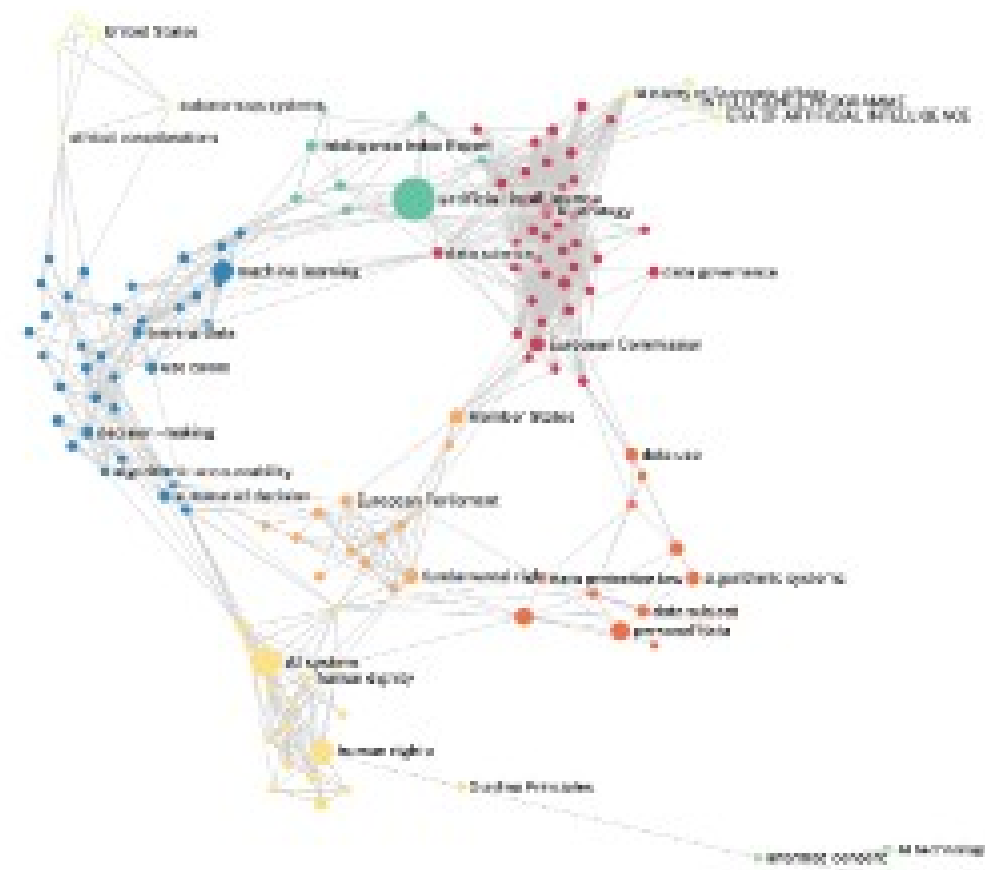# La pluralité de la critique environnementale de l'IA par ses producteur·ices

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Hi! I'm Tiphaine

- Associate professor at Telecom Paris in computational social sciences

- **Focus**: understanding AI as a sociotechnical system, graph mining, mixing qualitative (interviews) and quantitative approaches (graphs, NLP, ML)

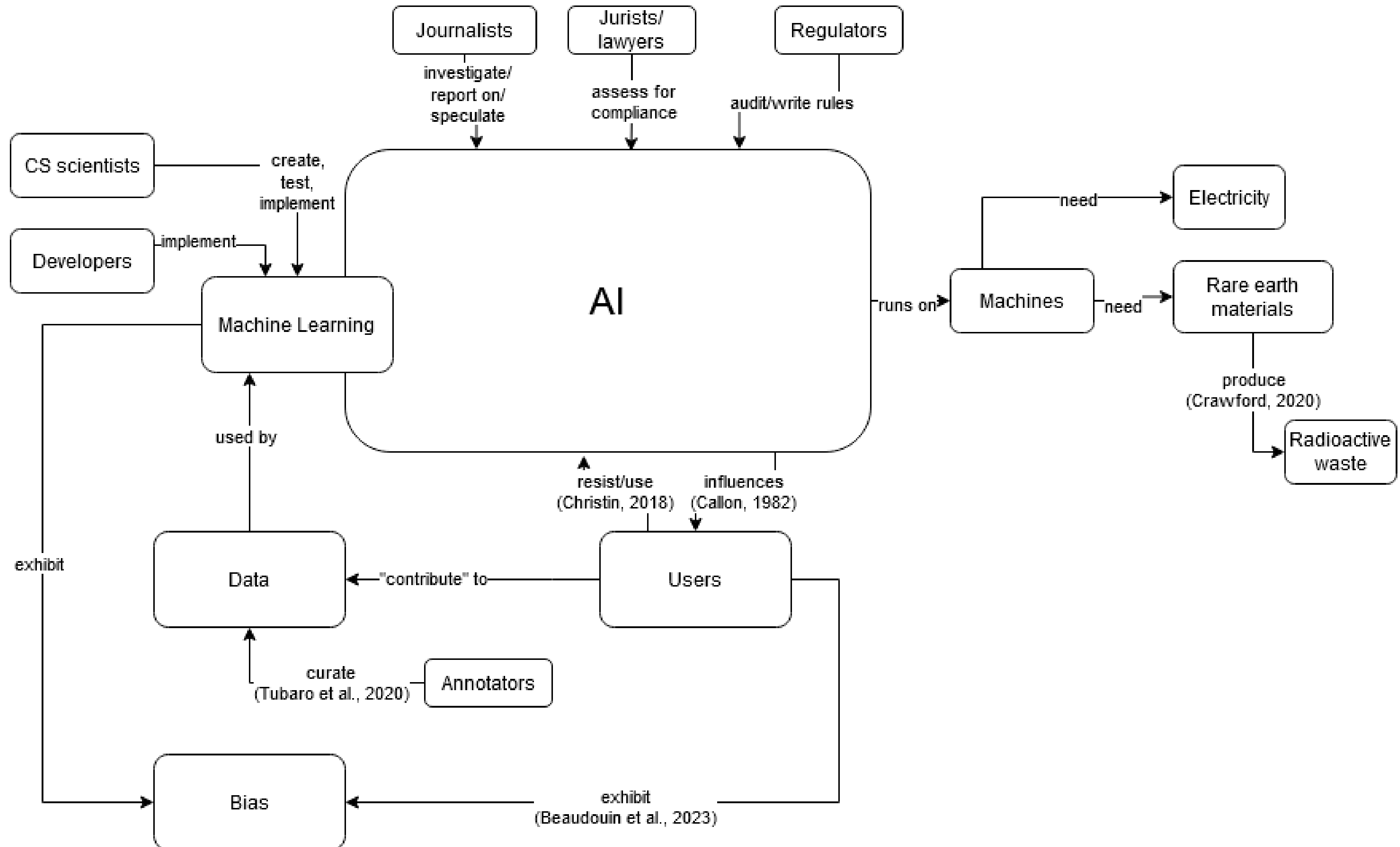Trajectory: PhD in computer science, now in a sociology lab

Sociotechnical systems and their analysis

- Studying technical objects in society: the focus of **Science and Technology Studies (STS)**

- **Framing** is important: where do technical objects start and end?

- The **reception** of technical objects cannot be ignored: uses emerge, evolve and disappear

- Citizens' attention, policy makers' attention are limited resources

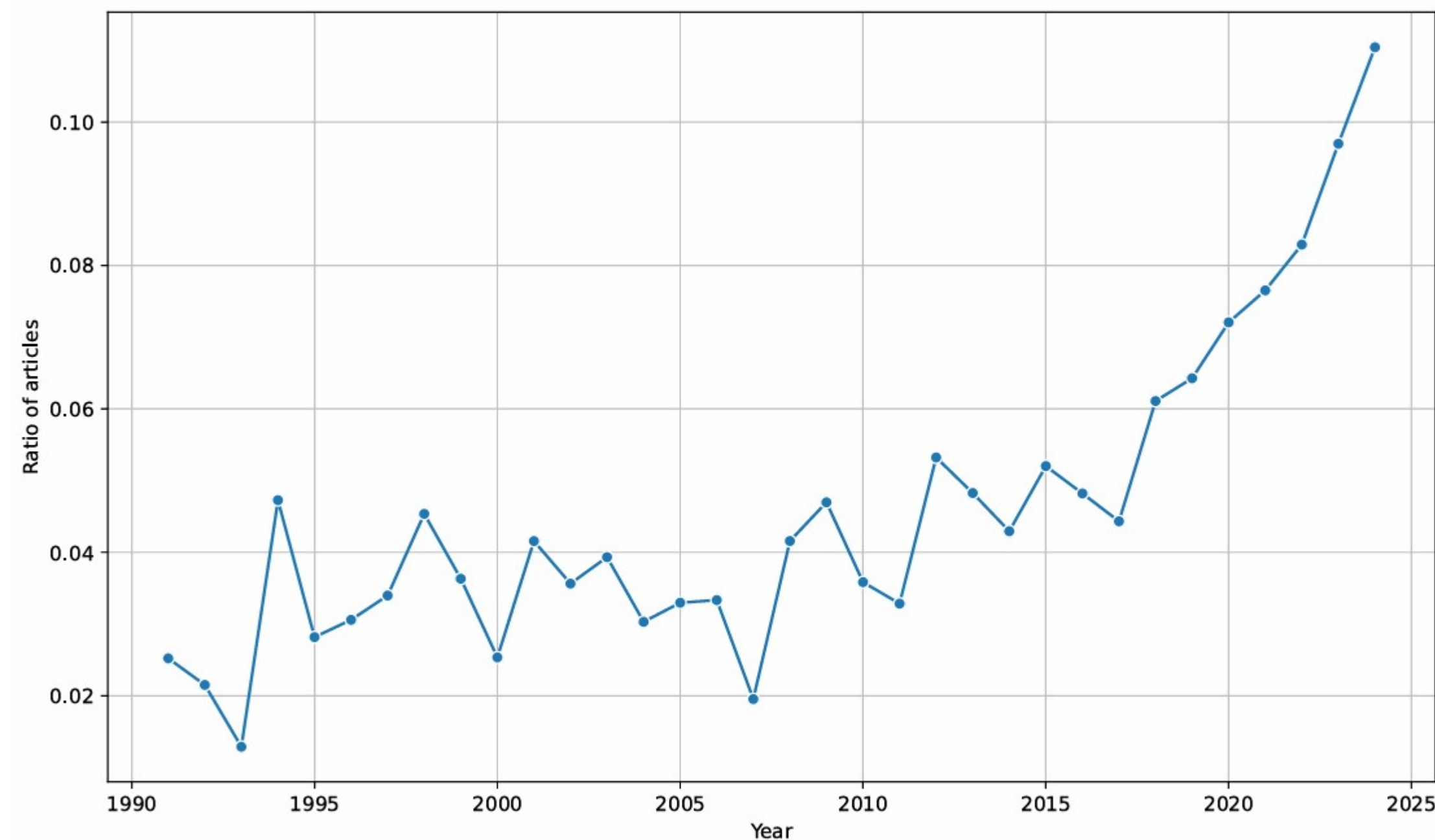- Decisions are taken in **sub-political spaces** (Beck, 1986)

The (incomplete) AI sociotechnical system

Understanding AI and environmental concerns

Barral, S., Bouleau, G., & Guillet, F. (2024). La sociologie de l'environnement. La Découverte.

Hardy, A., & Noûs, C. (2023). Quantifier la frugalité de la recherche?. Socio. La nouvelle revue des sciences sociales, (17), 83-117.

- Key questions:
  - What is the **legitimated scientific production** on the topic?
  - How do AI researchers **modify their professional practice** to deal with their concerns?
- A mixed methods inquiry:
  - **Diachronic publication network analysis** of ~9000 research papers mentioning "AI" and "environment"
  - **Semi-structured interviews** with ~20 researchers in France

- Joint work with Simon Delarue and Jean-Samuel Beuscart (thanks! :))

- Stakes in sociology of science, of work, of environment, of science and technology
  - **Expertise** is central in ecological concerns and protests (Barral et al., 2024)
  - Environmental concerns cause a **moral reconfiguration** of (computer) science (Hardy, 2024)

A theme that is becoming central

- **9314 articles** extracted from Web of Science
- Query on AI + environmental impacts / ecology in title or abstract
- Comparison point: papers in AI have boomed
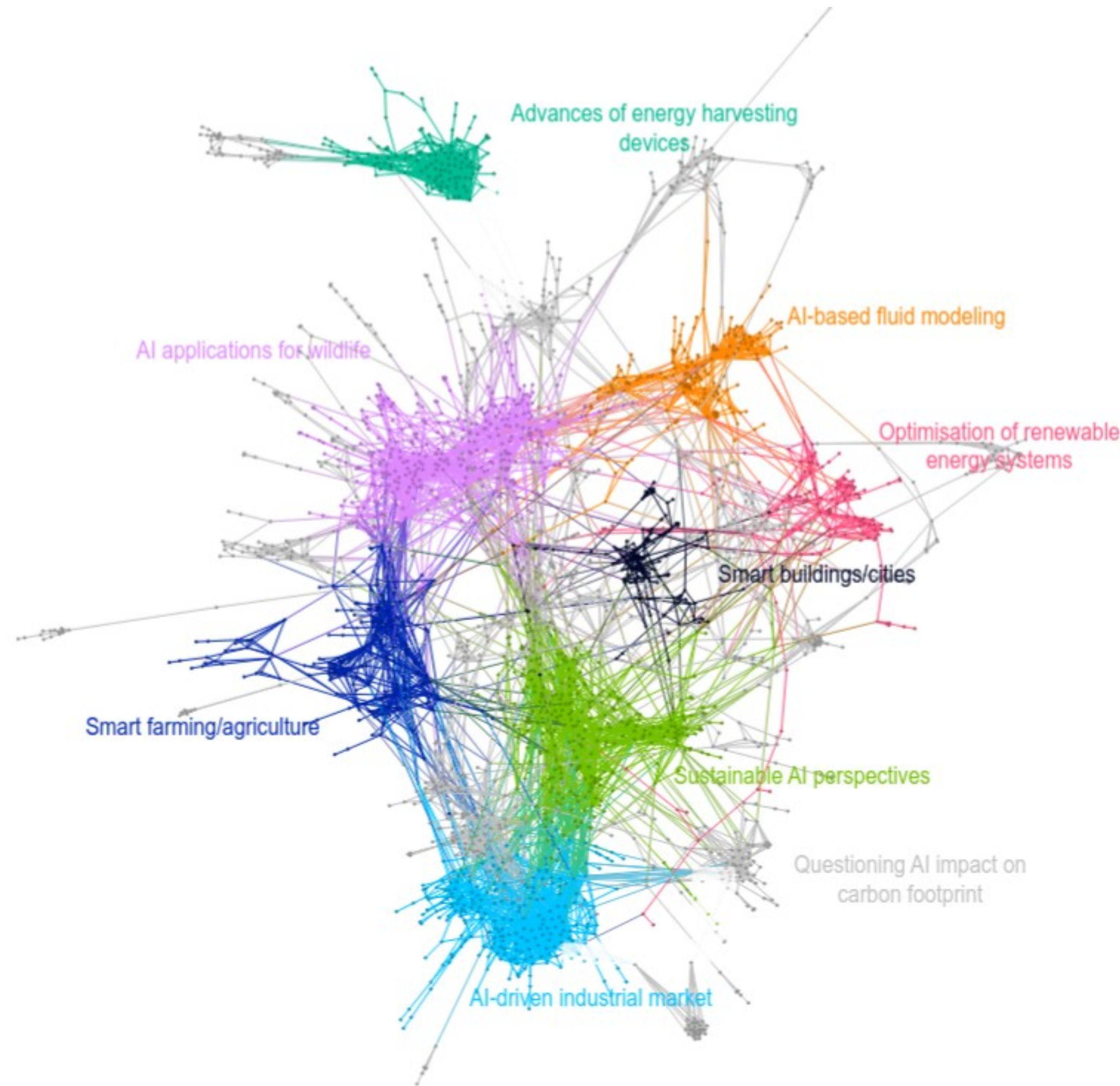
Different worlds of research

- GreenAI / frugal AI / AI4green
  - Material impact of AI is **a technical problem, calling for a technical solution**
  - Highlights a **"phasic"** view (Fressoz, 2024)
  - Tends to ignore rebound effects

- Green IT, networks & telecommunications
  - Develop methods for **quantifying ecological impacts**

- Life Cycle Analysis
  - Also focused on quantification, but also on **framing**
  - Tends to be more **critique** of AI / technosolutionnism

- Sociotechnical systems analysis
  - Calls for non-technical solutions, usually with a **stronger critique**
  - Aligns with analysis in **STS, critical philosophy**

**Challenge epistemic roots
of computer science:
abstraction and neutrality**

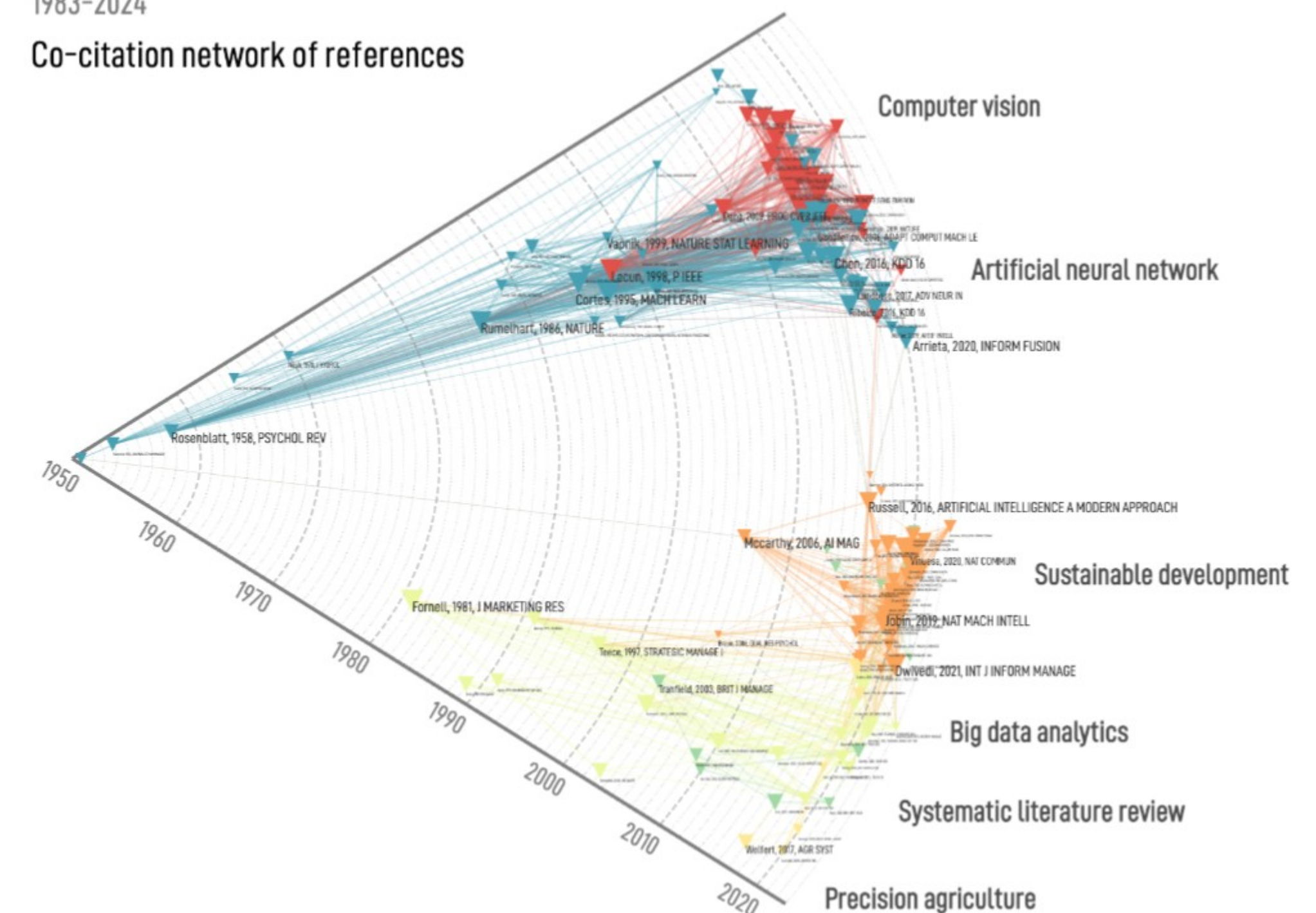# The materiality of AI research : publications

- Trends in AI research focus on **environmental concerns**

- Some trends: **frugal AI, carbon footprint estimates, "green AI", no AI**

Artificial Intelligence and climate change (WoS)
1983–2024
Co-citation network of references

The aporia of greenAI: "there is no 'bicycle of AI' "

Different worlds of research

- GreenAI / frugal AI / AI4green
  - Material impact of AI is **a technical problem, calling for a technical solution**
  - Highlights a **"phasic"** view (Fressoz, 2024)
  - Tends to ignore rebound effects
- A difficult reorientation : "there is no AI bicycle"
- Reorientation : from **"making AI" to "studying AI"**
- AI is an extreme manifestation of a **technosolutionnist** and "technogreedy" worldview: we need more performance, more data, more datacenters…
- With a **feedback loop**: "now the datacenters are made/ we have collected the data, we might as well use it"; close to results in *datacenter studies* (Marquet, 2018 ; Crawford, 2024); see Collingbridge dilemma

Faute de résultats, l'expérimentation de la vidéosurveillance algorithmique est prolongée

Elle n'a identifié qu'un ramasseur de champignons égaré

Apr 24, 2024 · Technology

Generative AI is still a solution in search of a problem

Scott Rosenberg

Legitimacy at stake

Professional legitimacy

- What kind of scientific production?

- What scientificity, result objectivation?

- Which community recognises these results as research?

- Close to **expert fields** (Bourdieu), scientific **legitimacy** (Merton)

Personal legitimacy

- Capacity to talk/research on a new topic

- "Betrayal" of institution and scientific community

- How can one get proficient in social science methods?

- How to separate the political from the scientific?

A plurality of actions & difficulties

- **Research**: creation/existing conferences: ICT4S, Undone CS, Archipel; groups of service and research EcoInfo identified as central

- **Teaching**: reverses legitimacy issues, **teaching allows researchers to be students again**; brings agentivity

- **Local committees**: unions, sustainability referee

- **Rejection** : quitting research, a PhD thesis, stopping publishing, taking a sabbatical

- **Clubs, collectives**: ex. ecopolien, atécopol, IA-Pau...

- **Research**: delegitimation from former community: "those who go there aren't the best", but also institutional changes

- **Teaching**: with varying institutional support, risks of greenwashing

- **Local committees**: with varying institutional support, risk of getting drowned in "local" questions

- **Rejection** : difficult and radical; tenured staff perceives difficulty for students & postdocs who "need to secure a career", but non-tenured staff tends to accept this radicality

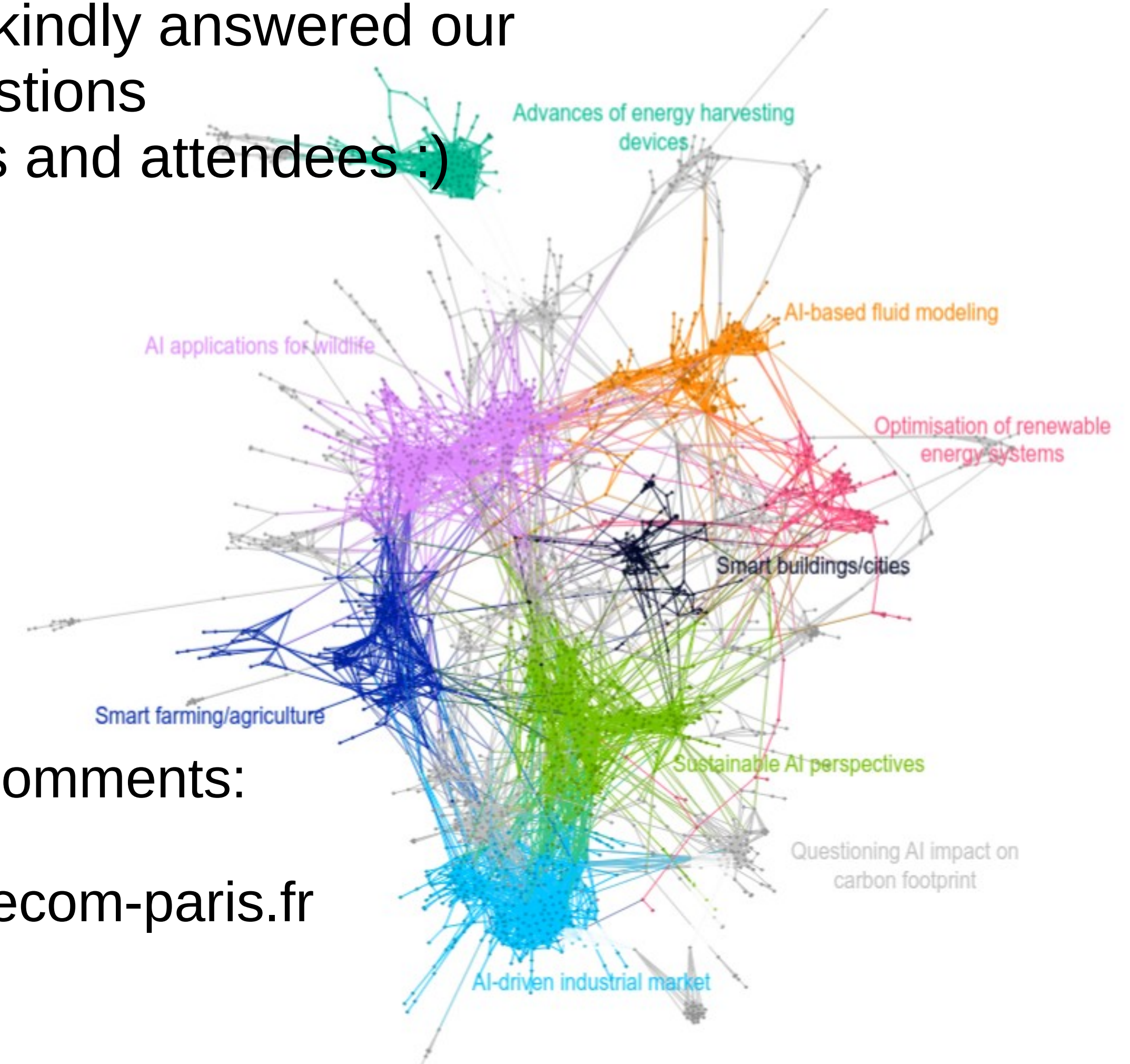- **Clubs, collectives**: seen as secondary to professional activity, on "personal time"

Thank you!

Many thanks to my coauthors, Simon Delarue &
Jean-Samuel Beuscart
And to all the persons who kindly answered our
(lengthy) questions
And to today's organisers and attendees :)

Any questions, comments:

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Freins

- Recherche : peu de conférences spécialisées, manque de reconnaissance des travaux et des méthodes (« ceux qui y sont allés, c'est pas les meilleurs »)

- Enseignement : soutien institutionnel variable

- Instances locales : soutien variable, risque de se noyer dans des enjeux très localisés

- Rejet : arrêt de la recherche, abandon de thèse, absence de publication, de review, pause

- Association / groupes libres : annexe à l'activité professionnelle