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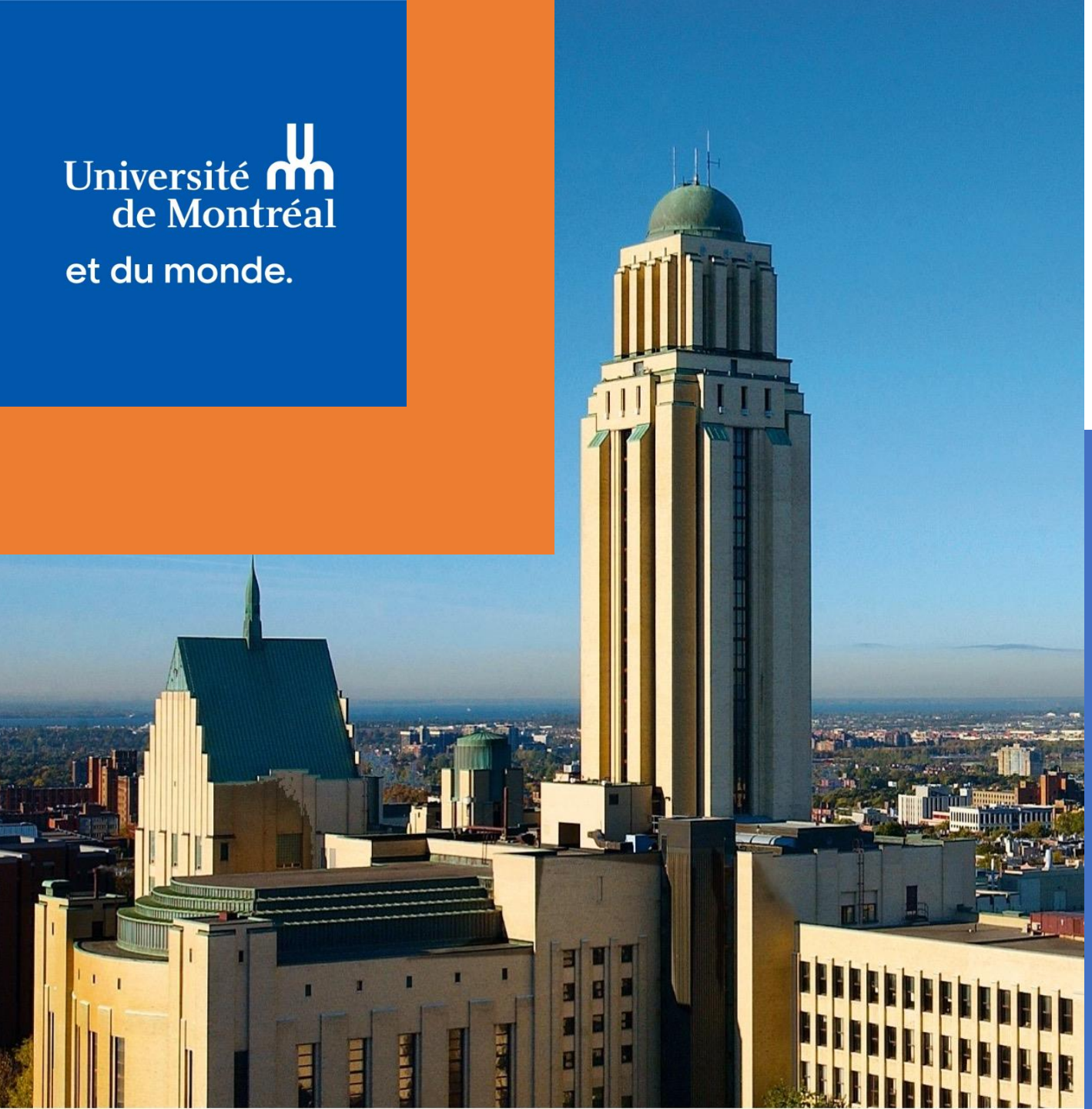

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E-Collab: An Interactive Tool to Explore Collaboration Networks in Digital Health

Kamran Afzali

Digital Health Consortium (Consortium Santé Numérique)

- **Digital Health Consortium** of the University of Montreal created in 2019.
- Brings together the **28 faculties, institutions, and research centers** with an interest in digital health.
- Aims to **propel research and training in digital health**.
- Within the Consortium there is **a team of health data specialists** that support the development and implementation of digital health projects.

Digital Health Consortium: Vision

- Build and deploy a **strategic vision for digital health.**
- Contribute to the **consolidation and mobilization** of digital health **knowledge**.
- Fostering the **agility of health programs** to include digital health.
- Facilitate the **recruitment and integration** of faculty/researchers in digital health.
- Initiate and **facilitate collaborations across disciplines and sectors**, between members and provincial, national and international partners.
- Inform **public policy makers**.

Digital Health Support and Advisory Team (ÉSSN)

A team of **health data specialists** support the implementation of **federative projects** in digital health and ensure the **transfer of knowledge** between the members of the **Digital Health Consortium**.

IVADO

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Digital Health Support and Advisory Team (ÉSSN)

Kamran Afzali
PhD Psychology

Pascale Beliveau
PhD Biomedical engineering

Khedidja Seridi
PhD Computer science

Yves Terrat
PhD Genetics

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Current Project: Aims

Collect

- **Bibliometric dataset** of digital health publications

Analyze

- Analysis of **thematic networks**

Promote

- Promote **collaboration and synergy**

Exploring Thematic Networks: Why?

- Question: **how researchers collaborate?**.
  - The information available from **“files” in each university** is rarely updated.
  - Simple **"word of mouth"**, only identifies affinity groups.

- Principle: an **indicator** of the activity of researchers is **publication and/or presentation** of their scientific work in peer-reviewed journals, conferences or archives.
  - This could be replaced with **alternative indicators** (Altmetrics, pre-prints)

- **Collaboration** has become a common way of **interaction between institutions**

- A **systemic representation** of how academics collaborate is **still lacking**, particularly in an **emerging field like digital health**.

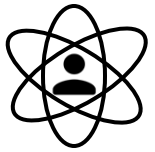
Exploring Thematic Networks: How?

- **Building co-authorship networks** to contextualize the activity of each researcher.
- **Academic collaboration network** : a **visualization technique** to better conceptualize spread of ideas and progress of knowledge domain clusters.
- **A network diagram of relationships between researchers** connected through publications.
- Network community analysis **to identify emerging centers and clusters** and **thematic** related to each.
- Network analysis of **co-publications in the domain of digital health** in Quebec: **an attempt towards understanding collaborative efforts** in the academic ecosystem.

Exploring Thematic Networks: How?

Target audience :

Researchers



Identify experts
Search for co-applicants
Analyze thematic networks

Students

Find a research team
Identify experts

Policy Makers

To orient strategic decisions

Citizens

Identify experts

- **Databases listing peer-reviewed scientific publications**.
- Abstracts are analyzed to **extract keywords**.
- A tool developed in an **open science framework**: all the **databases used are public**.
- **The complete code will be accessible**, modifiable and documented.
- Tool will be deployed using **Compute Canada** servers.

Overview of E-Collab

PubMed
ORCID Connecting Research
Crossref
unpaywall
arXiv.org
OpenAlex
bioRxiv THE PREPRINT SERVER FOR BIOLOGY
medRxiv THE PREPRINT SERVER FOR HEALTH SCIENCES
OSF

Public DBs

Publications DB

DOI	Title	abstract	KW	Year
…	…	…	…	…
…	…	…	…	…

Author	Affiliation	ORCID	KW
…	…	…	…
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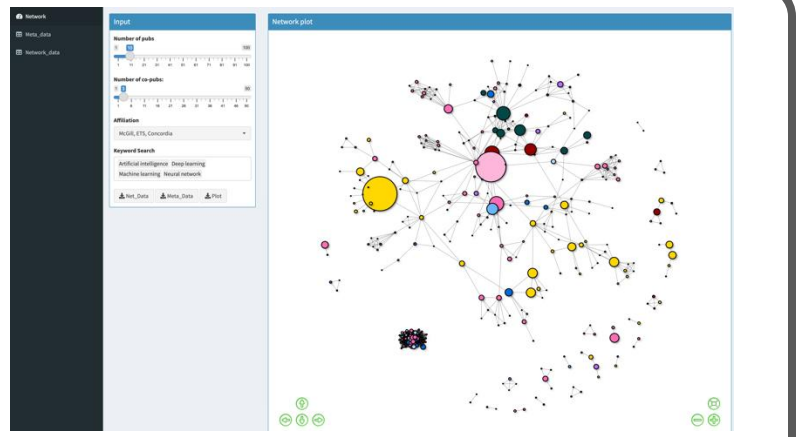
Authors DB

(Artificial intelligence)
AND
(Image segmentation)



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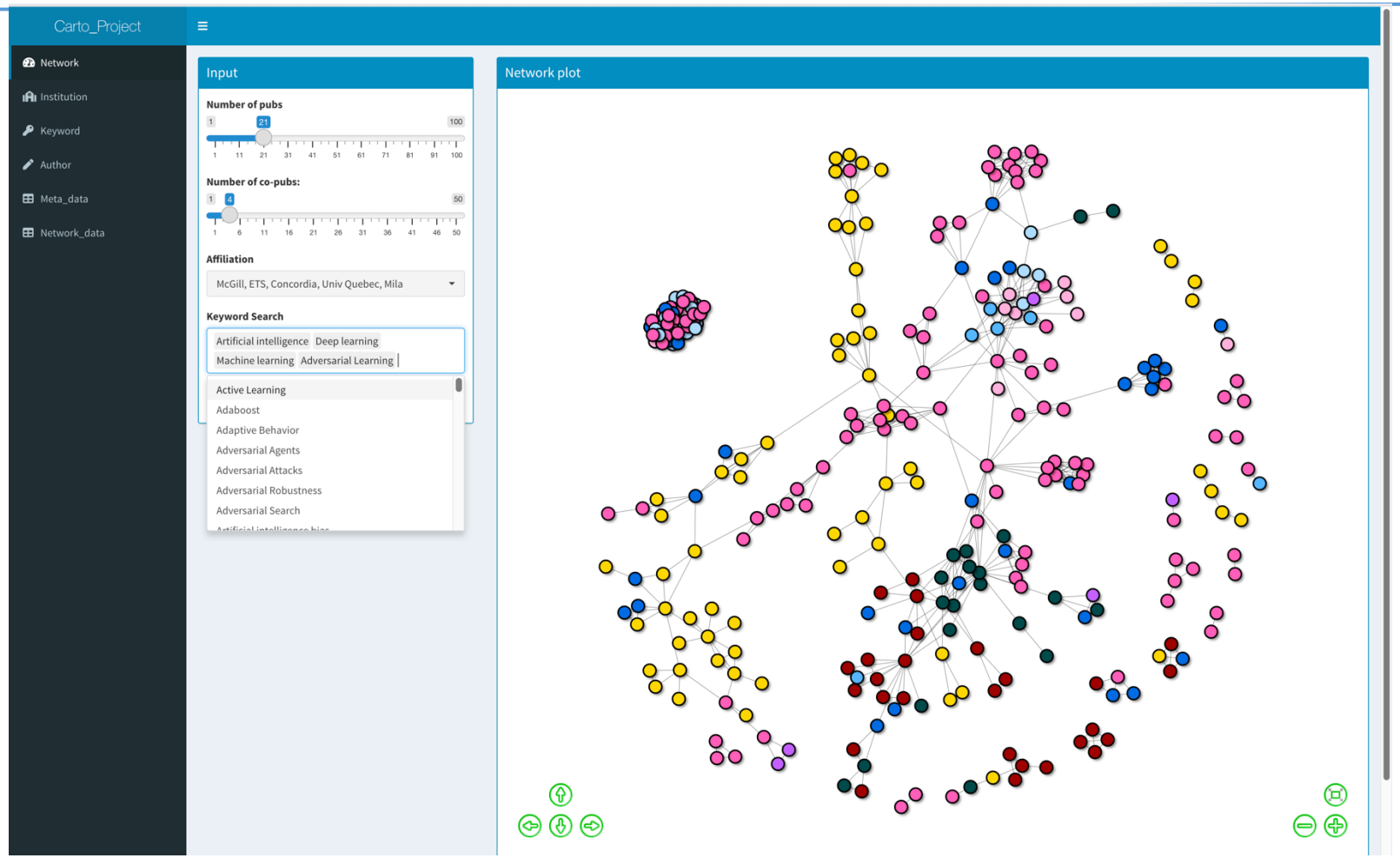
E-Collab: Insights

- Our tool aims to explore the presence of **clusters and structural characteristics of the network** through an analysis at institution and thematic levels.
- **Network visualization** based on the authors number of publications and co-publications.
- **Institutional analysis** based on themes, number of publications, and number of co-publications within each institute.
- **Keyword analysis** with access to related keywords and authors working on similar themes.
- **Author analysis** with access to authors with similar themes or connected through the themes.

E-Collab: Network Visualization



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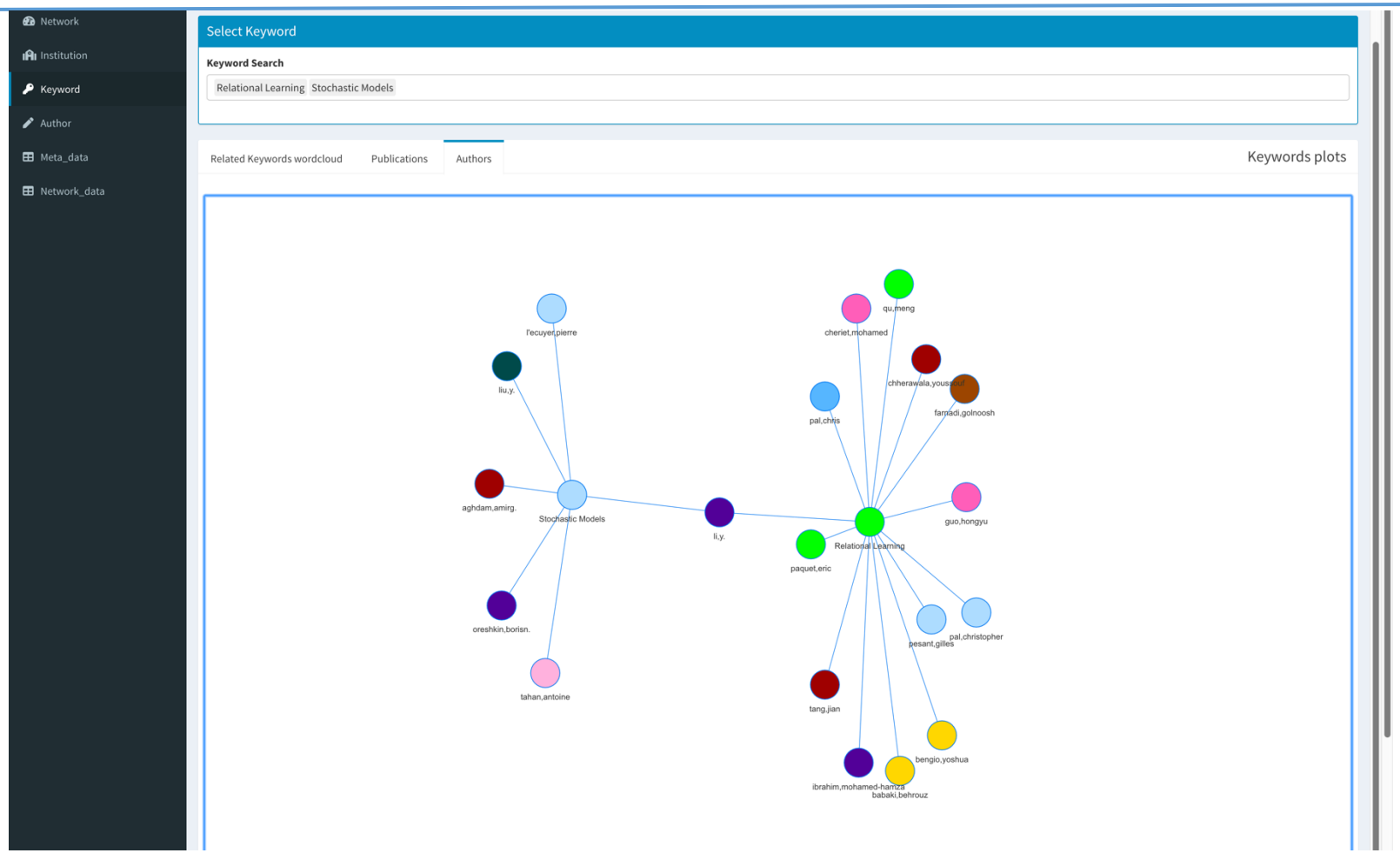
E-Collab: Keyword Analysis



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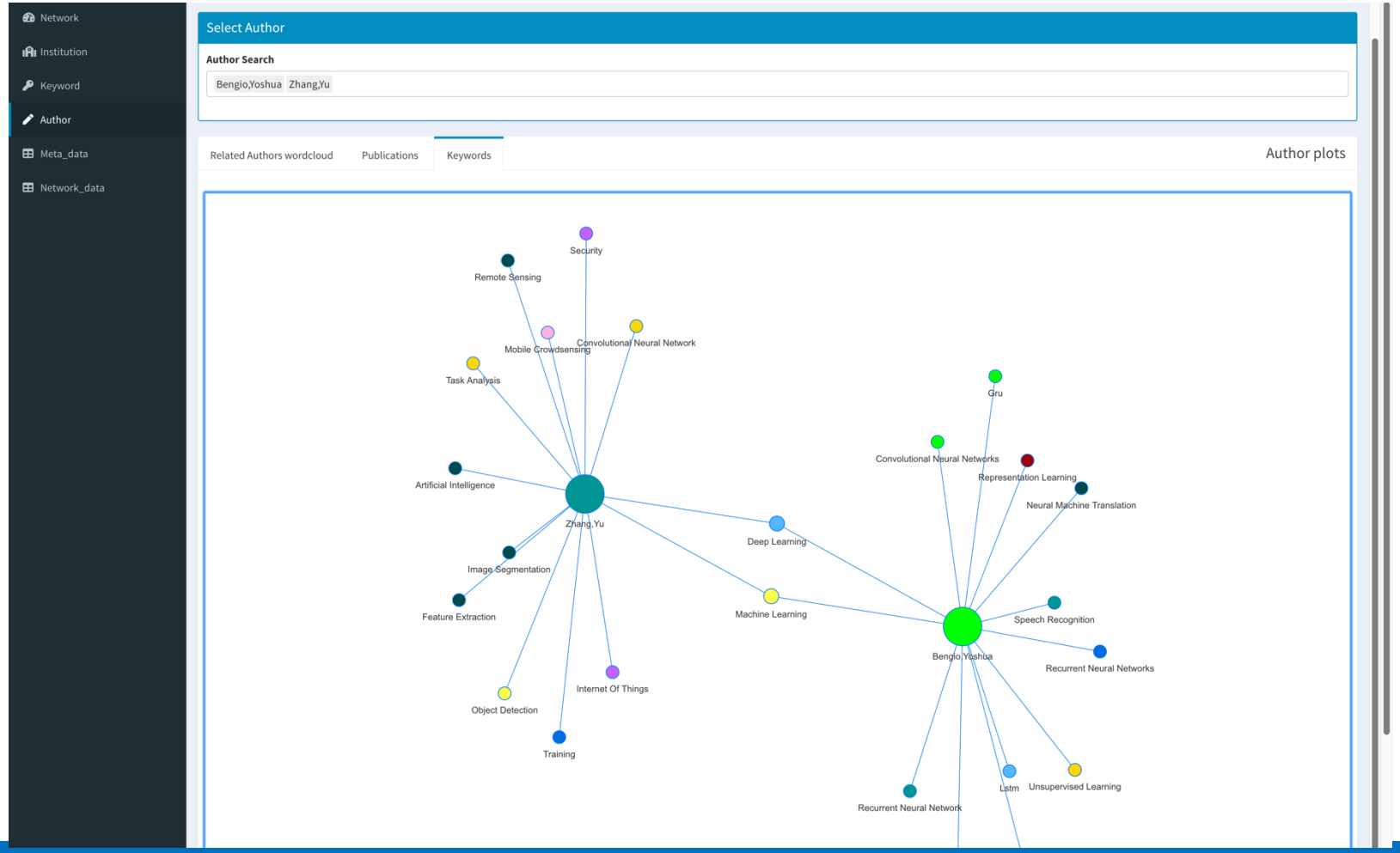
E-Collab: Author Analysis



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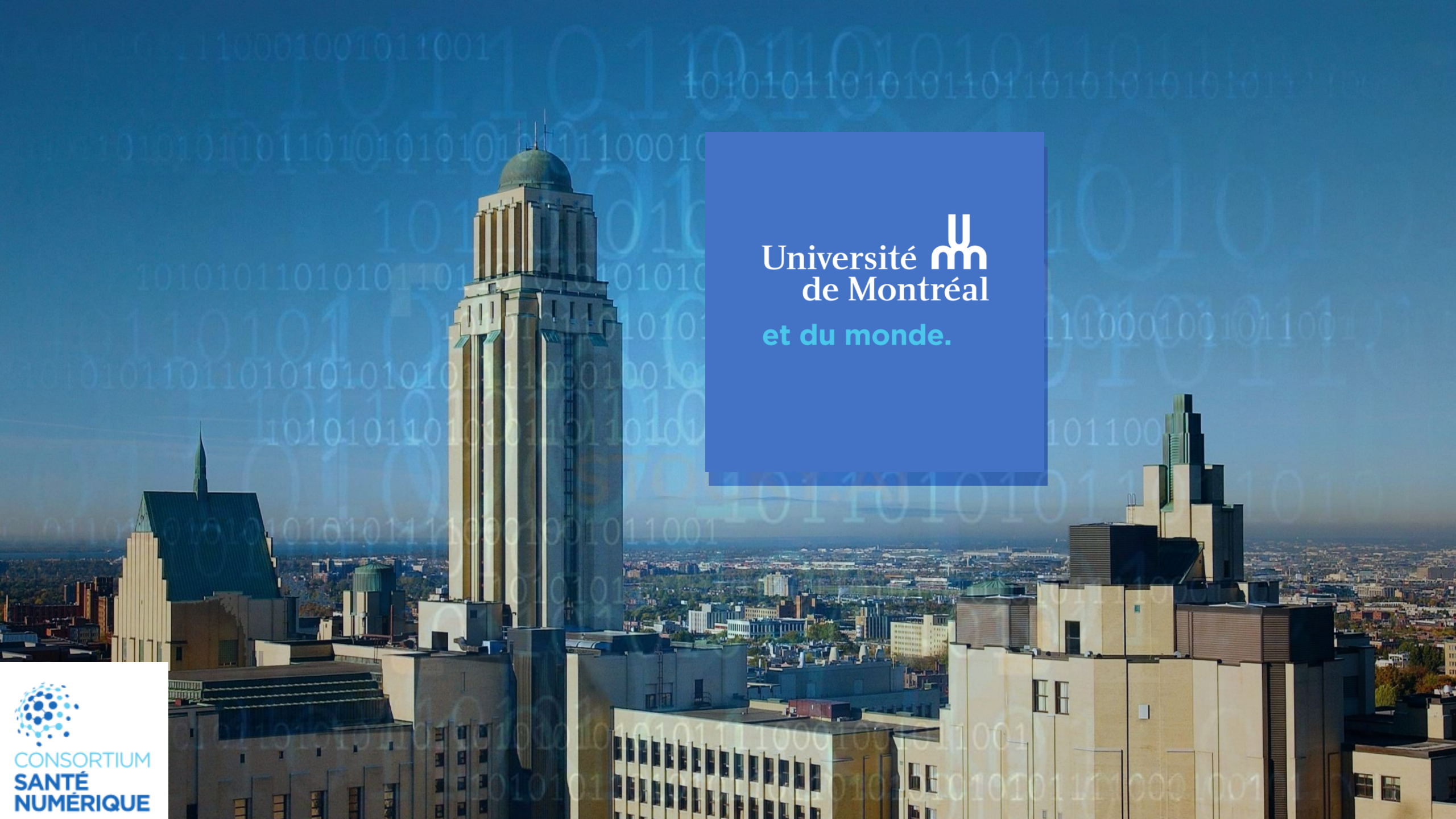
Conclusion

- E-Collab tool presented here inevitably represents only **a first look at the digital health collaboration networks in Quebec**.
- Measures such as **distances and clustering** reflect important aspects of networks.
- Academic collaboration networks will prove a **reliable and copious source of data for creating synergy and collaborative efforts** in the academic ecosystem of Quebec.
- A simple and **intuitive interface** and **additional features** to better understand **authors** and **keywords in thematic networks** distinguish E-collab from similar visualization tools.
- The outcome networks can become the **subject of study, especially by the AI scientists** whom they describe.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