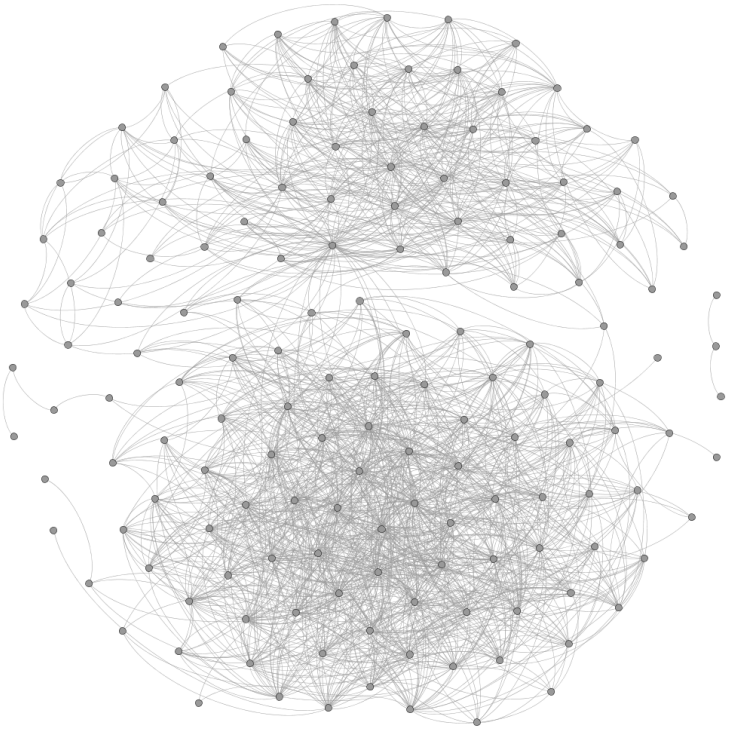

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Webscraping science and science network data

Bas Hofstra

May 2023

Radboud University

Content

Webscraping science and science network data

- Theory *(15 mins)*
  - Science data
  - Networks
  - Sources
  - Tutorial intro
- Tutorial

Science data

Why webscrape science data?

- Science is an inherently social enterprise
  - "Science" == co-evolution of *social aspects* and *production*
    - Social dynamics == collaboration, topic choices, academic job placements
      - I.e., "humans" in science
    - Production dynamics == publication, innovation, grants, patents
      - I.e., "knowledge" in science

Science data

Studied through “science data”

ScienceAdvances

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RESEARCH ARTICLE | NETWORK SCIENCES

Systematic inequality and hierarchy in faculty hiring networks

AARON CLAUSET, SAMUEL ARBESMAN, AND DANIEL B. LARREMORE Authors Info & Affiliations

SCIENCE ADVANCES • 12 Feb 2015 • Vol 1, Issue 1 • DOI: 10.1126/sciadv.1400005

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REVIEW

Science of science

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Letter | Published: 13 February 2019

Large teams develop and small teams disrupt science and technology

Lingfei Wu, Dashun Wang & James A. Evans

Nature **566**, 378–382 (2019) | Cite this article

PNAS

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RESEARCH ARTICLE | SOCIAL SCIENCES

The Diversity–Innovation Paradox in Science

Bas Hofstra, Vivek V. Kulkarni, Sebastian Munoz-Najar Galvez, +2, and Daniel A. McFarland Authors Info & Affiliations

Edited by Peter S. Bearman, Columbia University, New York, NY, and approved March 16, 2020 (received for review September 5, 2019)

April 14, 2020 | 117 (17) 9284-9291 | https://doi.org/10.1073/pnas.1915378117

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Science data

What is science data?

- …all data related to science

Science data

What is science data?

- …all data related to science

ELSEVIER

Research Policy
Volume 51, Issue 1, January 2022, 104411

Gendered knowledge in fields and academic careers

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Received 29 June 2020, Revised 4 October 2021, Accepted 18 October 2021, Available online 2 November 2021, Version of Record 2 November 2021.

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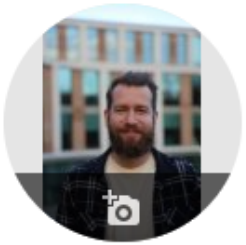

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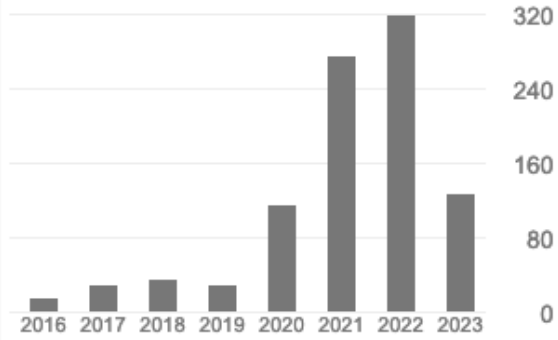

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Vol. 117 | No. 17

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Networks in science data

What are networks in science data?

- Many!

Networks in science data

Co-author networks

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Research Policy

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Gendered knowledge in fields and academic careers

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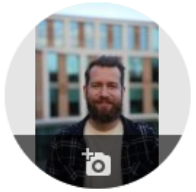

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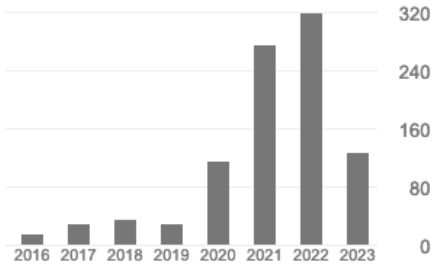

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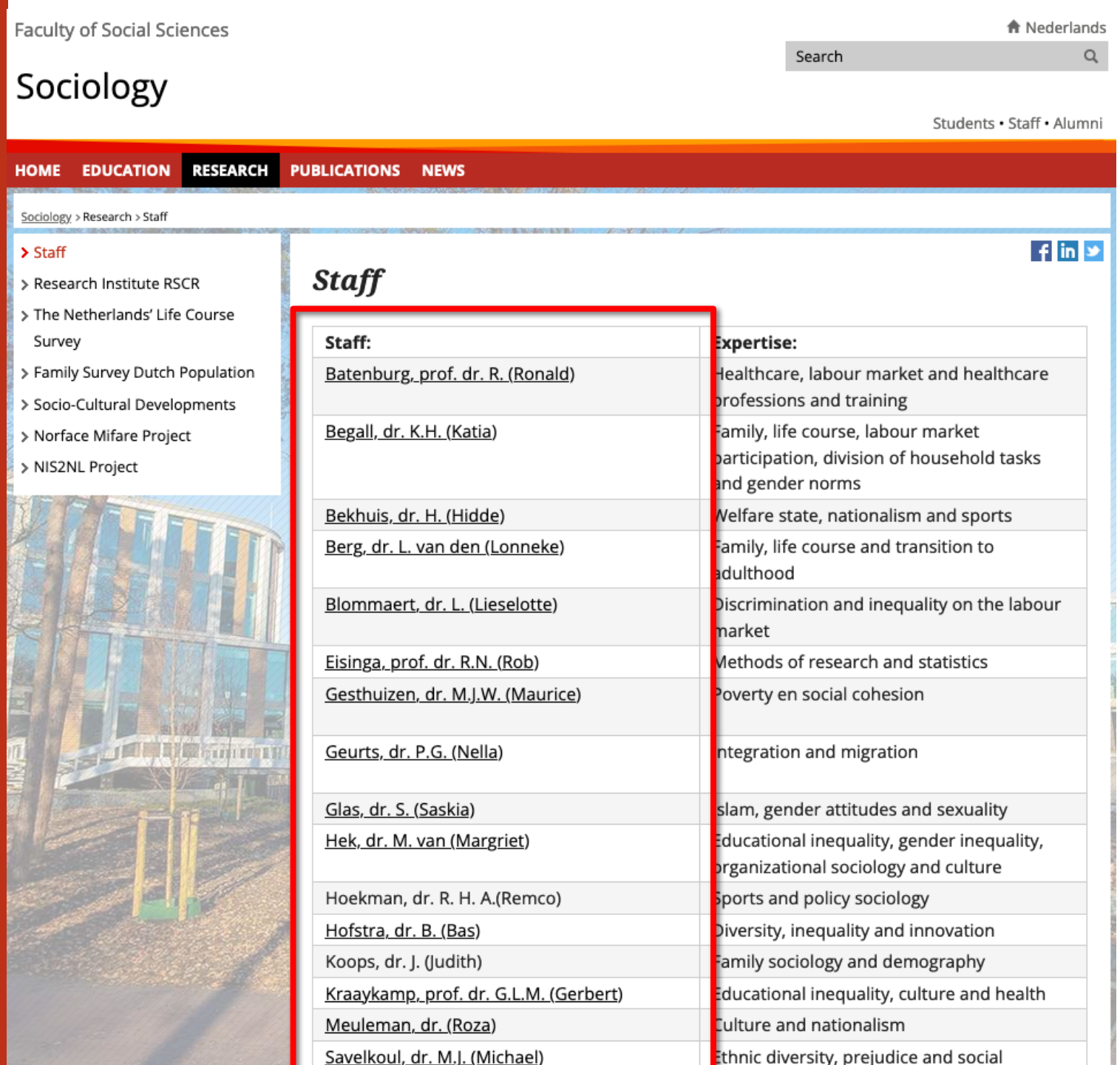

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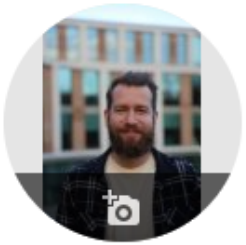

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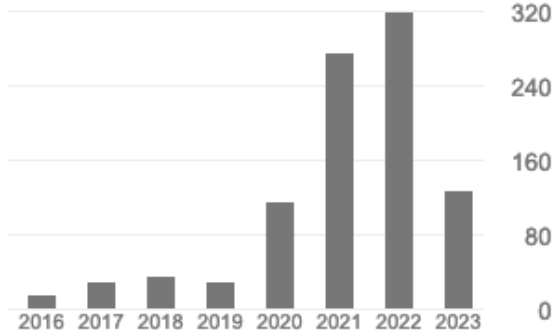

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Networks in science data

What are networks in science data?

- Many:
  - Co-author networks
  - Project networks
  - Faculty hiring networks
  - Migration networks
  - Citation networks
  - Semantic networks
  - And many more

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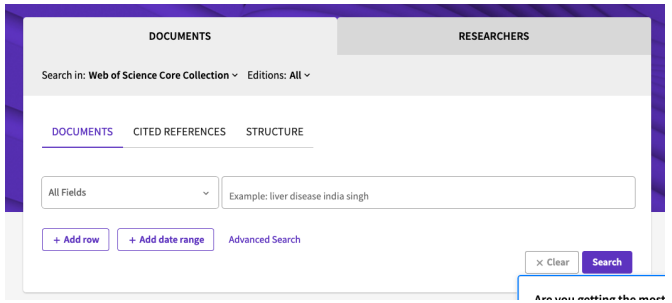

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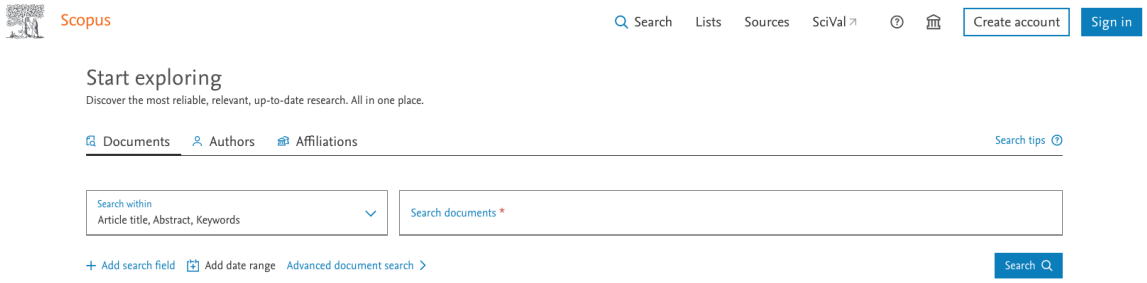

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Tutorial: departments & co-authors

- Which colleagues in academic departments co-author and why?

- Let's built a dataset from scratch to answer this Q!

- What do we need?
  - Departments?
  - Papers?
  - Co-authorships?
  - Matching?