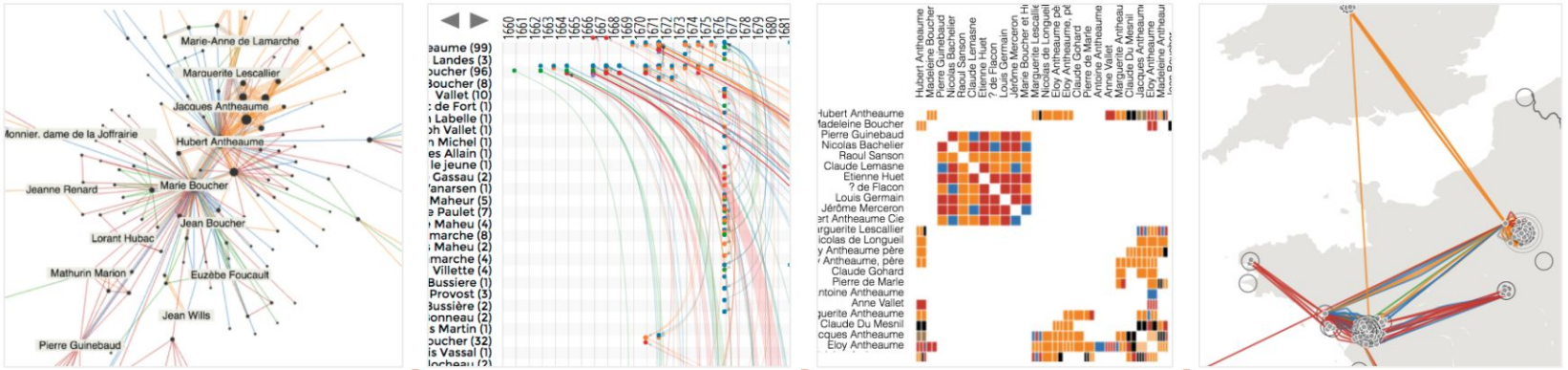
Info Session

5-Weeks Course on Interactive Visual Network Exploration



Friday Dec 10th , 2021
Thursday Dec 16th , 2021

Visual+ Interactive Data

Microsoft Research

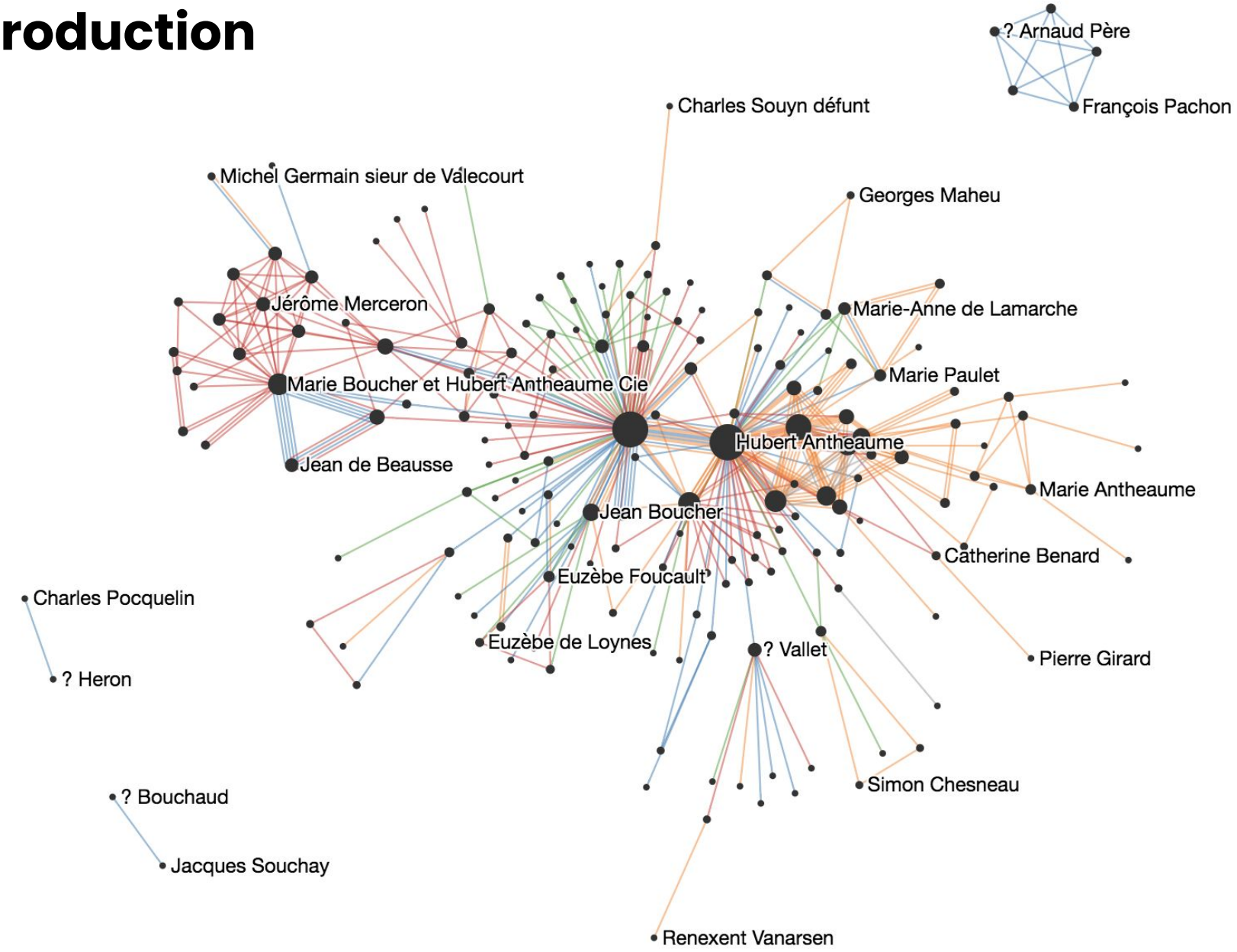
THE UNIVERSITY of EDINBURGH

Info Session Outline

- Network Exploration
- Network Visualization Tools
- Course Outline
- Individual Sessions (Wednesday 3-5 pm UK)
- Questions & Discussion
- *>> put your questions in the chat*

Network Exploration

Introduction



What is network exploration?

- Exploratory Data Analysis (EDA), 1970s
- Visualizations for exploration
- Multiple views / perspective
- Interactive iterative interrogation
- Hypotheses generation
- Informing analysis, cleaning
- Curiosity
- > not pure analysis
- > not visualization for communication

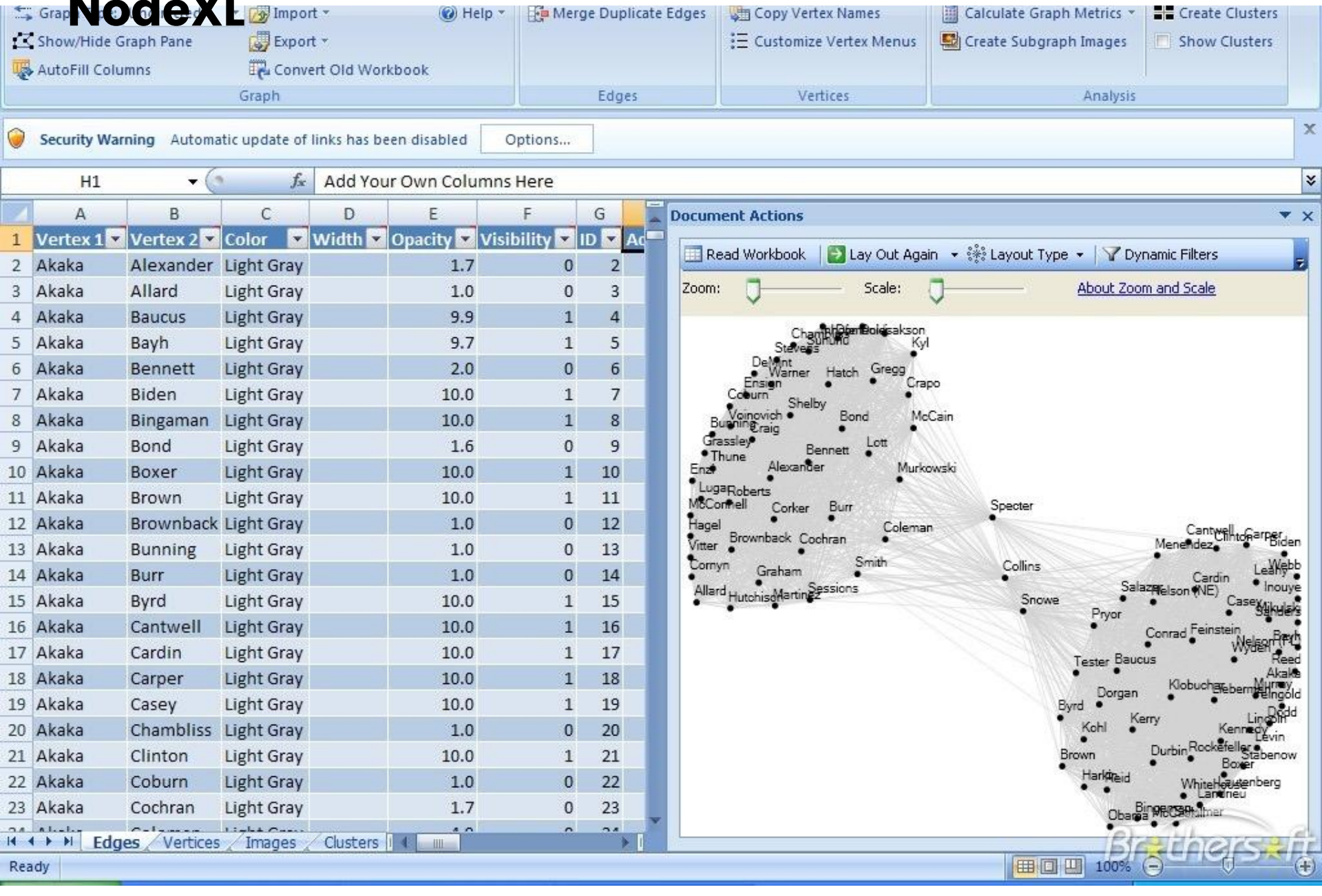
Steps in Exploration

- data collection
- **data formatting / shaping,** *making data machine readable*
- **data cleaning** *duplication, time formats*
- **define a network,** *what are my nodes and links?*
- **visualization for exploration**
- quantitative data analysis

Network Visualization Tools

https://nodexl.codeplex.com

NodeXL



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16	Akaka	Cantwell	Light Gray		10.0	1	16
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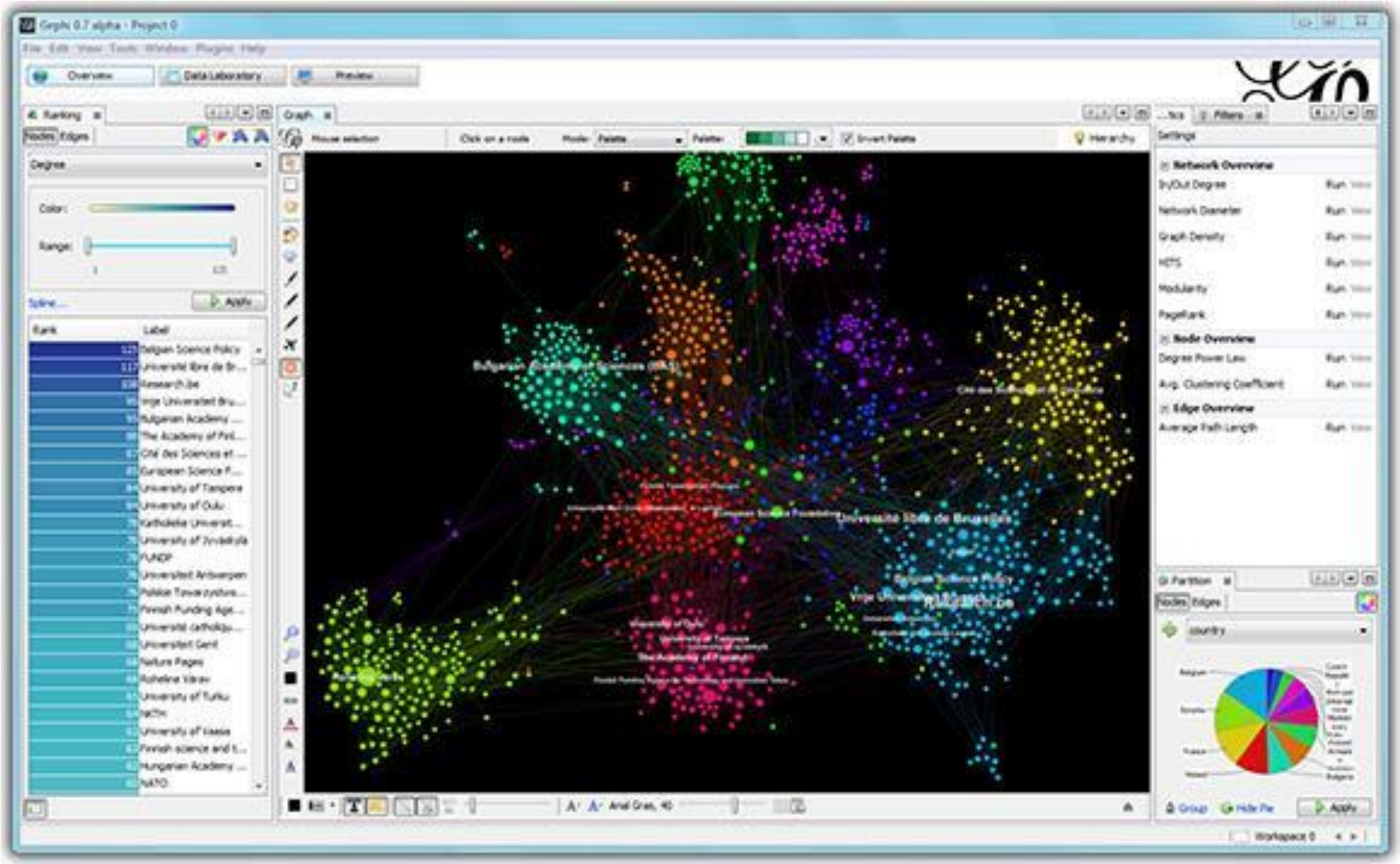
Gephi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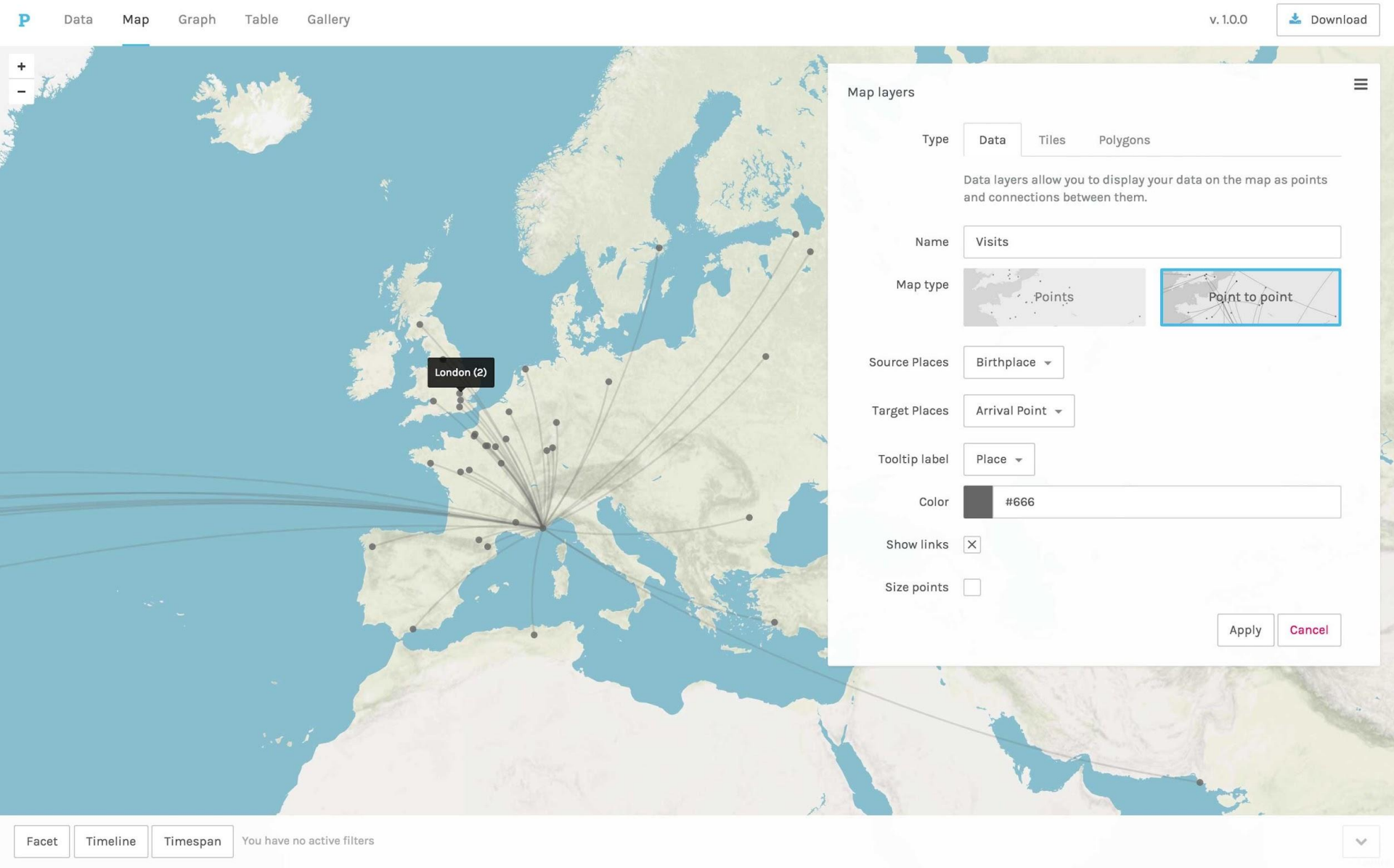
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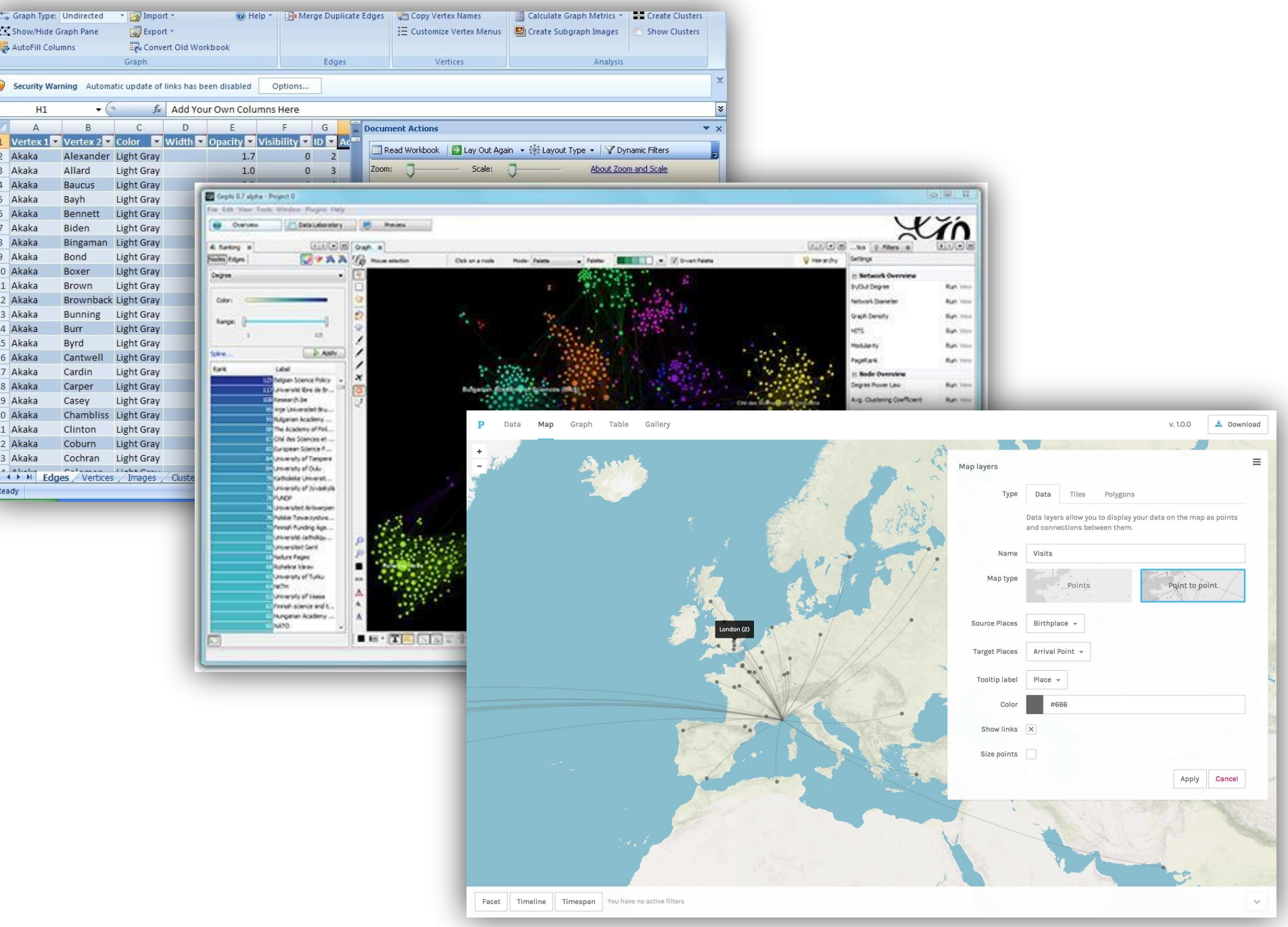
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London (2)
Map layers
Type
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Polygons
Data layers allow you to display your data on the map as points and connections between them.
Name
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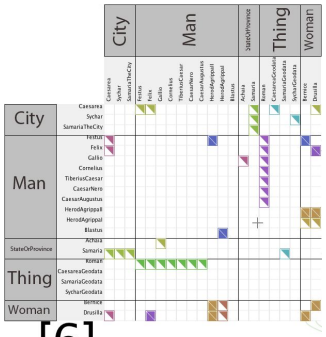
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Drusilla

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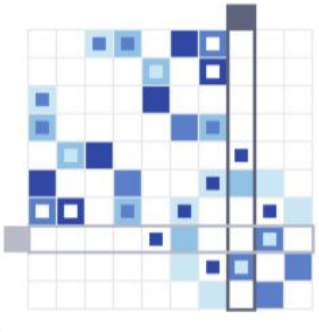
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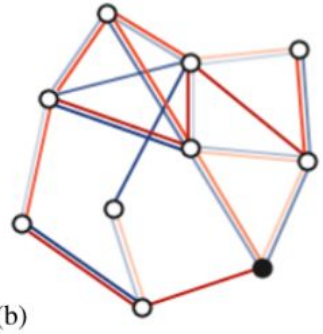
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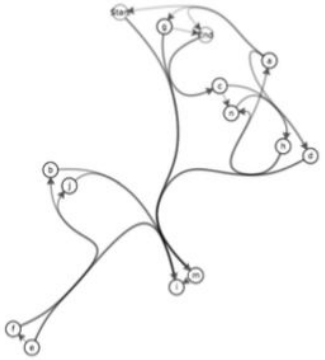

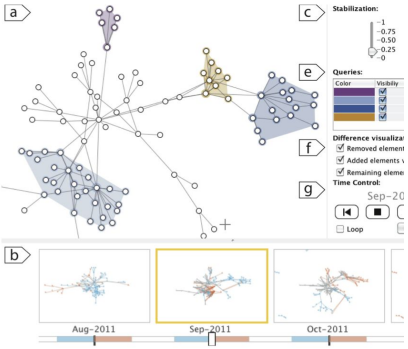
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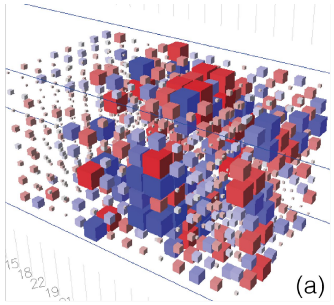
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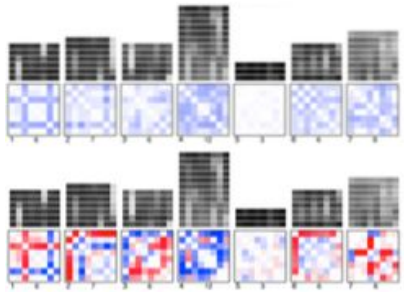

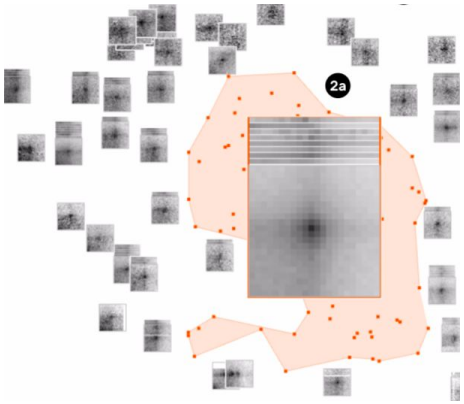
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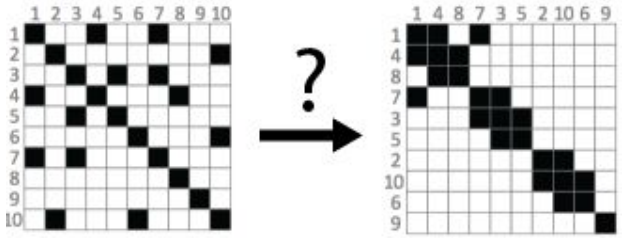
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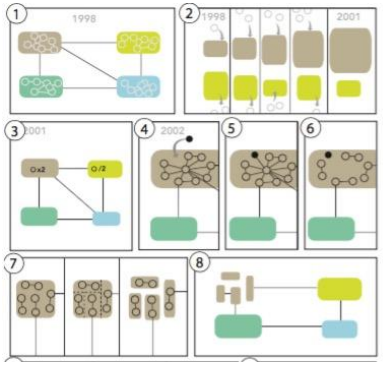
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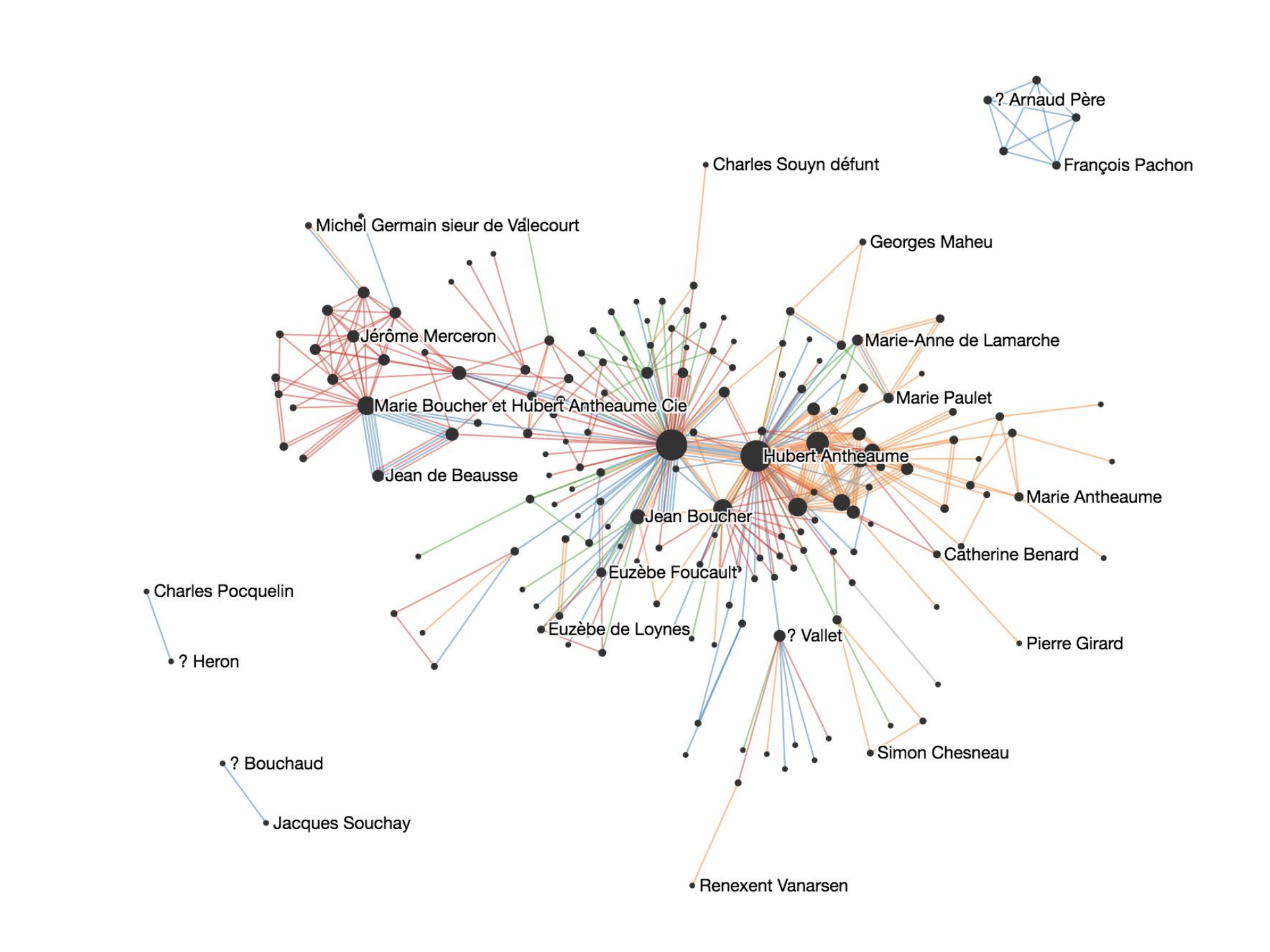
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Charles Souyn défunt
Michel Germain sieur de Válecourt
Georges Maheu
Jérôme Merceron
Marie-Anne de Lamarche
Marie Boucher et Hubert Antheaume Cie
Marie Paulet
Hubert Antheaume
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Pierre Girard
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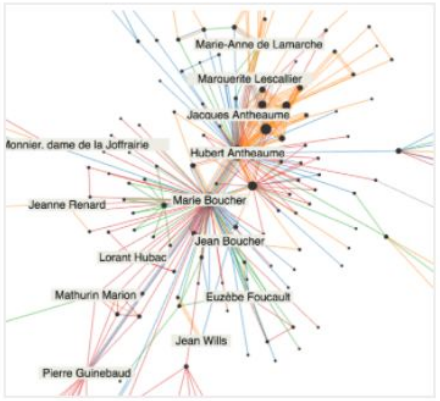
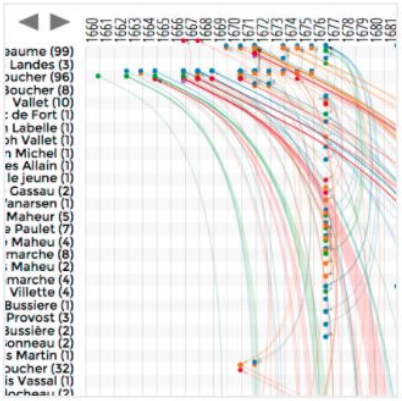
Simon Chesneau
? Bouchaud
Jacques Souchay
Renexent Vanarsen

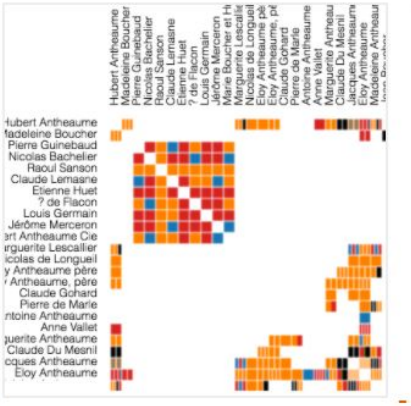
The Vistorian (beta)

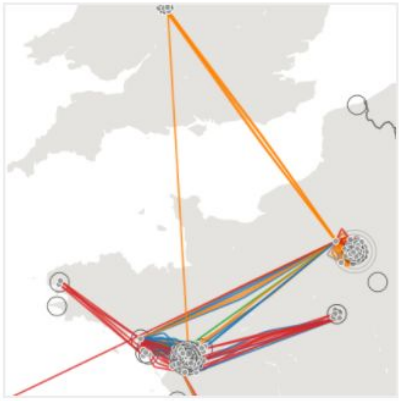
Interactive Visualizations for Dynamic and Multivariate Networks.

Free, online, and open source.



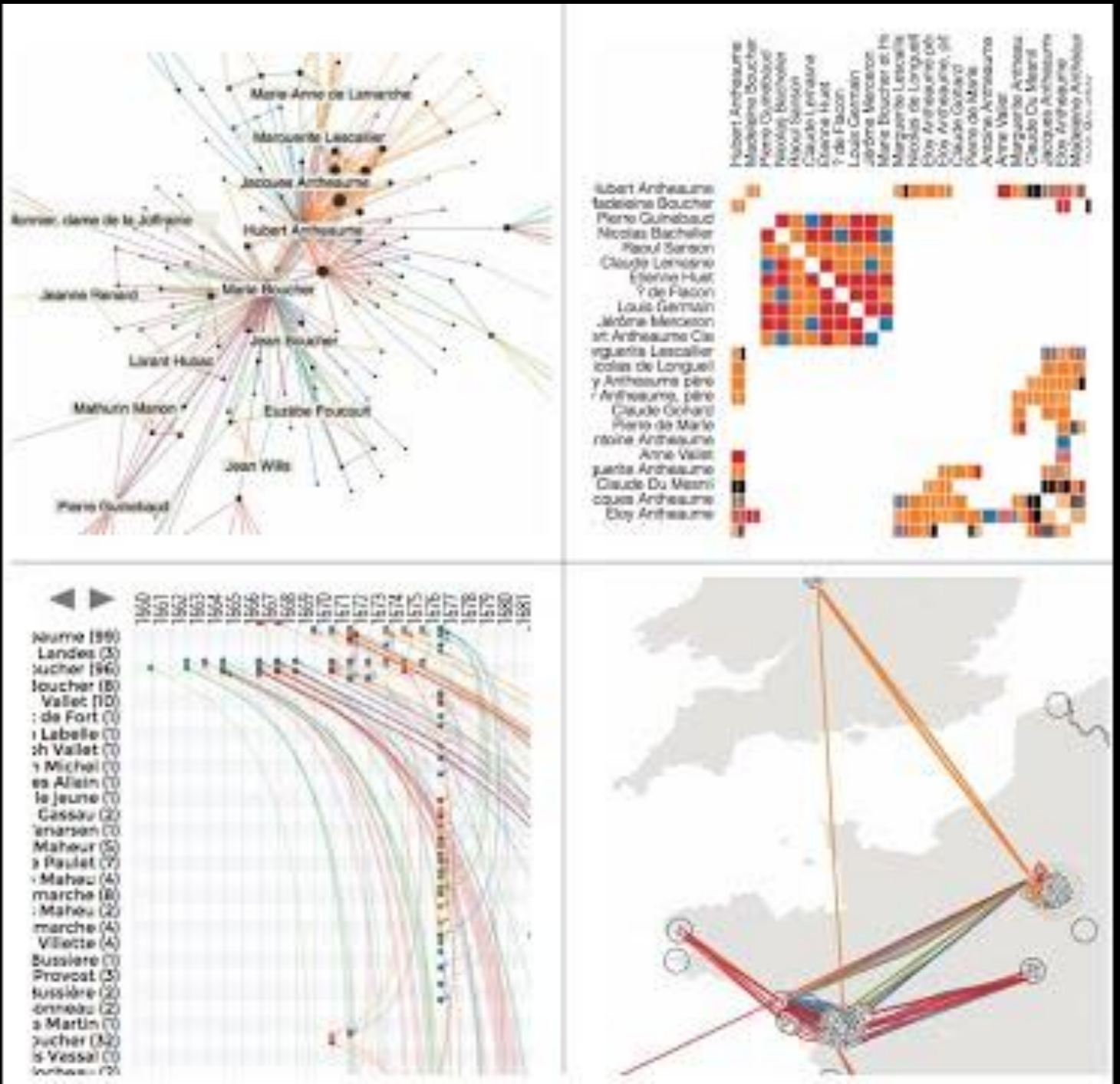






Visualizations Example Session Your Session

Manual Github Contact


Marie Anne de Lamarche
Marguerite Lescallier
Jacques Antheaume
Hubert Antheaume
Marie Boucher
Jeanne Renard
Jean Boucher
Lisant Hubac
Mathurin Marion
Eustache Foucault
Jean Wills
Pierre Guinebaud
Hubert Antheaume
Madeleine Boucher
Pierre Guinebaud
Nicolas Bachelier
Raoul Samson
Claude Lemoine
Etienne Huet
Louis Germain
Jérôme Merceron
Marie Boucher et Hu
Marguerite Lescalle
Nicolas de Longueil
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Pierre de Marle
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Common Questions on Network Visualization

- What type of file format should I use for my data?
- How can I format my data to visualize as a network?
- How can I decide what to use: node table or link table?
- What is the best visualization type to explore my network?
- How to read a network visualization?

Course Overview

Course Goals

During the course, you will learn to

1. **Structure your network data and prepare it** for visualization with the Vistorian.
2. **Define goals of your exploration** and what you aim to learn about your network data using visualizations.
3. **Know a range of network visualizations**, through theory and hands-on use.
4. **Use different types of interactive visualizations** to explore your data.

Intended Audience

- People with network data
- People who are in the process of collecting network data
- Everyone at an early or later stage in their analysis

- *No need to have data properly formatted.*
- *No need to have data already.*

Course Prerequisites and Requirements

- **No technical or programming skills** are required.
- **No pre-knowledge in network analysis of terminology** is required.
- No need to install any software.

Dataset selected for Hands-on Activities

- Ideally, **participants to be working with their own network data during the course**.
  - If you do not have your own dataset, we can provide you with demo data.
- Your data should **not be too large as any visualization of large data sets** is challenging in itself.
  - An ideal size for the course is up to *500 links in your network*.
- To know more about the data types and features a network might contain, please check the course webpage http://vistorian.net/courses

Key Information

- The course is **free of charge** and open to everybody.
- We have a *limited number of 20 places*.
- The course includes **a 2-hour session on Wednesday of each week and for 5 weeks** (**Jan 12-Feb 9**, 2022) and ***may require potentially more time at home*** *to prepare and work with your data*
- The *course combines*:
  - brief lectures,
  - hands-on activities,
  - discussions,
  - individual support (drop-in sessions TBA)

Sessions by Week

Network Data Preparation

Week 1 - 12th Jan 2022

- Role of Visualizations in Network Exploration
- A set of hands-on exercises to help you define potential network relations in your data and your research questions:
  - What is your network about?
  - What is your network's data model?
  - How can you format your network data?
  - Working with tables (bring your own data)
  - How to choose your exploration variables?

Data Shaping Techniques and Challenges

Week 2 - 19th Jan 2022

- Data types in your network
- Ensuring consistency of your data
- Tools to assist in checking data consistency
- Common challenges in network visualizations:
  - What if my network is too large to visualize?
  - What if my data contains semi/unstructured data?
- Techniques in preparing your data
- Preparing your exploration plan

Node-Link Diagrams

Week 3 - 26th Jan 2022

- Reading topological structures in node-link diagrams
- Exploring the temporal evolution of your network,
- Encoding additional attributes through
  - Multiple links
  - Weighted links
  - Directional links
  - Link and node types

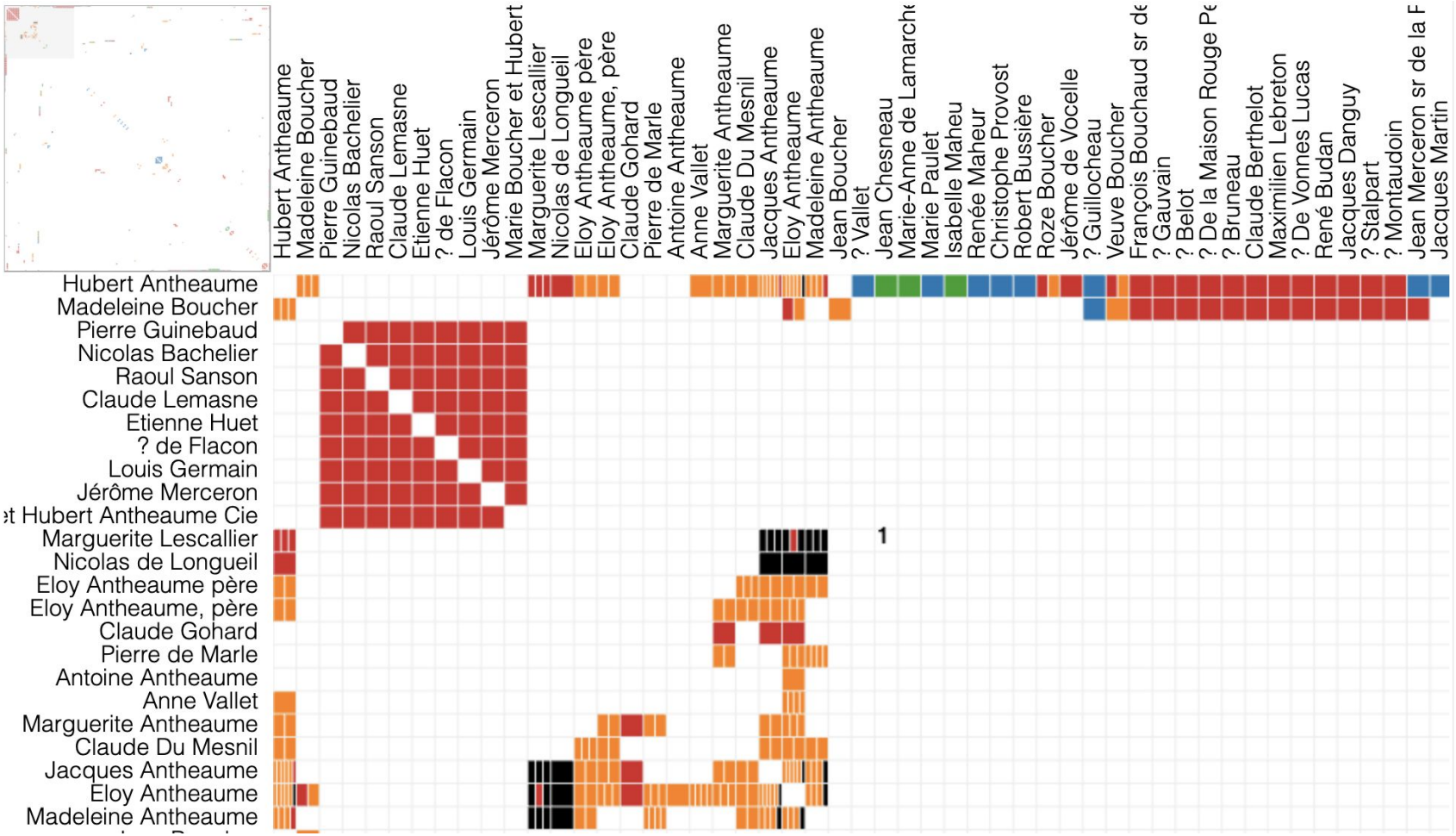
Adjacency Matrices

Week 4 - 2nd Feb 2022

- Reading network structures from an adjacency matrix
  - Temporal evolution of your network
  - Multiple links
  - Weighted links
  - Directional links
  - Link and node types.
- We will also explain matrix ordering algorithms that help you reveal clusters and highly-connected nodes.

Adjacency Matrices

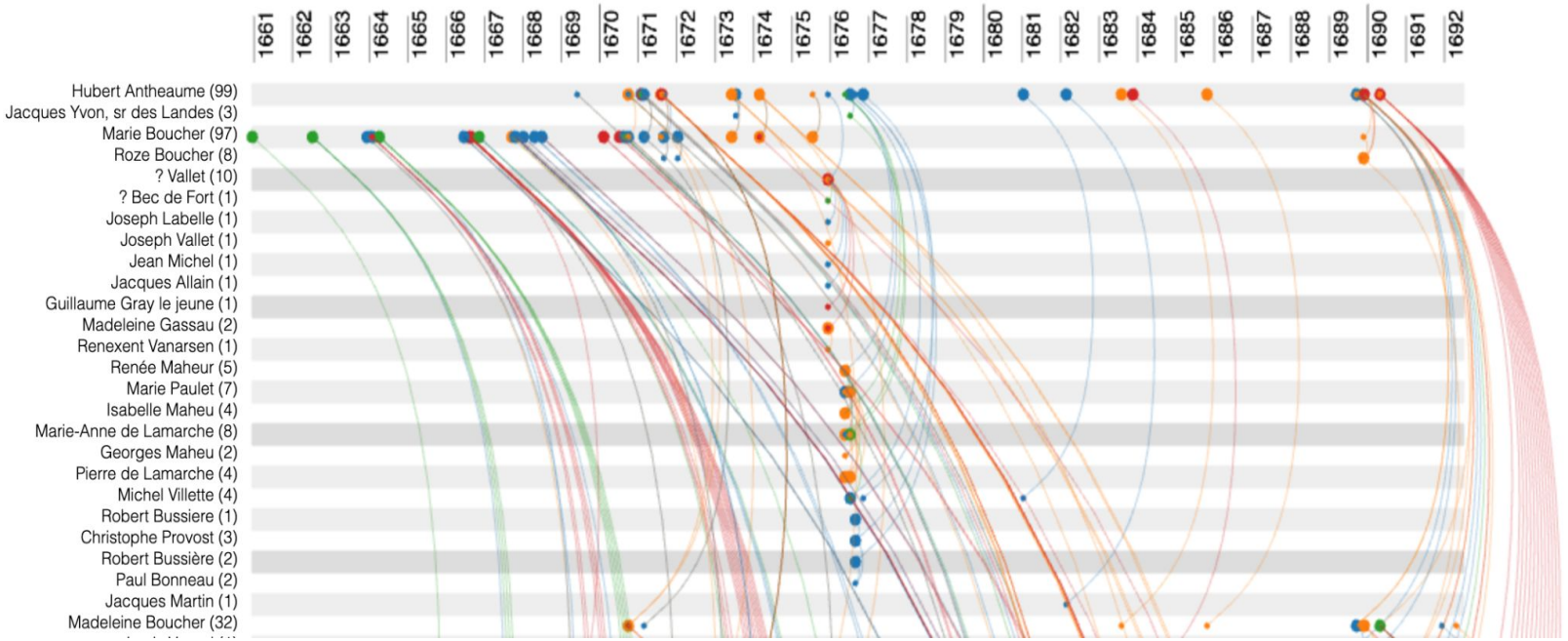
Week 4 - 2nd Feb 2022



Timeline, Map, and Multiple Views

Week 5 - 9th Feb 2022

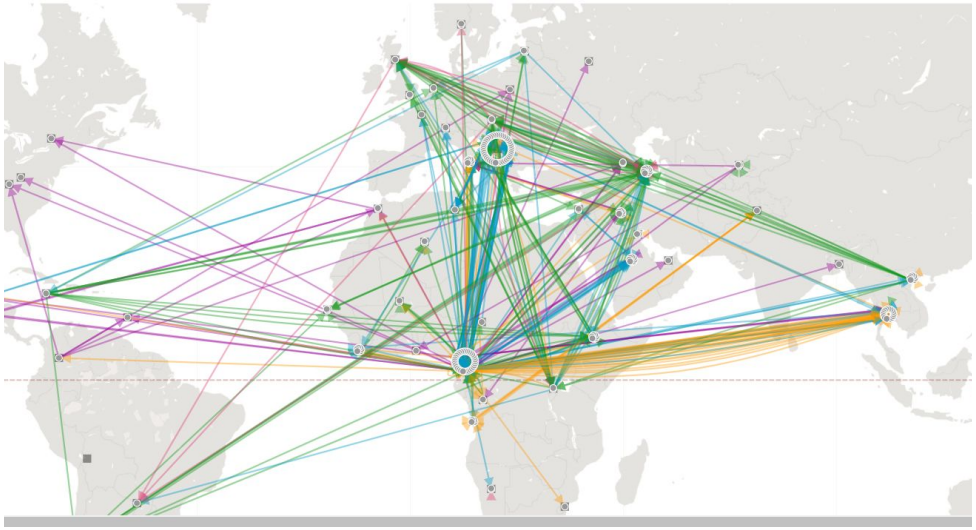
- **Timeline visualization**
  - How to read time arcs?
  - Visual encodings
  - Ordering and temporal changes



Timeline, Map, and Multiple Views

Week 5 - 9th Feb 2022

- **Map visualization:**
  - What is geographical data?
  - When and why to use a map?
- **Interactions** and **Multiple Views**:
  - How can multiple views support your analysis
  - Static views vs. Interactive views



Registration

- The registration link : https://forms.office.com/r/qAnvASgRyJ

- will take you to a form which will take between 5-15 mins to complete

- By registering to the course you:
  - must consent to the ethics form provided in the registration form.
  - plan to attend to all 5 sessions.
  - ensure that you have read all of the key information mentioned above

Ethics & Data Collection

- This course is part of a research project which was approved by the Ethics Board of the School of Informatics *Approval #2019/67905*
- All approved ethics-related documents can be found at: http://vistorian.net/courses including:
  - Participant Information Sheet
  - Participant Consent Form
- All information collected about you will be kept strictly confidential. All data will be anonymized.
- Your data will be processed in accordance with Data Protection Law.

Questions & Contact

- Course ***Webpage*** *(check for updates)*:

  http://vistorian.net/courses

- Course **Registration Link**:

  https://forms.office.com/r/qAnvASgRyJ

- ***The Vistorian*** Website can be launched through

  http://vistorian.net/ homepage.

- For any enquiries reach us on ***Slack Channel*** or ***email***

  m.alkadi@sms.ed.ac.uk