Overview of GIS Tools for Digital Humanities

Major mapping project software

Many digital humanities projects use maps to discover or reveal features of the material being studied. A collection of materials might be mapped according to where the works were produced, or the locations described in a piece of literature. Different categories of information may appear together on the same map, color-coded to reveal clusters of related occurrences over time. Unlike printed maps, digital maps offer the opportunity for interaction – panning and zooming to navigate the map, clicking items to reveal more information in a "tool tip", or showing/hiding facets of information according to the user's desires. Mapping is most easily accomplished using freely available online maps of the contemporary world (e.g. Google Maps, Open Maps, etc.), but the scholar is not limited to views of the modern world. A growing body of historical maps are available for connecting to geographic information systems (GIS).

Your mapped data can come from several places. Various GIS products can place map points based on street addresses, zip codes, latitude/longitude, or other designations. You may have a spreadsheet of entries, with columns for different data features including mappable points (e.g. name: Virginia Woolf; image_url: https://tinyurl.com/vwimg; latitude: 50.8387; longitude: 0.0165). You can use GIS software to add or draw points, lines, or shapes directly into a map. You can import paths from phone apps such as MapMyRun or AllTrails. You can also work with a wide array of pre-existing data compiled by others, including all of the types of data mention above. Any or all of these may be brought imported into or created directly in mapping project software, depending on the software's features.

Often, GIS software will support multiple "layers" of data, akin to visual layers in Photoshop, where each layer can be visible or invisible at the user's discretion, allowing the user to select what kinds of information to see. For example, if you were studying interdisciplinary connections in eighteenth-century Vienna, you might have one data layer representing the homes of composers, another for poets, another for philosophers, one for arts patrons, and another for coffee houses. Turning layers on and off can help the user focus on particular co-locations of interest without cluttering the field with extraneous information.

The following are some common software packages used for digital humanities projects. The final page offers a comparison of features from these software packages.

ArcGIS Online - http://www.arcgis.com

The Cadillac of mapping software, including online and desktop mapping tools. Requires a monthly subscription after a three week trial. Their smart-mapping features make it relatively easy to create meaningful, high-quality maps from large data sets. Automatic detection of city-and-state type information makes it easy to use whatever geo-data your data comes in. The Living Atlas feature makes it simple to include map layers reflecting pre-existing datasets such as age demographics, media income levels, poverty rates, elevation, wildfire hazard, soil erosion and myriad other factors. Can be shared as a map embedded in a web page with varying degrees of user controls. Tooltips may include any or all of the information in a table row, as well as charts generated from that information.

QGIS - https://www.qgis.org/en/site/

Free, open-source desktop software (Win, MacOS, Linux) - high-powered GIS software akin to the desktop version of ArcGIS, but not the simplicity of the web-based smart-mapping ArcGIS. This will have a steeper learning curve. There are no built-in base maps, but can include open maps from the internet (including Google and other sources), and a simple plugin makes it easy to import historical base maps. There are quite a lot of YouTube tutorials for specific operations. Although some of the base-level functionality can be limited, there are a lot of plugins to extend the functionality. For example, the program does not natively export dynamic content for the web, but the qgis2web plugin allows you to export maps as web dynamic web-pages, though they are not as slick as the ArcGIS Online maps.

Tableau Public - https://public.tableau.com/

Desktop software with a connection to a web-based host, suitable for sharing the files you create. This is the limited free version of a more expensive piece of software. Tableau does best with very numeric data; if you want to map the number of records that relate to a specific city or state, it can generate dots on maps or color-coded states (e.g. by number of records pertaining to a state). Does not appear to support multiple data layers, though it can create multiple visualizations from the same data set. Often used for business data, a tutorial aimed at DH workers could be helpful: http://www.kristenmapes.com/tableau/

Palladio – http://palladio.designhumanities.org

Palladio is a data-exploration tool more than it is a tool for presenting interactive results, and mapping is only part of what it does. It is also capable of presenting timelines, image galleries, and relationship-networks and exploring the same data with all three tools. It does a good job of mapping large tables of data (e.g. museum or archive item entries) and revealing spatial patterns in the data by categorizing mapped points according to metadata included in the dataset (for instance, a row of data might include the subject or genre of various events or images depicted and organize them by different colored markers on the map. This tutorial gives a good sense of its capabilities: http://miriamposner.com/blog/getting-st

Map-A-List – http://mapalist.com

Map-A-List is extremely simple: it will take a table of information from a Google Docs spreadsheet and create a Google Map using the locations given in one field of the sheet. It has very few features: it can create a map with one pin per entry, clusters of pins to show density in particular areas, or heat maps showing the density of pins. Limited to 2500 spreadsheet rows.

WorldMap - https://worldmap.harvard.edu

This appears to be powerful online mapping software that could rival ArcGIS online someday, but perhaps not soon. Designed with research teams and public reporting of information in mind, it has a lot of powerful features and the most customizable settings to control who can view and edit a project. Unfortunately, I have thus-far also been entirely unable to make anything work.

Other mapping tools

The tools in the previous section were aimed at full-scale data exploration and presentation. But the world of GIS is full of tools targeting more specific needs, and they will often support the work that goes on in the larger tools. GIS has a lot of file-formats, and many tools only accept certain kinds of input, and create only certain kinds of output. Some of these tools can convert data from one format into others.

Others can help you turn non-GIS files (such as scanned maps or aerial photos) into layers that can connect with geographic data by attaching latitude/longitude information to your image files.

GeoJSON.io - http://geojson.io – this is a bit of a Swiss Army Knife for geographic information, importing a wide variety of file formats into its map, letting the user add points, lines, and polygons by hand, and exporting data into another wide variety of formats. It is both a converter and a creation tool. Can be used in conjunction with historical base maps from MapWarper (below).

MyGeodata Converter - https://mygeodata.cloud/converter/ – another data conversion tool; just upload a file to convert, and download the resulting output. They also have some online mapping tools that I've not explored.

MapWarper – http://mapwarper.net – convert scanned maps or aerial photos into "georectified" images by identifying points on the map that correlate to known GIS coordinates. You don't have to know the coordinates – you can select them from a Google-style street map or other online map. The "warping" part refers to the automated process of adjusting for differences in the map projection. Georeferencer – http://www.georeferencer.com is very similar.

David Rumsey Map Collection - https://www.davidrumsey.com/view/georeferenced-maps - over 24,000 georeferenced maps from around the world.

MapKnitter – https://mapknitter.org – Georectified maps, such as those produced by MapWarper (above) can be stitched together to create larger maps. Especially useful for aerial photos.

Note: please see the feature comparison for GIS software on the next page!

Features of GIS Software for Digital Humanities

	ArcGIS Online	QGIS Desktop	Tableau Public	Palladio	Map-a-List	WorldMap (Harvard)
Account Features						
Free	N	Y	Y	Y	Y	Y
Paid = more features	N	N	Y	N	N	N
Web-based	Y	N	N	Y	Y	Y
Privacy						
Maps may be viewable by public	Y	N/A	Y	N	Y	Y
Custom privacy controls	N	N/A	N	N	N	Y
Adding GeoData						
Import CSV data	Y	Y	Y	Y	Y	?
Import GeoJSON	Y	Y	Y	Y	N	?
location from coordinates	Y	Y	Y	Y	Y	?
location from city/state	Y	Y	Y	N	Y	?
location from shapefiles (SHP/SHX)	Y	Y	Y	N	N	Y
Import paths from route-tracking apps	Y	Y	N	N	N	N
Add polygons by hand	Y	Y	N	N	N	Y
Map Features						
Supports multiple data layers	Y	Y	?	N	N	Y
Demographic Layers Built in	Y	N	Y	N	N	N
Science layers Built In	Y	N	N	N	N	N
Variety of Open Layers	Y	Y	N	N	N	Y
Historical/georeferenced map layers	Y	Y	N	Y	N	Y
Lightly customizable tooltips	Y	Y	Y	Y	Y	Y
Highly customizable tooltips	Y	Y	?	N	N	Y

	ArcGIS Online	QGIS Desktop	Tableau Public	Palladio	Map-a-List	WorldMap (Harvard)
Web Export						
Toggle layer visibility	Y	Y	?	N/A	N/A	Y
Zoom	Y	Y	Y	N	Y	Y
Embeddable HTML code	Y	N	Y	N	Y	Y
Embed without paid account	N	N/A	Y	N/A	Y	Y
Printing						
Printable	Y	Y	N	N	Y	Y
Printing is easy	N	N	N/A	N/A	Y	Y
Exporting Data						
GeoJSON	Y	Y	?	N	N	?
Shapefiles	Y	Y	?	N	N	?
Usability/Learning Curve						
Easy to start	Y	N	~	~	Y	N
Lots to learn	Y	Y	Y	Y	N	Y
Smooth/bug-free	Y	~	Y	N	Y	N