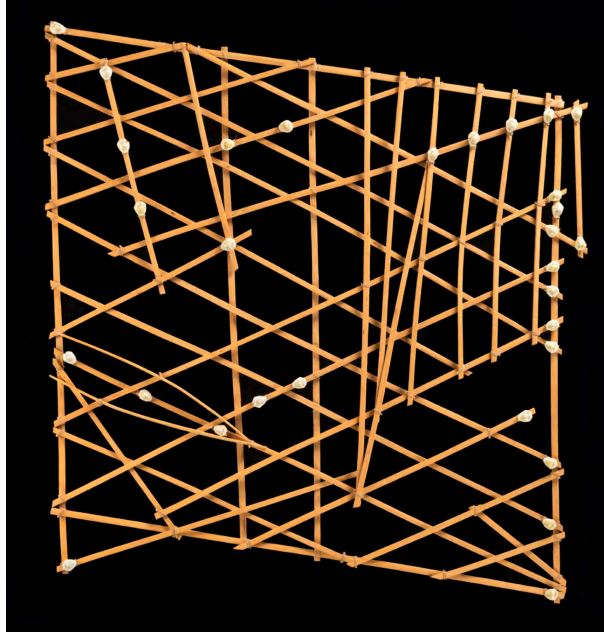


# MO5161 Skills in Digital History: Maps and Text

Module Coordinator: Konrad M. Lawson

Fall, 2023



**Marshallese Navigational Chart**

Denver Museum of Nature & Science Catalog No.: A926.1

**Repository for this handbook available at:**

<https://github.com/kmlawson/skills-in-transnational-history>

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## Overview

**Meetings:** Tuesday 15:00-17:00

**Location:** St Katharine's Lodge 0.01

**Preparation:** ~20 hours per week

Week 1 - **Orientation and Introduction to Historical GIS**

Week 2 - **QGIS: Basics and Georeferencing Historical Maps**

Week 3 - **QGIS: Techniques for Exploration and Analysis of Spatial Data**

Week 4 - **Thinking With/Against Maps and Spatial Analysis**

Week 5 - **Using the Command Line and Regular Expressions**

Week 6 - *Independent Learning Week*

Week 7 - **An Introduction to Large Language Models**

Week 8 - **An Introduction to R**

Week 9 - **Using R: Frequencies, Correlations, and Sentiment Analysis**

Week 10 - **Surveying the Text Analysis Landscape**

Week 11 - **Networks: Introduction to Social Network Analysis**

## Key Info

**Coordinator:** Konrad M. Lawson **Email:** [kml8@st-andrews.ac.uk](mailto:kml8@st-andrews.ac.uk)

**Meetings:** Thursdays 3-5pm St Katharine's Lodge 0.01

**Office:** St. Katharine's Lodge Room B3

**Office Hours:** Thursday 9-10 on Teams. [Sign up for a time](#)

## Description

This digital humanities module provides students with an introduction to digital mapping in the form of historical GIS (HGIS) and computational approaches to the analysis of text. No specific technical knowledge is required before taking the course. Students will gain proficiency in the use of the software package QGIS to digitise historical maps, visualise and analyse geographical information, and produce rich maps for the illustration and heuristic exploration of historical information. In order to analyse large bodies of digitised text, students will learn regular expressions and become familiar with a range of text analysis techniques such as named-entity extraction, frequency and sentiment analysis, topic modeling, classification of texts, and explore the new world of large language models. Finally, students will engage with scholarship in the critical digital humanities in order to critically evaluate the challenges and shortcomings of some of these methodologies.

## Assessment Summary

25% Exercises 1 6 October 23:59

25% Exercises 2 13 November 23:59

50% Project or Essay 8 December 23:59

## Assessments

You have two shorter assessments that are worth 25% each, referred to as Exercises 1 and Exercises 2. The remaining half of your mark for this module is determined by a final project or essay, worth 50%.

### Exercises 1 and 2

Each of these two submissions are worth 25% each of your mark.

For the submission of Exercises 1, you may choose between (1) Five GIS tasks or (3) Short Essay below.

For the submission of Exercises 2, you may choose between (1) Five GIS tasks or (2) Five Text Analysis tasks or (3) Short Essay.

- (1) GIS Tasks - See separate handout distributed in the early weeks of the semester. Choose 5 of the 10 tasks for your submission. If you choose this assessment twice, do the remaining five tasks for your second submission.
- (2) Text Analysis Tasks - See separate handout. Choose 5 of the 10 tasks for your submission.
- (3) Short Essay 2,000 words. If you choose this twice, you will need to do it on a different work/resource. For this tasks, write a short essay that evaluates and critically engages with either a) a piece of scholarship which applies historical GIS methods or other computational approaches (text analysis, social network analysis) to a historical issue or b) an online database or digital project of use to historians.

### Final Project or Essay

Your final project should be an opportunity for you to build a more substantive submission for the module. While the deadline is not until late in the semester, you should ideally be working on this project, or building up your skills in preparation for this project, throughout the semester. If you select the essay, you should spend significant time during the semester expanding your reading in the area most relevant to your essay.

You may submit one of the following options:

#### Option One: Map Project

This assessment is designed to give you a chance to demonstrate your ability to effectively use QGIS to prepare map layers, produce exported maps for incorporation into a historical project; be able to articulate what the maps can be useful for; and be able to describe the limitations and problems associated with your map and the data on which it depends. For Submission you must upload, as a zipped collection of files, to the MMS:

1. 1,500 word explanatory essay which provides some basic historical background to the inspiration for the map project, discusses the ways in which the map can be used for heuristic, illustrative, or analytical purposes, and the limitations and problems with map. In other words, discuss both what the map might reveal, but also what it may potentially conceal or distort. *Important:* At the end of the essay or embedded into the body of the essay should be the exported maps, with any post-processing required, such as you would want them to appear in a historical essay, with an appropriate caption. You will be marked in part on the presentation quality of the map and its ability to clearly and cleanly communicate what it sets out to show.
2. An appendix, at least 500 words must also be uploaded to the MMS which describes the technical process by which you assembled the QGIS project and its layers. What did you do to create each of the layers? Where exactly did you get the data for each of the layers and why did you choose that data over possible alternatives? What other technical steps did you carry out in order to produce the project?
3. If your files cannot, for some reason be uploaded directly to MMS as a zip file, you may instead upload a single page document with a link to a place where the QGIS files can be downloaded (publicly accessible or shared Google Drive or Dropbox file link, or other file sharing resource). If you choose to use this method, in order to ensure that no further modifications to the documents are made after submission, your document with the link must include the "checksum" or MD5 hash for the zipped collection of documents (you can do this via the command line or online at a site such as this one: <http://onlinemd5.com/>). Alternatively, you may submit a USB drive on the previous meeting of class with the files.

**Scope:** The number of layers of data, the number of visualisations produced, and the quantity of data to include depends entirely on what map or maps are being created, that is what you are trying to show. It may consist of three or up to a dozen layers and may include natural coastal or topographical data, other features, and thematic data layers visualizing things. You may generate a single exported map if it is rich and complex (but not to the detriment of its ability to communicate), requiring a very significant amount of time in preparation or a collection of different maps using different data or snapshots of data at a particular time if they can be used effectively for historical argumentation. You may combine maps with tables or graphs, or maps combined with presentation of spatial analysis. Think of your project as building a portfolio to pitch your work at a workshop, in a grant application, etc. showing a good balance of analysis, design skills, and judicious choice in what to include and exclude. If you are concerned about finding the balance, feel free to consult with the tutor as your potential outputs become clearer.

*Considerations for Assessment:*

- Context: Did the project explanatory essay set the context sufficiently?
- Analysis: Did the project explanatory essay effectively explore the limitations and advantages of the maps produced or spatial analysis performed?
- Combination: Did the chosen combination of a) the number of maps produced b) the challenge of compiling the spatial data for visualisation c) the challenge of specific techniques employed in the creation of the visualisations d) the employment of any specific spatial analysis e) any alternative ways of visualising the data (tables, graphs, as appropriate) represent an effective and judicious balance for the presented project portfolio?
- Appendix: Did the appendix effectively describe the process of creating the visualisations and any spatial analysis performed and did it properly cite the sources for the data.
- Design: Did any visualisations or maps produced clearly communicate their contents and demonstrate a good sense of design, well-chosen scales, and appropriate density of visual information?
- Restraint: Did the project avoid superfluous visualisations that contribute little to the overall project and show good judgement in what to include and exclude?

**Option Two: Text Analysis Project (50%)**

You may do a project which makes use of one or more of the new computational techniques learned in the second half of the course: text analysis. You are free to use the combination of tools and techniques that you feel most appropriate and comfortable in using (R, Python, Cytoscape, Voyant Tools, regular expressions and command line utilities etc.). You are also welcome to teach yourself and make use of other techniques and tools that you have come across if these are well documented and described in your project. For example: students who are interested in social network analysis are also welcome to use some of the resources linked in the module handbook and submit a project which makes use of these methods.

Your project should include from one to a dozen visualisations depending on the difficulty and complexity of the visualisations produced and what they can potentially be used for.

These may include any of the following: 1) a collection of graphs and tables identifying patterns in the data or the product of computational analysis of text or networks. 2) Visualisation of the text or social network data in combination with GIS in the form of a choropleth or other thematic map which visualise networks or material extracted from a text or corpus of texts. 3) a list of regular expressions, including description of what they do, that were used to clean data or extract useful material from texts.

For Submission you must upload to the MMS:

1. 1,500 word explanatory essay which provides some basic historical background to the inspiration for the project and visualisations. It must also discuss the limitations, assumptions, and advantages of the material produced, including its heuristic, illustrative, and analytic goals, but also what they may conceal or distort. *Important:* Embedded in the body of the essay or at the end of the essay you should produce the exported visualisations.
2. At least 500 word appendix discussing the technical process you used to create the database and visualisation. What decisions did you make in coding the data, where did you get the data from exactly, and what steps did you take in producing the visualisations.
3. If your files cannot, for some reason be uploaded directly to MMS as a zip file, you may instead upload a single page document with a link to a place where the QGIS files can be downloaded (publicly accessible or shared Google Drive or Dropbox file link, or other file sharing resource). If you choose to use this method, in order to ensure that no further modifications to the documents are made after submission, your document

with the link must include the “checksum” or MD5 hash for the zipped collection of documents (you can do this via the command line or online at a site such as this one: <http://onlinemd5.com/>). Alternatively, you may submit a USB drive on the previous meeting of class with the files.

*Considerations for Assessment:*

- Context: Did the project explanatory essay set the context sufficiently?
- Analysis: Did the project explanatory essay effectively explore the limitations and advantages of the visualisation produced or computational analysis performed?
- Combination: Did the chosen combination of a) the number of visualisations etc. produced b) a challenge in compiling the data for visualisation c) the challenge of specific techniques employed in the creation of the visualisations d) the employment of any specific forms of computational analysis of networks, text, or spatial data. Were they an appropriate combination of materials?
- Appendix: Did the appendix effectively describe the process of creating the visualisations and any analysis performed and did it properly cite the sources for the data.
- Design: Did any visualisations or maps produced clearly communicate their contents and demonstrate a good sense of design, well-chosen scales, and appropriate density of visual information?
- Restraint: Did the project avoid superfluous visualisations that contribute little to the overall project and show good judgement in what to include and exclude?
- Development: If the project used historical GIS and use the same or similar source base, then did the project show a substantive development beyond the first assessment, and make clear in the explanatory essay what that development consisted of.

**Option Three: Critical Essay (50%)**

You may, alternatively, for one or both of the assignments, write a 4,000 word essay in the genre of the critical humanities. For this alternative, you should engage effectively with the theoretical scholarship on critical digital humanities both generally and specifically for the area of focus for your essay and it must engage critically and effectively with several several pieces of scholarship that may be described as applications of the technologies studied in this module.

Alternatively you may target a particular project in the digital humanities or a published work which uses digital approaches and write a critique or evaluation of this work. Again, however, this should employ some of the critical scholarship that is relevant in your analysis.

This resembles, in some ways, the shorter essay option but must engage, passively (in footnotes) and actively (directly in the text) with a broader range of scholarship and with greater depth.

*Considerations for Assessment:*

- If the essay evaluated a digital project or publication which made use of skills in the digital humanities such as computational methods etc., and was the evaluation fair, constructive, and show a good understanding of the project being critiqued.
- Did the essay engage effectively with an appropriate amount of theoretical literature for its topic?
- Did it have a clear argument which was well supported throughout the essay?

**Option Four: Video Project (50%)**

Finally, you may create a 25 minute video project. The output should be submitted as a video file. The contents of the essay may follow completely the guidelines for Option Three above, engaging critically with the digital humanities. Alternatively, it may generally follow the guidelines for Option One or Option Two above. The key is that it is to combine the voice of the creator as narrator offering explanation and analysis, combined with the visual element of slides, maps, graphs, etc. as appropriate. In addition, the student is asked to attach a “bibliography” of sources used in the form of “film credits” at the end of the video (this may be static on separate slides or scrolling movie style). The “credits” at the end are not counted in the 20 minute limit.

*Considerations for Assessment:*

- Did the project meet the relevant considerations for assessment from the option above that most closely matches the contents?

- Was the voice narration effectively delivered in terms of speed, modulation, clarity etc.
- How effective was the visual elements of the video?
- Was the balance of time dedicated to its constitutive components effective?
- Was sufficient context and explanations offered?
- Did the video avoid overly heavy use of text.
- Was the video effective in maintaining audience engagement.

## **Guidelines**

Your submitted work should meet the following requirements:

### **Headers and Formatting**

At the top of all your written work or on a cover page, please include:

- The date of submission
- The assignment you are submitting (e.g. Historiographical Essay, Empirical Research Essay, etc.)
- Your student number
- A title for your essay or project
- The total number of words including footnotes (use the word count feature of your word processor)

When formatting your assignments, please follow these guidelines:

- Add page numbers
- Use a minimum of 12 sized font

### **Footnotes and References**

Please follow the St Andrews School of History Style Guide, available on the school website:

[School of History Style Guide](#)

### **Extensions and penalties for late, long or short work**

All final submission will be made online with final submissions to MMS. See the section on reflective posts for details on how these are handled. Please see the School of History guidelines for details about other relevant policies related to late, long or short work as well as details about extensions:

[Extensions and Penalties for Late, Long or Short Work](#)

### **Word Limits**

Assessed work with word limits should be always submitted within those limits. Writing in a clear and concise manner, and being able to structure and execute an argument that may be shorter than you feel is required is a skill that is of great use in academic fields as well as the workplace beyond. Please do not go over the limit and force yourself to work within them as a practice that will be important for writing assignments in your future careers. Please see the PGT handbook.

**Please Note:** The appendix for the project submissions has a minimum but no maximum.

## Academic Misconduct and Plagiarism

Academic integrity is fundamental to the values promoted by the University. It is important that all students are judged on their ability, and that no student is allowed unfairly to take an advantage over others, to affect the security and integrity of the assessment process, or to diminish the reliability and quality of a St Andrews degree. Academic misconduct includes *inter alia* the presentation of material as one's own when it is not one's own; the presentation of material whose provenance is academically inappropriate; and academically inappropriate behaviour in an examination or class test.

**Note on use of Large Language Models (LLMs):** Large Language Models such as ChatGPT, Bard, Claude, etc. are powerful tools that generate confident answers to user prompts. LLMs frequently produce blatantly, or sometimes more subtly false information, are unable to effectively preserve their train of thought, and susceptible to sometimes hilarious logical flaws as a result of their innate design. We are all in the process of adapting to the emergence of LLMs and any potential place in our research and writing. The wholesale generation of paragraphs of prose by an LLM for submission is not permitted and is a violation of the rules of academic practice. Students are expected to submit their own original work and are responsible for all errors of fact and reasoning. *You cannot trust anything an LLM tells you and must confirm the veracity of any historical claims it offers you.* The limited use of LLMs as part of your research and editing process is permitted (but is not recommended unless you are fully aware of their shortcomings) for the following purposes: 1) Their use in the early brainstorming stage as you are testing out ideas, making lists of possible avenues, and asking for broad overviews of topics to generate concrete hooks for more targeted research in more accurate sources. 2) To brainstorm possible structures for your writing 3) To solicit critiques of your writing at the sentence or paragraph level. 4) For suggestions on alternative phrasing. Again, for all the above points, you cannot assume LLM responses will be accurate, but asking for a range of possible responses may give you or trigger further useful ideas. Any shortcomings of your work are ultimately yours alone.

For more information:

[Academic Practice](#)

If you are unsure about the correct presentation of academic material, you should approach your tutor. You can also make use of the resources of CEED, which provides an extensive range of training on Academic Skills.

[Centre for Educational Enhancement and Development](#)

## Advice and Support for Students

For advice and support on any issue, including academic, financial, international, personal or health matters, or if you are unsure of who to go to for help, please contact the Advice and Support Centre, 79 North Street, 01334 462020, [theasc@st-and.ac.uk](mailto:theasc@st-and.ac.uk).

## Semester Dates

The Semester Dates are available at:

[Semester Dates](#)

## Marking Scale

We use a 20 point marking scale for your assignments. For more on interpreting the marking scale, see the School of History marking scale for taught Postgraduates. Please see the PGT handbook.

## Absence from Classes

Attendance is a basic assessment requirement for credit award, and failure to attend classes or meetings with academic staff may result in your losing the right to be assessed in that module.

Please read the university policy on self-certification of student absences:

[Self-certification of Absence](#)

## **Disability Support**

If you require support for disability reasons, for example teaching and exam arrangements, please contact the Disability Team in Student Services who can provide support for a wide range of disabilities such as learning difficulties, visual and hearing impairments, mobility difficulties, Asperger's, mental health, long standing medical condition and much more.



## Main Readings

**SPATIAL** Gregory, Ian N., Don DeBats, and Don Lafreniere, eds. *The Routledge Companion to Spatial History*. Routledge 2018

**GREGORY** Gregory, Ian N., and Paul S. Ell, eds. *Historical GIS: Technologies, Methodologies, and Scholarship*. Cambridge Studies in Historical Geography, no. 39. Cambridge: Cambridge University Press, 2008. [Library ebook](#)

**LÜNEN** Lünen, Alexander von, Charles Travis, eds. *History and GIS: Epistemologies, Considerations and Reflections*. Dordrecht ; New York: Springer, 2013. [Library ebook](#)

**BODENHAMER** Bodenhamer, David J., John Corrigan, Trevor M. Harris, eds. *The Spatial Humanities: GIS and the Future of Humanities Scholarship*. Bloomington: Indiana University Press, 2010. [Library ebook](#)

**GEDDES** Gregory, Ian N., and Alistair Geddes. *Toward Spatial Humanities: Historical GIS and Spatial History*. Indiana University Press, 2014. [Library ebook](#)

**KNOWLES** Knowles, Anne Kelly, and Amy Hillier. *Placing History: How Maps, Spatial Data, and GIS Are Changing Historical Scholarship*. ESRI, Inc., 2008.

**PAST** Knowles, Anne Kelly *Past Time, Past Place* ESRI Press, 2002.

**DEEP** Bodenhamer, David. John Corrigan, Trevor M. Harris *Deep Maps and Spatial Narratives* Indiana University Press, 2015 [Library ebook](#)

**RAU** Rau, Susanne, Ekkehard Schönherr, eds. *Mapping Spatial Relations, Their Perceptions and Dynamics: The City Today and in the Past. Lecture Notes in Geoinformation and Cartography*. Cham ; New York: Springer, 2014. [Library ebook](#)

**SCOTT** Scott, John *Social Network Analysis* 4th Edition (3rd will also suffice) London: Sage, 2017.

**SILGE** Silge, Julia and David Robinson *Text Mining with R* O'Reilly (2017) [free online version](#)

**JOCKERS** Jockers, Matthew L. *Text Analysis with R for Students of Literature* Springer (2014) [Library ebook](#)

**LUKE** Luke, Douglas A. *A User's Guide to Network Analysis in R* Springer (2015) [Library ebook](#)

## Managing Your Time During the Semester

You should expect to spend about 20 hours each week in preparation for this seminar module (40 credits out of your 60 credits for the semester), with the remaining third of your weekly study time dedicated to your core module (20 credits). I strongly suggest you set aside regular time every week, across at least three days of the week, that is especially allocated to this module in order to balance out the time you dedicate to it throughout the semester. Readings for the module are relatively light and will rarely involve more than half the time and you should never consider your preparation done for the week when the readings are complete. The majority of your time should be spent on your projects. You don't need extensive notes on the readings, focus less on the particulars of specific historical projects we may read about but instead on the methodologies, weaknesses and strengths regarding them, and bigger connections that connect to other readings and themes we have been discussing.

After you finish the readings for the week, use the remaining time you have set aside for source *research*, *experimentation*, *play*, and data *exploration*. This should eventually, but not immediately, be directed towards the broader end of becoming more familiar with the technologies introduced in the module, and most of all, helping you towards the development of the projects for your two assessments. Bring your ideas, as they develop, into the module discussion and share them with your fellow students as well. I cannot stress enough that this time is important. You will quickly find that, even when you have a firm project idea in mind, the sources settled, and a goal in sight, the majority of time in project development will go towards cleaning or preparing data, tinkering with software, googling obscure errors, watching YouTube tutorials or diving into bulletin boards about specific features or tasks you wish to perform, and, alas, it is *very common* to discover that a project is ultimately not viable with the original approach or data, and a switch in direction is needed. *A critical ingredient for success is, therefore: to allow time for productive failure and new beginnings.*

This is a computer screen intensive module. Though this may seem like an obvious point, it is worth reminding you here that it is not healthy to sit and stare at a computer screen for long periods. I suggest you try working in [periods of 25 minutes](#) or so with the help of a timer, forcing yourself to get up and take a break regularly.

## Broadening Your Knowledge

If you would like broaden your knowledge in this area early in the semester, consider trying some of the following tasks. If you have challenges with software installation and such, then don't worry too much, we will try to address some of these issues during the semester.

1. Read the short book by Franco Moretti, *Atlas of the European Novel, 1800-1900* and the fun but very informative book by Mark Monmonier *How to Lie with Maps*
2. Attempt to install [QGIS](#) and [Gephi](#) on your laptop
3. Attempt some of the tutorials at [Tutorials for MO5161 Skills in Transnational History](#) - please note that these tutorials were developed for QGIS 3.0 and there may be some minor differences between your QGIS version and the one in the video. Let me know about specific problems you encounter.
4. Attempt to download and install [R](#) and the free [R Studio Desktop OpenSource License](#). If you would like to get started with the world of R, consider a book such as *Learning R* by Richard Cotton, or any of the many online tutorials. *Note:* All the skills using R we will encounter in this module can also be done in the even more popular programming language of Python. If you think you might someday want to learn more programming, I'm happy to guide students towards resources that will allow them to do any of the module tasks in Python instead of R.
5. Browse and experiment with instructional materials at [A Gentle Introduction to QGIS](#), and try Chapter 1 of *Text Analysis with R for Students of Literature* ([library ebook](#))

## Resources to Explore

As you do work on your projects you will find plenty of inspiration surveying the explosion of scholarship over the last decade or two. The following are some journals, hosts of projects, link hubs, and aggregators:

[Digital Humanities Quarterly](#)  
[International Journal of Humanities and Arts Computing](#) (formerly *History and Computing*)  
[Digital Scholarship in the Humanities](#) (formerly *Literary and Linguistic Computing*)  
[Language Resources and Evaluation](#) (formerly *Computers and the Humanities*)  
[Historical Methods: A Journal of Quantitative and Interdisciplinary History](#)  
[Journal of Cultural Analytics](#)  
[Digital Literary Studies](#)  
[Digital Studies / Le champ numérique](#)  
[Journal of Data Mining and Digital Humanities](#) [Digital Humanities Now](#)  
[Spatial History Project at Stanford University](#)  
[The Historical GIS Research Network](#)  
[Historical GIS Lab Bibliography](#)

Other journals that also have some relevant publications:

[Social Science History](#)  
[Historical Geography](#)  
[Journal of Historical Geography](#)  
[Social Science Computer Review](#)  
[Transactions in GIS](#)  
[Environment & Planning A/B/C/D/E](#)  
[Environmental History](#)  
[Annals of GIS](#)

## Striking Out on Your Own

During the semester, you may decide that you want to deepen your knowledge and skill set in one or more of the technologies that are introduced in the module. A great many of the humanities scholars who have adopted some of the digital methodologies, tools, and techniques that we will encounter in this module do not have much in the way of formal training in computer science or related fields. With the exception of some short training courses in GIS and one-off sessions at digital humanities workshops and [unconferences](#), I have no formal training in any of

the skills in this module. Self-learning with online resources, videos, and books are a common way to expand your abilities in these fields.

[Programming Historian](#) - This is by far the best resource online for tutorials covering a wide variety of digital humanities related tasks that are useful for historical research.

[Mapping and GIS for Historians](#)

[GQIS Tutorials and Tips](#)

[ProfHacker](#)

[TAPoR 3 Research Tools for Studying Texts](#)

[GIS Lounge](#)

[Introduction to Programming for Humanists \(Python\)](#)

[Digital Humanities Slack Channel](#)

[The Spatial Community Slack Channel](#)

[Digital Humanities Answers](#)

[Stack Overflow](#)

## **Learning GIS**

*QGIS Map Design* 2nd Edition Anita Graser & Gretchen N. Peterson

*Learning QGIS* Anita Graser

*Mastering QGIS* Kurt Menke et al.

*GIS Cartography: A Guide to Effective Map Design* by Gretchen Peterson *Discovery QGIS 3.x* Kurt Menke

*Historical GIS: Technologies, Methodologies, and Scholarship* Gregory, Ian N., and Paul S. Ell, eds.

*Introduction to GIS* Victor Olaya

*Geospatial Analysis: A Comprehensive Guide* Michael J de Smith

*An Introduction to Geographical Information Systems* Ian Heywood, Sarah Cornelius

*Thematic Cartography and Geovisualization* Terry A. Slocum, Robert B McMaster et al

*Spatial Data Analysis: An Introduction For GIS Users* Christopher Lloyd

*GIS: A Short Introduction* Nadine Schuurman

*An Introduction to R for Spatial Analysis and Mapping* Chris Brunsdon, Lex Comber

## **Text Analysis**

*Text Mining with R* Julie Silge, David Robinson

*Text Mining in Practice with R* Ted Kwartler

*Text Analysis with R for Students of Literature* Matthew L. Jockers

*Applied Text Analysis with Python* Benjamin Bengfort

*Natural Language Processing with Python* Steven Bird

*Humanities Data in R: Exploring Networks, Geospatial Data, Images, and Text* Taylor Arnold, Lauren Tilton

*Mastering Regular Expressions* Jeffrey E. F. Friedl

*An Introduction to Statistical Learning with Applications in R* Gareth James et al

## **Social Networks**

*A User's Guide to Network Analysis in R* Douglas A. Luke

*Mastering Gephi Network Visualization* Ken Cherven

*Social Network Analysis* John Scott

*Social Network Analysis: Methods and Applications* Stanley Wasserman

## **General Texts**

*Data Visualization: A Practical Introduction* Kieran Healy *Basic Statistics for Social Research* Augustine Kposowa, Mark D. Riddle, and Robert Hanneman

*R for Data Science* Hadley Wickham, Garret Grolemond

*ggplot2: Elegant Graphics for Data Analysis* Hadley Wickham

*Learning R* Richard Cotton

*The Book of R* Tilman M. Davies *Learning Base R* Lawrence Mark Leemis

*Learning Python* Mark Lutz

*The Linux Command Line* William E. Shotts

## Week 1 - Orientation and Introduction to Historical GIS

Our emphasis in this course is on a set of skills related to GIS and mapping, social networks, and tools for the analysis of texts which, to obtain even a moderate proficiency in, would each require several modules. These are skills that are often associated with a field that has come to be known as the *digital humanities*. This module should be seen as a kind of taster course that allows you to encounter a world of digital tools and methodologies that may be useful for working with large collections of sources. You may decide that most or all of these methods are not appropriate for your own research going forward, but some exposure to them will greater afford you the opportunity to understand them and, when appropriate engage or critique other historical scholarship that makes use of them.

We will have three primary goals in this semester:

1. In three broad parts, we will learn some of the basic principles and techniques of *historical GIS*, digital techniques for *text analysis and distant reading*, and some basic *visualisation of social networks*. In the three assessments of the module you will have the opportunity to practice some of the techniques learned or, alternatively, write a critical engagement with scholarship that makes use of these methodologies. This part of the module is arguably both the most fun and the most frustrating: you should prepare yourself for the sometimes considerable amount of time spent sorting out what can often be rather trivial technical obstacles along the way. One of the goals of this course is to introduce you to the problem solving mindset required to face these difficulties by effective use of online resources.
2. In the case of each set of technologies, we will read some historical scholarship that has made use of these approaches in order to better see how they are being employed in scholarship today. When reading these texts, it is not important for you to focus on the particulars of each historical case, but instead pay close attention to how the historian makes use digital methodologies in the support of their argument. We will try to highlight what added benefits there are in employing these methodologies, either alone, or in mixed method scholarship that integrates them with other historical approaches.
3. Finally, this module will, throughout, introduce you to some of the work of what has been called the *critical digital humanities*. We will examine some of the powerful critiques that have been made of GIS both among historians and within the world of geography, where it had its biggest impact on scholarship. We will similarly examine critical discourses on other digital methodologies and in our discussions of the essays applying them that we read. Ask yourself, how much does the argument depend on the technological approach? What assumptions are made in setting the stage for the scholarship, in preparing the date, and in using the technologies? What are the costs implied, and the benefits gained? To what degree does the choice of methodology influence the kinds of questions asked and outcomes obtained?

### Preparation

#### Introductory Reading

- Moretti, Franco. *Atlas of the European Novel, 1800-1900* Verso 1998, p1-73 (Ch 1: The Novel, the Nation-State)
- Harley, J. B. "Deconstructing the Map" in Michael Dear and Steven Flusty eds. *The Spaces of Postmodernity: Readings in Human Geography*, 277-288

If you can, try to find some time for these:

- KNOWLES Ch 1 "GIS and History" 1-27 (see Files)
- GREGORY Ch 1 "GIS and its role in historical research: an introduction" 1-19
- GEDDES Fragment of Ch 4, only section "Environmental Management" 104-111

### Tasks

1. Examine two of the most famous maps cited in scholarship on mapping and GIS: Charles Joseph Minard's [map of Napoleon's Russian Campaign](#), and the famous [cholera map](#) of John Snow (you can read more about this here: [Map-making and Myth-making in Broad Street](#)). Then take a look at Joseph Priestley's [A New Chart of History](#). Why have they come to be regarded as excellent historical examples of visualisations that communicate an idea very clearly? Where might a critique of them begin?

2. If you haven't already done so, please try to **download and attempt to install QGIS**. If you have problems, please make note of what issues appear and bring them in.

*General Tips Regarding Installation Problems:* Many of the multi platform open source applications out there these days make use of Java. Sometimes the version of Java pre-installed on your laptop (or, indeed, not installed or active) will be the key problem for getting the application to function smoothly. Installing or updating the appropriate Java version can often fix these issues. Also, if you find yourself presented with unusual error messages, searching google with a large part or all of the error message in quotation marks will often lead you to bulletin boards where people have faced similar issues and tried different steps to resolve the issue (though *please* evaluate recommended instructions on random bulletin boards with great care and ensure your machine is backed up before trying anything too elaborate!). The website [Stack Exchange](#) often has useful discussions that address software issue. The [PC Classrooms](#) on campus should have QGIS 3.x installed and you may use them for your project work.

## **Weeks 2-5 - Mini-Presentations and Handouts: Reading Selection for Presentations on Historical GIS Scholarship**

Using the thread created for this purpose on Microsoft Teams **sign up to do one 5 minute non-assessed presentations** (not a minute more!) each on the "application" texts (one student per text) in the *Reading Selection* list below. These presentations will be given Week 2, Week 3, or Week 4. In addition, sign up for a second and third text which you will prepare a handout for, but not actually present on.

- **Make a handout about each of the three texts** (only one of which you will present on) which is on a single or double-sided page. No more than two sides. Submit the digital file for the handout as a PDF to the module Team Files tab in the handout folder for everyone's access before the class day that you will present on.
- In the presentation comment on the way that GIS or mapping was used in the text. Comment on what data was used for the project and what kind of effort might have been involved in preparing it for GIS. Were there any innovative or useful ideas to draw from the text as potential inspiration for our projects? Was GIS used primarily for *heuristic*, *illustrative*, or *explorative* purposes, visualising sources or data in order to discover new questions and spot patterns to press the historical research forward? Was GIS employed using formal *analysis*, that is to say, did it make use of quantitative methodologies, spatial statistics, or other algorithmic techniques (if so, list what specific ones were used in the handout) towards the end of making concrete spatial claims?
- Please skim 3-5 other chapters of interest from among these over the next few weeks for inspiration for your map project.\*

This week will explore the field that has become known as Historical GIS, but more broadly the analysis of geographic data within the humanities in general, as well as some of its basic approaches and promise. Beginning this week, and continuing through week four, you will all be asked to give short presentations and prepare summary handouts on some examples of scholarship making use of GIS. We will set aside time this week to discuss the first project assessment, and some potential topics and sources that you may consider using for the assessment.

*See the preparation section above for presentation info.*

### **GEDDES**

Ch 1 "Railways and Agriculture in France and Great Britain" 4-30 Schwartz and Thevenin

Ch 2 "The Development, Persistence and Change of Racial Segregation in U.S. Urban Areas" 35-59 Andrew Beveridge

Ch 3 "Troubled Geographies: A Historical GIS of Religion, Society, and Conflict in Ireland since the Great Famine" 62-83 Ian Gregory

Ch 5 "The Politics of Territory in Song Dynasty China" 118-140 Ruth Mostern

### **KNOWLES**

Ch 2 "Creating a GIS for the History of China" Peter K. Bol (see Files)

Ch 4 "Scaling the Dust Bowl" Geoff Cunfer (see Files)

Ch 6 "Mapping Husbandry in Concord: GIS as a Tool for Environmental History" Brian Donahue

Ch 8 "New Windows on the Peutinger Map of the Roman World" Talbert and Elliot

### **PAST**

Ch 2 "Teaching the Salem Witch Trials" Benjamin Ray (see Files)

Ch 3 "Similarity and Difference in the Antebellum North and South" Aaron C. Sheehan-Dean (see Files)  
Ch 6 "Redlining in Philadelphia" Amy Hillier (see Files)

#### BODENHAMER

Ch 7 "Mapping Text" May Yuan

#### DEEP

Ch 4 "Inscribing the Past: Depth as Narrative in Historical Spacetime" Ethington and Toyosawa  
Ch 7 "Spatializing and Analyzing Digital Texts: Corpora, GIS, and Places" Gregory, Cooper, Hardie, and Rayson  
Ch 8 "GIS as a Narrative Generation Platform" Yuan, McIntosh, and Delozier

#### SPATIAL

Ch 1 "Re-focus on Women in an Industrial Revolution..." Sherry Olsen  
Ch 4 "Railroads and Population Distribution..." Alvarez-Palau and Martí-Henneberg  
Ch 6 "Mapping the American Iron Industry" Anne Kelly Knowles  
Ch 9 "Geographies of Welfare in Nineteenth Century England and Wales" Douglas H L Brown  
Ch 13 "Kleindeutschland: the lower east side in new york city...1880s..." Kurt Schlichting  
Ch 15 "A City of the White Race Occupies its Place..." Lutz et al  
Ch 17 "The Post, The Railroad and the State" Gustavo Velasco  
Ch 19 "Food, Farms, and Fish in Great Britain and France, 1860-1914" Robert M. Schwartz  
Ch 20 "White Maps and Black Votes..." Don DeBats  
Ch 21 "The Spatial History of State Power" Ruth Mostern  
Ch 22 "Peasants and Politics - How GIS Offers new insights into the German Countryside" George Vascik  
Ch 23 "Mapping Inequality 'Big Data' meets social history in the story of redlining" Connolly et al  
Ch 25 "Urban Property in Nineteenth-Century Rio De Janeiro: Rent, neighborhoods, and networks" Zephyr Frank

#### RAU

Ch 3 "Peopling the Past: Interpreting Models for Pedestrian Movement in Ancient Civic-Ceremonial Centres" Morton et al  
Ch 5 "Lyons, the Spatial Analysis of a City in the 17th and 18th Centuries. Locating and Crossing Data in a GIS Built from Written Sources" Gauthiez and Zeller  
Ch 6 "Mapping Long-term Urban Space Structures: Barcelona as a Case Study" Bassols and Garriga

Dear, Michael J. *GeoHumanities: Art, History and Text at the Edge of Place* Routledge, 2011. [Library ebook](#) Ch 25  
"Without Limits: Ancient History and GIS" Alexander von Lünen et al.  
Ch 26 "History and GIS: Railways, Population Change..." Robert M. Schwartz et al.  
Ch 30 "What do Humanists Want? What do Humanists Need? What Might Humanists Get?" Peter K. Bol

## Week 2 - QGIS: Basics and Georeferencing Historical Maps

We will open today with a discussion of some basic GIS terminology, concepts, and the components which are required for using GIS software. We will discuss the readings and have presentations on some applications of GIS in historical scholarship. We will then use most of the remainder of the time to work on learning the basic functionality of QGIS and the georeferencing of historical maps, which is a common task for many history projects. We will set aside class time to further talk about the first assessment, the expectations and share thoughts on what you wish to do in this regard.

Some of the QGIS basics we will work on, time permitting include:

- Adding and manipulating layers in QGIS
- Adding a simple layer with some points from a CSV file
- Importing shapefiles
- Adding basemaps
- Georeferencing and georectifying a historical map
- Adding additional features to a layer using a georeferenced or other basemap
- Basic querying of spatial data on maps
- Basic choropleth and graduated point symbol maps

### Preparation

1. Watch some of these videos and try some of this yourself, some of it will be review material from last week: [QGIS 3 Tutorials for MO5161](#)
2. We will have some presentations today, see last week for more on how to prepare.
3. Some of the readings today point to the controversies over the use of GIS that created considerable tension within the field of Geography and has similarly sparked debates among historians. As these will emerge multiple times, consider noting down some of the main issues and different perspectives along with some of the major participants in these debates mentioned.
4. There are a number of technical concepts that arise this week. In fact, some of them show up in two or three of the readings so if you understood it clearly the first time, you can skim or merely review the understanding of the concept in the other readings. If they are not clear from the readings, consider looking into them a bit more: Data models, Vector and raster data, MAUP modifiable areal unit problem, Ecological Fallacy, Spatial autocorrelation, Generalization (in the context of GIS), Least cost path analysis, Epistemology and Ontology (in the context of GIS)
5. Browse the [David Rumsey historical map collection](#) and especially its offerings in the areas of your interest.

### Required Reading

Victor Olaya *Introduction to GIS* 2018 pp1-36, pp87-98 - This is a wonderful short volume that covers a great deal of the basic terminology and concepts. Very affordable physical copy available for order online, or [various free formats here](#))

Nadine Schuurman *GIS: A Short Introduction* Ch 2 "GIS, Human Geography, and the Intellectual Territory Between Them" pp21-52 (see Files)

DEEP Ch 3 "Genealogies of Emplacement" pp54-71



## Further Reading

GREGORY Ch 4, 5, 6, 8

Monmonier, Mark. *How to Lie with Maps*. 3rd Edition. University of Chicago Press, 2018.

Schuurman *GIS: A Short Introduction* Ch 3 “The Devil is in the Data”, Ch 4 “Bringing it All Together”

John Pickles ed. *Ground Truth: The Social Implications of Geographic Information Systems* 1995 esp. Preface, Ch 1, 3, 7

Hill, Linda L. *Georeferencing: The Geographic Associations of Information*. Digital Libraries and Electronic Publishing. Cambridge, Mass: MIT Press, 2006, Ch 5 Gazetteers and Gazetteer Services [Library ebook](#)

Fotheringham, A. Stewart et al. *The SAGE Handbook of Spatial Analysis*. (2009).

Ch 6 Spatial Autocorrelation

Ch 7 The modifiable area unit problem (MAUP)

Ch 23 Spatial Analysis on a Network

## Reference Reading

Note: QGIS is now at 3.x so some instructions may be slightly off when it comes to some features in various links below

[QGIS 3 Tutorials for MO5161](#) - This is a collection of YouTube tutorials I created for this module. Over the next few weeks, please watch as many of these as you can, and try the exercises yourself in QGIS. [Mapping and GIS for Historians](#) - This was designed for QGIS 2 but most tutorials should still work with little change. [A Gentle Introduction to QGIS](#) - Documentation for QGIS 3.4

The following may be useful to you in getting acquainted with QGIS. See also the *Striking Out on Your Own* section above in this handbook:

Graser, Anita. *QGIS Map Design* 2nd Edition (Not in Library) - Really great collection of task oriented tutorials. Menke, Kurt *Discovery QGIS 3.x* (Not in Library) - Lots of interactive tutorials in this work.

[QGIS Training Manual](#)

[QGIS Tutorials and Tips](#)

## Suggestions for Play and Exploration

- [Why All World Maps Are Wrong](#) - watch this nicely composed Vox video on projections, and check out this [XKCD comic](#) on map projections.
- Play with the Mercator project and [nation sizes here](#).
- [Stanford Spatial History - Gallery of Projects](#) - Visit this gallery of projects and examine a few of them for possible inspiration. Note that some of them merely have screenshots (many of them were once interactive with the plug-in Flash, which is no longer supported by its developers) and reflect on the problem of technological obsolescence on the web.
- Think about historical works that have impressed you or which you think are important for your area of interest. Are there aspects or sources which are or might benefit from a more spatially explicit approach? Do the works make use of maps or spatial visualization in an effective way? Could they have? If so, how might it have been done? What sources in your area of interest might lend themselves well to *heuristic* or *analytical* or *illustrative* use of maps and GIS?
- If your chosen readings for presentations include work that use analytic GIS techniques or spatial statistics, look up the method that was used and read more about it. Find out if/how the method can be done within QGIS, evaluate the strengths or weaknesses of the method. What kinds of assumptions does it make or other problems may arise?
- Look up one or more of the source bases used in some of the reading selections for presentations. Are any of them available online and easily accessible? Are sources like it or of the same type or class available in your area of interest and easily accessible? How might you get a hold of them for use in your own research?
- Start thinking about your first assessment and come up with half a dozen possible ideas to explore. Start chasing down information for it, or putting in inter-library loan requests if required.
- If you don't have it yet, apply for a SCONUL card in the library to help you get access to other large research libraries in the area. Consider getting a reader card at the National Library of Scotland and read up on the procedure for the use of the library, which is in Edinburgh.
- Look to the weeks ahead and identify techniques or skills that you think you might be especially interested in. Jump ahead and start learning in that area.



- As you learn some of the basics of using QGIS, especially the georeferencing of historical maps, creating new vector layers from the information, and visualising historical data with choropleth maps and graduated symbols, spend some serious time this week looking at potential sources out there: historical maps, historical data (already digitised and georeferenced, or not), spatial claims that can be illustrated or potentially questioned with spatial analysis. Also use play time to practice your skills working with georeferencing maps of different kinds. Start thinking about the kinds of obstacles and challenges you may face among your project ideas.

## Week 3 - QGIS: Techniques for Exploration and Analysis of Spatial Data

Our goal in this second hands-on QGIS session is complete a review of any techniques we didn't find time for in the previous week, and then continue with further skills from the list below. We will continue with the presentations that were signed up for in week one, but the readings for this week, which are generally in the area of critical GIS, will be mostly rolled into our discussion in week four.



XKCD Comic 2029 "Disaster Movie"

Some QGIS techniques for today, as time permits:

- Creating a heat map
- Creating and using buffers
- Clipping, difference, and intersect
- Joins (Spatial, Table, Summary), Counting Points in Polygons, and Field Calculation
- Counting points in polygons
- Distance Matrix and Nearest Neighbor Analysis
- Depicting routes
- Creating a time series in QGIS + alternative online tools
- Some other geoprocessing techniques
- Exporting your map and post-processing
- GeoJSON and its uses

### Preparation

1. [QGIS 3 Tutorials for MO5161](#) - Please continue doing tutorials on our website
2. See the module Moodle for an updated list of YouTube videos to watch on the some of the above techniques, along with some reference websites related to the QGIS techniques we will discuss. Please watch as many of the videos as you can, but you may skip those for techniques you are don't think you will ever need. There are some exercises there for you to try in preparation for our meeting.
3. If you are giving a 3-5 minute presentation, please prepare it and if you haven't distributed it yet, submit and bring copies of a third chapter as instructed above.
4. This week you should use almost all of your time practising QGIS, in play and experimentation and directly working on your project. Make progress this week to allow for changed directions, frustrations, or distractions to come.

## Required Reading

- Joanna Drucker [“Humanities Approaches to Graphical Display”](#)
- BODENHAMER Ch 3 “Geographic Information Science and Spatial Analysis for the Humanities” pp31-73
- KNOWLES Ch 5 “‘A Map is Just a Bad Graph’: Why Spatial Statistics are Important in Historical GIS” pp123-150 (see Files)

## Further Reading

- Joanna Drucker [“GIS Analysis and Critical Issues”](#)
- Albrecht, Jochen *Key Concepts & Techniques in GIS* Sage, 2007.
- Lloyd, Christopher *Spatial Data Analysis: An Introduction For GIS Users* Oxford University Press, 2010
- Smith, Michael J. *Geospatial Analysis: A Comprehensive Guide*. Drumlin Security Ltd, 2018.

## Reference Reading and Links

[QGIS Documentation: Vector Overlay](#) - Clip, Difference, Intersection, Union, etc.

[QGIS Documentation: Buffers](#)

[QGIS Training Manual: Vector Analysis](#)

[QGIS Training Manual: Network Analysis](#)

[QGIS Training Manual: Spatial Statistics](#)

[QGIS Documentation: Interpolation](#)

[QGIS Tutorial: Spatial Joins](#)

[QGIS Tutorial: Table Joins](#)

[QGIS Tutorial: Points in Polygon](#)

[QGIS Tutorial: Heat Maps](#) - Note: this has changed in QGIS 3.x

[QGIS Tutorial: Nearest Neighbor Analysis](#)

[QGIS Tutorial: Interpolation](#)

[Introduction to QGIS Time Manager](#)

[Anita Graser - Index of Posts on QGIS Time Manager](#)

[Brief Introduction to GeoJSON](#)

[GeoJSON.io](#)

## Suggestions for Play and Exploration

- Determine what QGIS skills will be most important for your project and look for more instructional websites and youtube clips about these techniques. Practice on some data, even if you don't have your own project data ready.
- Use remaining time to explore potential sources and work on your project, experimenting and testing ideas.

## Week 4 - Thinking With/Against Maps and Spatial Analysis

For several weeks now we have been learning some very basic skills in QGIS and mapping. The promise of using GIS software for mapping, and the more advanced geographical analysis that becomes possible with it should be apparent. This week we will check with all of you on the progress in your work on the map project. We will discuss what constitutes effective use of maps and some of the ways that your map project will be evaluated. We will also have any remaining short presentations on the readings on applications of historical GIS. All of our remaining time, however, will be dedicated to a discussion of the various critical and theoretical readings we have done about GIS as a tool and methodology.

### Preparation

1. Any remaining presentations should be prepared for and your additional handout should be submitted and distributed.
2. Be prepared to share your work on your map project so far, if you are working on one, including the kinds of sources you are using or evaluating, what challenges you have had so far, and questions you might have. If you are working on a critical essay, be ready to share what direction you will be taking it.
3. Make substantive progress on your first project or essay.
4. Optional: Sometimes GIS is just overkill and creating a good map for illustration just needs some time spent tracing existing maps and adding your own features. For this, learning how to use Bezier curves is a great plus but requires that you have Vector drawing software. Commercial packages like Adobe Illustrator and Affinity Design among many other options work great but cost money. If you think you might want to trace maps, try learning how to use Bezier curves with the [Bezier game](#). Install [Inkscape](#) and try tracing a simple map. A few more videos on how to use Bezier curves: [1](#), [2](#), [3](#), [4](#)

### Required Reading

Curry, Michael *Digital Places: Living with Geographic Information Technologies* [Library ebook](#)

Ch 1 "Reason and Language in Geographic Information Systems" 11-23

Ch 2 "On Space in Geographic Information Systems" 24-38

LÜNEN

Ch 11 "GIS and Research into Historical 'Spaces of Practice': Overcoming Epistemological Barriers" Sam Griffiths

Ch 12 "GIS and History: Epistemologies, Reflections, and Considerations" Charles Travis

Ch 14 "Tracking in a New Territory: Re-imaging GIS for History" Alexander von Lünen

### Further Reading

- Wilson, Matthew W. *New Lines: Critical GIS and the Trouble of the Map* 2018 (not in library)
- Pickles, John. *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World*. Routledge, 2012.
- Massey, Doreen B. *For Space*. London; Thousand Oaks, Calif.: SAGE, 2005.
- Cope, Meghan, and Sarah Elwood *Qualitative GIS: A Mixed Methods Approach* Sage, 2009
- "Elements of Historical Knowledge About Urban Spaces: Reflections on the Requirements for a Dynamic Map" Ekkehard Schönherr in Rau, Susanne, Ekkehard Schönherr, eds. *Mapping Spatial Relations, Their Perceptions and Dynamics: The City Today and in the Past. Lecture Notes in Geoinformation and Cartography*. Cham; New York: Springer, 2014. [Library ebook](#)
- Jobst, Markus, et al. *Preservation in Digital Cartography: Archiving Aspects*. Berlin; London: Springer, 2010. [Library ebook](#)
- Travis, Charles, Francis Ludlow, and Ferenc Gyuris, eds. *Historical Geography, GIScience and Textual Analysis: Landscapes of Time and Place*. Springer Nature, 2020. [Ebook](#)

### Reference Reading

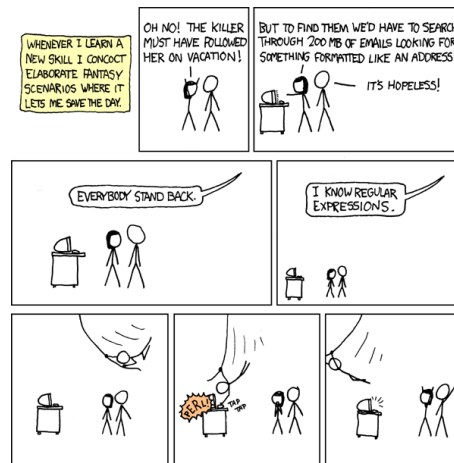
- Slocum, Terry A., Robert B. McMaster, Fritz C. Kessler, and Hugh H. Howard. *Thematic Cartography and Geovisualization*. 3 edition. Pearson, 2013.
- Tufte, Edward R. *The Visual Display of Quantitative Information*. Graphics Press, 2001.

### **Suggestions for Play and Exploration**

- See earlier weeks for some suggestions. However, the majority of time should now be devoted to the development of your map project.

## Week 5 - Using the Command Line, Regular Expressions

The main task of today is to work with regular expressions (regex). The art of regex is an important foundation skill for mining textual information in many different contexts. A regex is a collection of symbols and characters used to identify a pattern, allowing you to search large bodies of text to *match* a designated combination of characters, words, or phrases which might, for example, simultaneously exclude other characters or words. We can do this directly through a web browser on certain sites but some dialect of regular expressions is built into powerful word processing software, many command line utilities such as *grep* and almost every programming language. We will also explore some of the other possibilities of using the command line on your computer, and software for OCRing documents that can then be searched or cleaned up with regular expressions. The various tasks below asking you to install software are optional. They are useful if you want to learn and try working with utilities on the command line (and you don't have a Mac) or work with Tesseract, but this will not be required, especially if you don't plan on doing any OCRing of historical documents, or plan to use other commercial OCR software.



XKCD Comic 208 "Regular Expressions"

### Preparation

1. Please install a good text editor that can support regular expressions. You can download the free Microsoft [Visual Studio Code](#) available for Mac, Windows, and Linux. There is a significant learning curve, but if you want to go full scale 1970s classic editing power, I am personally a daily user of (and this handbook was composed in) the powerful tool [VIM](#) (Mac OS X users see also [MacVim](#) and [VimR](#)). Its bitter arch-enemy (the two of them have been battling it out for supremacy in the geek community since 1976) is [Emacs](#).
2. Optional: Install [Tesseract](#). This can be done easily via [HomeBrew](#) on OS X, or the package manager if you want to use a [VirtualBox](#). There is also a windows installation but I'm not familiar with its use.
3. In class we will work through the [Interactive Tutorial](#) for regular expressions, but give it a try before coming to class. Read two somewhat silly examples of using regular expressions here: [Reformatting Confucius with Regular Expressions](#) and [Finding the Women of Heimskringla with Regular Expressions](#)
4. If you get the hang of regular expressions before class, try [Regex Crossword](#) (This only works in Safari and Chrome for me, try a different browser if it doesn't work for you).
5. There is very little required reading today. Take advantage of this time to work on your assessments.

### Reading

[Introduction to Bash](#) - Note: If you are using Windows, you will need to install git bash, available as part of [Git for Windows](#)

[Interactive Tutorial](#) - Again, please go through this tutorial. We'll practice more in class.

'Q-i-jtb the Raven': [Taking Dirty OCR Seriously](#) Ryan Cordell

[OCR Failures in 2016](#) Ben Schmidt

### Further Reading

[Mining for the Meanings of a Murder: The Impact of OCR Quality on the Use of Digitized Historical Newspapers](#)  
Carolyn Strange et al. in *Digital Humanities Quarterly*

[Understanding Regular Expressions](#) - a tutorial using [LibreOffice](#) Writer

[Cleaning OCR'd text with Regular Expressions](#) - a tutorial using Python programming language

[In the Beginning was the Command Line](#), 1999 by novelist Neal Stephenson (skim)

[ProfHacker posts on the Command Line](#)

### Reference Reading

- Jeffrey E. F. Friedl *Mastering Regular Expressions* 2nd Edition O'Reilly - very helpful and thorough overview of regular expressions
- Tony Stubblebine *Regular Expressions Pocket Reference* 2nd Edition O'Reilly

## Week 6 - Independent Learning Week

Week six of the fall semester is an independent learning week at St Andrews. Independent Learning Week is a learning week, not a holiday; it is integrated into the curriculum. The majority of time this week should be dedicated to the completion of your map project and on catching up on any reading you may have fallen behind on. In addition, please read the following short pieces to prepare for the transition to the second part of the semester:

Joanna Drucker, "Humanistic Theory and Digital Scholarship" in Gold, Matthew K., eds. *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press, 2012. [Library ebook](#)

[Where to Start with Text Mining](#)

[Literature Is not Data: Against Digital Humanities](#)

[Using Metadata to find Paul Revere](#)

## Week 7 - An Introduction to Large Language Models

LLMs are very often seen as problematic but exciting tools for the generation of written text and getting answers to questions about the world. Our focus here, however, is on the potential of LLMs for: extracting information from a supplied text, processing or transforming a supplied text, composing code, explaining code. We will also discuss some of the debates around LLMs today.

### Preparation

1. Please [sign up](#) for a free ChatGPT account. If you have any problems doing so, then you may use [Google Bard](#) or [Bing Chat](#) (requires Edge browser), or [Claude](#)
2. Walk through the [Learn Prompting](#) website, just the “Basics” and “Basic Applications” section. You don’t need to use the “prompting embeds” that requires you to input an OpenAI key, just copy and paste prompts into ChatGPT if you want to try them there.

### Readings

Below are a selection of recent articles discussing and debating the use of LLMs. Please try to browse or skim through as many of these as you find time for:

- LLMs and Education:
  - [Student Use Cases for AI](#)
  - [Liberal-ly-educated students need to be more than consumers of AI](#)
  - [We can save what matters about writing—at a price](#)
  - [Teaching with AI - OpenAI](#)
  - [AI’s Teachable Moment: How ChatGPT Is Transforming the Classroom](#)
  - [“What is Good Writing in the Age of ChatGPT?”](#)
  - [Don’t use AI detectors for anything important](#)
  - [Why I’m Excited About ChatGPT](#)
  - [Will ChatGPT Kill the Student Essay? Universities Aren’t Ready for the Answer](#)
  - [ChatGPT in Education: Boon, Bane, and Beyond](#)
  - [Should educators worry about ChatGPT?](#)
  - [Experimenting with LLMs to Research, Reflect, and Plan](#)
  - [The End of High-School English](#)
  - [AI is going to make teaching worse, but not in the way everyone thinks](#)
- LLMs in Scholarship:
  - [Using GPT-4 to measure the passage of time in fiction](#)
  - [How to use LLMs for Text Analysis](#)
  - [AI for LAM](#)
  - [ParrotGPT: On the Advantages of Large Language Models Tools for Academic Metadata Schema Mapping](#)
  - [Generative History](#)
- LLMs and Coding:
  - [Six tips for better coding with ChatGPT](#)
  - [It is starting to get strange](#)
  - [Pairing with GPT-4](#)
- LLMs and Security
  - [Prompt injection explained, with video, slides, and a transcript](#)
  - [Prompt injection: What’s the worst that can happen?](#)
  - [AI Incident Database](#)
  - [Three ways AI chatbots are a security disaster](#)
  - [ChatGPT Is Ingesting Corporate Secrets](#)
- LLMs and Labour
  - [‘Overemployed’Hustlers Exploit ChatGPT To Take On Even More Full-Time Jobs](#)



- LLM Hallucinations
  - ChatGPT is defaming me and it must be someone's fault
  - Defamed by ChatGPT: My Own Bizarre Experience with Artificiality of "Artificial Intelligence"
  - Why ChatGPT and Bing Chat are so good at making things up
- LLMs and the Law
  - Italy's new rules for ChatGPT could become a template for the rest of the EU
- Optimism:
  - Now is the time for grimoires It isn't data that will unlock AI, it is human expertise
  - 35 Ways Real People Are Using A.I. Right Now
  - ChatGPT is Good at Roleplaying Characters
  - The Anatomy of Autonomy: Why Agents are the next AI Killer App after ChatGPT
- LLMs Environmental Impact:
  - ChatGPT Is Consuming a Staggering Amount of Water
- Evaluations and Critiques:
  - AI hype is built on high test scores. Those tests are flawed
  - The Waluigi Effect (mega-post)
  - Why is GPT-3 15.77x more expensive for certain languages?
  - Textpocalypse: A Literary Scholar Eyes the "Grey Goo" of AI
  - OpenAI discontinues its AI writing detector due to "low rate of accuracy"
  - The uselessness of AI ethics
  - What We Still Don't Know About How A.I. Is Trained
  - OpenAI isn't doing enough to make ChatGPT's limitations clear
  - GPT-4 and professional benchmarks: the wrong answer to the wrong question
- Stochastic Parrots and Related Debates on AI Intelligence:
  - On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?
  - You Are Not a Parrot
  - Language Is a Poor Heuristic For Intelligence
  - On Accidental and Parasitic Language
  - AI, like Jon Snow, knows nothing
  - ChatGPT - The Revolutionary Bullshit Parrot
  - Mystery AI Hype Theater 3000
  - And Yet It Understands
  - The Unpredictable Abilities Emerging From Large AI Models
  - Caricaturing Noam Chomsky
  - Noam Chomsky: The False Promise of ChatGPT
- AI Apocalypse Debates
  - The Open Letter to Stop 'Dangerous' AI Race Is a Huge Mess
  - The Call to Halt 'Dangerous' AI Research Ignores a Simple Truth
  - Let's think about slowing down AI
  - The Anti-Fascist Approach to AI
  - Pausing AI Developments Isn't Enough. We Need to Shut it All Down
  - Keep your AI claims in check
  - Eighteen pitfalls to beware of in AI journalism
  - The AI Scaling Hypothesis
  - "Ensuring Safe, Secure, and Trustworthy AI": What those seven companies avoided committing to
- Guides and Tutorials:
  - OpenAI Prompting Guide
  - Learn Prompting
  - Making Large Language Models work for you
  - How I make annotated presentations

- Explaining Transformers and LLMs
  - Large language models, explained with a minimum of math and jargon
  - A Very Gentle Introduction to Large Language Models without the Hype
  - Think of language models like ChatGPT as a “calculator for words”
  - Watch an A.I. Learn to Write
  - Transformers from Scratch
  - ChatGPT Explained: A Normie’s Guide To How It Works
  - Understanding ChatGPT
  - Simply explained: how does GPT work?
  - Understanding Large Language Models: A Cross-Section of the Most Relevant Literature To Get Up to Speed
  - Attention Is All You Need - Key article on transformer technology
- Other
  - Surprising things happen when you put 25 AI agents together in an RPG town
  - Teaching ChatGPT to Speak my Son’s Invented Language
- Reference
  - AI & Large Language Models (LLMs) reading list (Articles, Blogs, Threads, Videos)
  - What Are Transformer Models and How Do They Work?
  - Towards a Bibliography for AI Systems

## Week 8 - Introduction to R

This week we’ll talk about R, which, together with the programming language Python are the two most commonly used programming languages for digital humanities, statistics, machine learning, and the whole world of data science. Although I personally enjoy Python more, and it is a more versatile programming language used in a wide range of tasks, my experience been that the welcoming environment of R Studio and the ease of adding and making use of libraries seems to be slightly better for new beginners. Anything in the module that can be done with R can be done with Python.

### Preparation:

1. Attempt to download and install [R](#) and the free [R Studio Desktop OpenSource License](#).
2. If you are able, try to follow along in R as you read Jockers and Silge down below.

### Required Reading

- JOCKERS [Ebook](#)
  - Ch 1 R Basics
- SILGE [Online](#)
  - Ch 1 The Tidy Text Format
  - See Konrad’s additional explanations and examples related to Chapter 1: [Notes on Text Mining with R](#)

### Further Reading

- Cotton, Richard *Learning R* O’Reilly (2013) - if you are thinking of doing your project with R, I would suggest buying yourself a copy of this for reference
- Wickham, Hadley et al *R for Data Science* O’Reilly (2017) - another book you might consider owning
- Davies, Tilman M. *The Book of R: A First Course in Programming and Statistics*

## Week 9 - Text Analysis: Frequencies, Correlations, and Sentiment Analysis

This week we will focus on some of the basic tasks carried out in text analysis: breaking texts down into tokens, getting frequencies for these in a text, and exploring correlations. You will *not* be required to use R in your final project, but take this opportunity to acquaint yourself with some of the basics of R and some of the ways it can be used. While here we use it for text analysis, it can also be used for regular expression search, GIS, network analysis and visualization, and many other useful tasks.

### Preparation:

1. The technical readings this week will reproduce some of what we try in class so don't worry if you can't make it through everything. We'll step through some of this within class. To take a break from R, download a raw text file from one of the books at [Project Gutenberg](#) and input it, or a piece of it, into [Voyant Tools](#), which does some of the basic tasks that we are learning to do by other means.
2. Attempt to follow along with SILGE , Ch 3 Analyzing Word and Document Frequency: tf-idf, Ch 4 Relationships Between Words: N-grams and Correlations (up to p54 where network visualization begins)
3. The required reading below includes SILGE and/or JOCKERS reading - try to follow along the code in RStudio and take note of problems encountered along the way.

### Required Reading

- [SILGE Online](#)
  - Ch 2 Sentiment Analysis with Tidy Data
  - Ch 3 Analyzing Word and Document Frequency: tf-idf
  - Ch 4 Relationships Between Words: N-grams and Correlations (up to p54 where network visualization begins)
  - If you struggle with SILGE, which uses a new convenient package and tidytext approach, but offers less in the way of explanation in the book, you can, alternatively, try: JOCKERS Ch 2-5 [Ebook](#)

[Do Digital Humanists Need to Understand Algorithms?](#) Ben Schmidt in *Debates in Digital Humanities*

[The Foreign Language of 'Mad Men'](#)

Read One of the Following:

- A) Underwood, Ted *Distant Horizons : Digital Evidence and Literary Change* Preface, Ch 1-2. [Library ebook](#)
- B) Ramsay, Stephen *Reading Machines: Toward an Algorithmic Criticism* University of Illinois Press (2011) Ch 1 An Algorithmic Criticism pp1-17 Ch 5 Patacomputing pp69-81 [Library ebook](#)

### Further Reading

[Textual Analysis](#) introduction by David Hoover

[Text Analysis, Data Mining, and Visualizations in Literary Scholarship](#)

[Alien Reading: Text Mining, Language Standardization, and the Humanities](#) Jeffrey Binder in *Debates in Digital Humanities*

[Mad Men anachronism hunting](#)

[Making Downton more traditional](#)

Weiss, Sholom M., Nitin Indurkha, Tong Zhang, and Fred J. Damerau. *Text Mining: Predictive Methods for Analyzing Unstructured Information*. New York: Springer, 2005.

Daniel Rosenberg, "Data before the Fact" from "*Raw Data*" is an Oxymoron, ed. Lisa Gitelman (MIT Press, 2013)

Rockwell, Geoffrey. "What Is Text Analysis, Really?" *Literary and Linguistic Computing* 18, no. 2 (June 1, 2003): 209–19. <https://doi.org/10.1093/llc/18.2.209>.

[Text Data Preparation: a Practice in R using the Sheng Xuanhuai Collection](#) - example of tackling the problem of segmenting Chinese text using [jiebaR](#) package and then [quanteda](#) for analysing the text.

### **Reference Reading**

[Google Ngrams](#) [Culturomics](#) [Hathi Trust Digital Library](#)

## Week 10 Surveying the Text Analysis Landscape

### Preparation

1. If you didn't make it through SILGE or JOCKERS chapters, consider using some of your time for play and exploration to continue these, or else try the same tools with some of your own data. When you struggle to understand code, consider using an LLM to have it explain the code to you line by line, or ask it to modify the code in ways you find useful and see if it produces code that functions.
2. This week we will give each of you a chance to introduce your ideas for your final project or essay. What have you learned so far? What challenges have you encountered?
3. Revisit the journals on p10 in the "Resources to Explore" section. Choose one of these journals, find one article that employs a text analysis approach to an empirical case in the past (doesn't have to be overtly historical but at least set in our past). Come ready to introduce the article.
4. We will discuss together some of the obstacles to using these approaches with use of historical sources, synthesizing our discussion and reading in the past few weeks.

### Required Reading

- If text analysis is your main interest among our skills, consider exploring topic modeling. Using Voyant Tools, I will show you a very basic example in class. Much of the good material online related to it ages quickly with tools and tutorials not always working fully, but I have listed some resources below you can explore:
  - Try going through SILGE Ch 6 Topic Modelling and or JOCKERS Ch 12 Topic Modeling
  - [Getting Started with Topic Modeling and MALLET](#) (2012) - this tutorial runs MALLET directly from command line
  - [Words Alone: Dismantling Topic Models in the Humanities](#) (2012) Benjamin M. Schmidt
  - [When you have a MALLET, everything looks like a nail](#) (2012) Benjamin M. Schmidt
  - "The interpretation of topic models for scholarly analysis: An evaluation and critique of current practice" *Digital Scholarship in the Humanities* (2023) [DOI](#)
  - [U Penn Tutorial for Basic Topic Modeling Voyant Tools](#)
  - [Probabilistic Topic Models](#) David M. Blei *Communications of the ACM* (2012)
  - [The LDA Buffet is now Open](#) (2011)
- [Text Analysis: What Can You Do? A Survey With Readings](#) - Browse this list of approaches. For each approach, a book and some page numbers are given. Most of these books are in the library and many are available as ebooks. Choose one or two technique and read the pages from the resources mentioned, without worrying too much if you don't fully understand the text. Think about how this technique might be useful to historians. The list of books referred to in each section is available at the bottom of the page but also again in the further reading below. Come prepared to introduce what you have learned and potential applications for historians.

### Further Reading

- Taylor Arnold and Lauren Tilton *Humanities Data in R* [Ebook](#)
- Matthew L. Jockers *Text Analysis with R for Students of Literature* [Ebook](#)
- Ted Kwartler *Text Mining in Practice with R* [Hard copy](#)
- Julia Silge & David Robinson *Text Mining with R* [Online](#)
- Benjamin Bengfort, Rebeccas Bilbro, and Tony Ojeda *Applied Text Analysis with Python*
- Geoffrey Rockwell and Stéfan Sinclair *Hermeneutica*
- Gregor Wiedemann *Text Mining for Qualitative Data Analysis in the Social Sciences* [Ebook](#)
- Taeho Jo *Text Mining: Concepts, Implementation, and Big Data Challenge* [Ebook](#)
- Guillaume Desagulier *Corpus Linguistics and Statistics with R* [Ebook](#)
- Anatol Stefanowitsch *Corpus Linguistics: A Guide to the Methodology* [Ebook](#)
- Jacques Savoy *Machine Learning Methods for Stylometry* [Ebook](#)
- Barbara McGillivray and Gábor Mihály Tóth *Applying Language Technology in Humanities Research* [Ebook](#)
- Natalia Levshina *How to do Linguistics with R* [Ebook](#)
- Stephen Ramsay *Reading Machines* [Ebook](#)

- Andrew Piper *Enumerations: Data and Literary Study* [Ebook](#)
- Ted Underwood *Distant Horizons* [Ebook](#)

Other reading:

[Language is Biased. What Should Engineers Do?](#) Ben Schmidt

[Odd Numbers: Algorithms Alone Can't Meaningfully Hold Other Algorithms Accountable](#) Frank Pasquale

[The Hermeneutics of Data and Historical Writing](#)

[Discovery and Justification are Different: Notes on Science-ing the Humanities](#)

[Vector Space Models in the Digital Humanities and Rejecting the gender binary: a vector-space operation](#) - Ben Schmidt

[The Ground Truth of DH Text Mining](#) Tanya E. Clement

[Problems with the Syuzhet Package](#) Annie Safford

[Mining the \*Dispatch\* project](#)

[Text Mining: An Annotated Bibliography](#)

[Bibliography on Topic Modeling](#) by David Mimno

[The Hermeneutics of Data and Historical Writing](#)

[Discovery and Justification are Different: Notes on Science-ing the Humanities](#)

[Vector Space Models in the Digital Humanities and Rejecting the gender binary: a vector-space operation](#) - Ben Schmidt

[Doing Digital History with Python III: topic modelling with Gensim, spaCy, NLTK and SciKit learn](#) - Using python instead of R.

[Text Mining: An Annotated Bibliography](#)

[Bibliography on Topic Modeling](#) by David Mimno

## Week 11 - Networks: Introduction to Social Network Analysis and Gephi

At one level the study of historical networks and relationships between people is at the heart of the sub-field of “prosopography” which we will examine more closely today. The heart of prosopography work has often been the work of developing a good database, which unfortunately is not something we will have time for here. We’ll examine some examples, however, of prosopography projects and think about how social network analysis can be put to good use in historical work.

### Preparation

1. Please visit and look over the following websites:

[Prosopography Research](#)

[Domesday - Prosopography of Anglo-Saxon England.](#)

[Prosopography of the Byzantine World](#)

[China Biographical Database Project](#)

2. Please try to install [Gephi](#) on your laptop and look over some of these [sample datasets](#). Gephi is the software we will explore in class. Please note that Gephi uses R. In case you feel more comfortable using Python, consider also installing and exploring [Cytoscape](#).

### Reading

[“Demystifying Networks”](#) Scott Weingart

- SCOTT 4th edition (see Files for a rough scan)
  - Ch 1 What is Social Network Analysis
  - Ch 5 Terminology for Network Analysis
  - Ch 6 Popularity, Mediation and Exclusion

(If you have 3rd edition of Scott then read instead: Ch 1 Networks and Relations, 4 Lines, Neighborhoods and Densities, 5 Centrality, Peripherality and Centralization instead)

### Further Reading

See Konrad's [DH Tutorials - Visualising Social Networks with Cytoscape](#) page, including a list of terms, organisations, projects, tutorial links, and some articles.

Consider reading more of SCOTT

Robert A. Hanneman and Mark Riddle [Introduction to social network methods](#) Online textbook

Miriam Posner's [Glossary of Social Network Analysis](#)

Peter Bol "[GIS, Prosopography, and History](#)"

Folsom, Ed. "Database as Genre: The Epic Transformation of the Archives" *PMLA* Vol. 122 No 5 Oct 2007, 1571-1579.

Lev Manovich [Database as a Symbolic Form](#)

The following SAGE handbook has sometimes very technical chapters but is especially valuable for anyone interested in using network analysis in their final project given its rich bibliographies for each sub-topic. Can be a great starting place for exploring the range of scholarship on networks of particular kinds and applied to particular themes:

- Scott, John, and Peter J. Carrington, eds. *The SAGE Handbook of Social Network Analysis*. (2011)
  - Ch 2 Social Network Analysis: An Introduction pp11-25
  - Ch 4 Network Theory pp40-54
  - Ch 23 A Brief Introduction to Analysing Social Network Data pp331-339
  - Ch 24 Concepts and Measures for Basic Network Analysis pp340-369
  - Ch 27 Qualitative Approaches pp404-416
  - Ch 28 Analyzing Affiliation Networks pp417-433
  - Ch 29 Positions and Roles pp434-446
  - Ch 8 Personal Communities: The World According to Me pp101-115
  - Ch 13 Corporate Elites and Intercompany Networks pp180-195
  - Ch 14 Political Dimensions of Corporate Connections pp196-209
  - Ch 15 Policy Networks pp210-222
  - Ch 16 Social Movements and Collective Action pp223-235
  - Ch 17 Crime and Social Network Analysis 236-255
  - Ch 19 Scientific and Scholarly Networks 271-285

Also useful for anyone wanting to explore more advanced topics with SNA, the following book is a classic core text in the field and covers many of the details of the quantitative foundations of the field:

Wasserman, Stanley, and Katherine Faust. *Social Network Analysis: Methods and Applications*. Cambridge University Press, 1994.

### Examples of Research on Networks

Lindner, Ulrike. "Transnational Movements between Colonial Empires: Migrant Workers from the British Cape Colony in the German Diamond Town of Lüderitzbucht." *European Review of History: Revue Européenne D'histoire* 16, no. 5 (2009): 679–95.

David S. Lux and Harold J. Cook, 'Closed Circles or Open Networks? Communicating at a distance during the scientific revolution', *History of Science* 36 (1998): 179-211.

James Secord, 'Knowledge in Transit', *Isis* 95 (2004): 654-672

Rodogno, Davide, Bernhard Struck, and Jakob Vogel, eds. *Shaping the Transnational Sphere: Experts, Networks and Issues from the 1840s to the 1930s*. New York: Berghahn Books, 2014. (Introduction)

Jasanoff, Maya. *Liberty's Exiles: How the Loss of America Made the British Empire*. London: HarperPress, 2011.

John Law, 'On the methods of long-distance control: vessels, navigation and the Portuguese route to India', in John Law (ed.), *Power, Action and Belief. A New Sociology of Knowledge?* (London, 1986), pp. 234-263. Not in library, but available to download [here](#)

David Livingstone, *Putting Science in its Place: Geographies of Scientific Knowledge* (Chicago, 2003), Chapter 1 'A Geography of Science?' and Chapter 4 'Circulation: Movements of Science'.

Bruno Latour, 'The Powers of Association', in John Law (ed.), *Power, Action and Belief. A New Sociology of Knowledge?* (London, 1986), pp. 264-280.

Pierre-Yves Saunier, 'Circulations, connexions et espaces transnationaux', *Genèses* 57 (2004), 110-126

### [Historical Network Research - Bibliography](#)

**If you are interested in Social Network Analysis and want to explore this more:**

#### Reading

LUKE Ch 2-3 pp11-41

Consider reading on in LUKE to find more about network visualization design and some of the possibilities for more advanced analysis.

Wetherell, Charles. "Historical Social Network Analysis." *International Review of Social History* 43, no. Supplement S6 (December 1998): 125–44. doi:10.1017/S0020859000115123.

Lemercier, Claire. "[Formal Network Methods in History: Why and How?](#)," December 7, 2011.

[If Everything is a Network, Nothing is a Network](#) Mushon Zer-Aviv

Erickson, Bonnie H. "Social Networks and History: A Review Essay." *Historical Methods: A Journal of Quantitative and Interdisciplinary History* 30, no. 3 (January 1, 1997): 149–57.

More from Scott Weingart Series on Demystifying Networks:

[DN2 Degree](#), [DN3 Power Law Rant](#), [DN4 Co-Citation Analysis](#), [DN5 Communities](#), [PageRank](#), and [Sampling Caveats](#), [DN7 Doing Co-Citation Analysis](#), [DN8 When Networks are Inappropriate](#), [DN9 Bimodal Networks](#) - (Note: The links now seem dead, explore via [archive.org](#) web archive)

### Attributions

This handbook takes ideas for readings and tasks from many of the works listed above in the readings and further readings. It also used material found in the blogs, syllabi and modules of other scholars out there including:

- the QGIS videos of [Eric Brelsford](#)



- the QGIS videos [Lex Berman](#) and the [Harvard CGA](#)
- many links and ideas from the members of the Spatial Community and the Digital Humanities Slack groups
- the various courses taught by [David Mimno](#)
- Courses and pages of [David J. Birnbaum](#)
- Seminar by [Matt Wilkens](#)
- Courses and links of [Mark Sample](#)
- Courses and blog entries of [Lincoln Mullen](#)
- Courses and writing of [Ryan Cordell](#)
- Writings of [William Turkel](#)
- Tutorials of [Programming Historian](#)
- Various postings by authors on [ProfHacker](#)
- Useful ideas and suggestions from [Antonis Hadjikyriacou](#)
- This is far from a complete list...