ArcGIS

Launched by the GIS corporation Esri in 2000, ArcGIS is the leading commercially-available GIS desktop application. It is widely used in industrial settings, including urban planning and geosciences; it has also gained traction as a tool for quantitative social science. For these reasons, it has been adopted as a spatial analysis tool by digital humanists, especially those whose research contains a heavy quantitative component.

ArcGIS operates on two platforms: ArcGIS Desktop, which offers a high level of customizability and geoprocessing capabilities; and ArcGIS Online, which displays map data on the web. ArcGIS Online maps can be embedded, and contain a few interactive features, such as tooltip information boxes and layer visibility manipulation.

Example Applications

The majority of existing digital humanities research utilizing ArcGIS has been in the fields of quantitative history and historical sociology. The University of Richmond’s Voting America is a typical example, aggregating electoral results and census data for the United States from 1840 through 2008. The maps produced for this project are visually communicative but static; change over time is conveyed through linear-progressive time lapse videos rather than interactive features. This project avails itself of ArcGIS’s visualization capabilities in processing and communicating quantitative data, but its modest interactive features had to be added outside of ArcGIS, e.g. through video creation and processing.

Digital Humanities Potential

ArcGIS is best implemented as a tool for processing data and producing output. It is best suited for digital humanities projects with a strong quantitative element, in which humanist inquiry is augmented by geographical distributions or statistical analysis. While this tool’s natural inclination is toward sharp boundaries and dividing lines, its data processing capabilities are flexible enough that a researcher could foreground borderlands and overlapping boundaries as long as the appropriate data was available. ArcGIS would be most hospitable to digital humanities scholarship focusing on static spatial-temporal point values, data distributions, and temporal shifts within geographic boundaries. This tool could be used effectively for studies of military history, geographic movements of linguistic phenomena, or the movements of cultures in diaspora.

The program’s intended use for industrial applications limits its hospitality to some humanist concerns, such as pluralism, ambiguity, and interactivity. By default, ArcGIS conceals its data sources and does not facilitate attributions of authorship, and it is thus unsuitable for projects which need to emphasize multiple individuated voices. Similarly, the singular and relatively anonymous nature of map authorship runs the risk of presenting the map as an authoritative and objective truth rather than a human construct. The interactive features of ArcGIS are fairly rudimentary; it does facilitate the integration of informational pop-up boxes and outbound hyperlinks, but it truly shines as an engine for data visualization rather than as a platform for pedagogical interaction.

ArcGIS is ideal for projects with high quantitative data processing needs and minimal text or image display requirements. It is less suitable for projects which seek a dialogic and interactive relationship with the user, or for those which need to present a plurality and/or ambiguity of authorial voice.

Advantages

ArcGIS’s greatest virtue is its flexibility. With proper georeferencing and data formatting, it can display virtually any kind of data. Geospatial data can be processed in a wide variety of ways—combining shapefiles, excising or foregrounding areas of overlap, counting data points within a given coverage zone, etc.—and the options for visual customization are all but limitless. ArcGIS is highly hospitable to temporal-spatial data, though this data is displayed in animations rather than in a timeline function (no such function is native to the program). If properly customized, the maps produced by the desktop application can be attractive, elegant, and legible. And, due to ArcGIS’s ubiquity, there is a good chance of a digital humanities scholar’s home institution already holding a license.

Drawbacks

Name: ArcGIS

Governing Body: Esri (for-profit corporation)

Price: $1,500 (basic), $7,000 (standard)

Difficulty Level: 4 (Advanced)

Best Disciplinary Fit:

- political, demographic,
- linguistic, or military history
- historical epidemiology
- archaeology

Website: http://www.arcgis.com
While the computing power of ArcGIS is immense, so is its cost—a bare-bones Basic edition will run $1000, while the Standard edition costs $7000. These costs are easier to justify in extractive industries, urban planning, and other settings where the tool is likely to be used to its full capacity and integrated deeply into operational workflow. For the humanities researcher, however, the monetary cost—and the relative complexity of ArcGIS compared to other mapping and GIS technologies—is likely to outstrip the tool’s usefulness.

ArcGIS also relies heavily on proprietary Esri technologies, for instance the ArcCatalog program for the management of proprietary .gdb file geodatabases. For this reason, it can be very difficult to transport data from ArcGIS to other GIS and mapping applications. This hinders collaboration across disciplines and institutions, a serious concern for collaborative projects in digital humanities.

Finally, ArcGIS suffers from some technical drawbacks. Due to its significant demands on RAM, the desktop application has some stability issues, including a tendency to freeze and a temporary intermittent failure to process or display all data. Embedding of an ArcGIS Desktop map is impossible—the data must be ported to ArcGIS Online, and the resulting maps are inelegant and difficult to customize compared to their desktop counterparts. And its requirement of an up-to-date, Windows-based operating system may add to a project’s technology costs.

**External Links**

- ArcGIS for Desktop
- ArcGIS Online