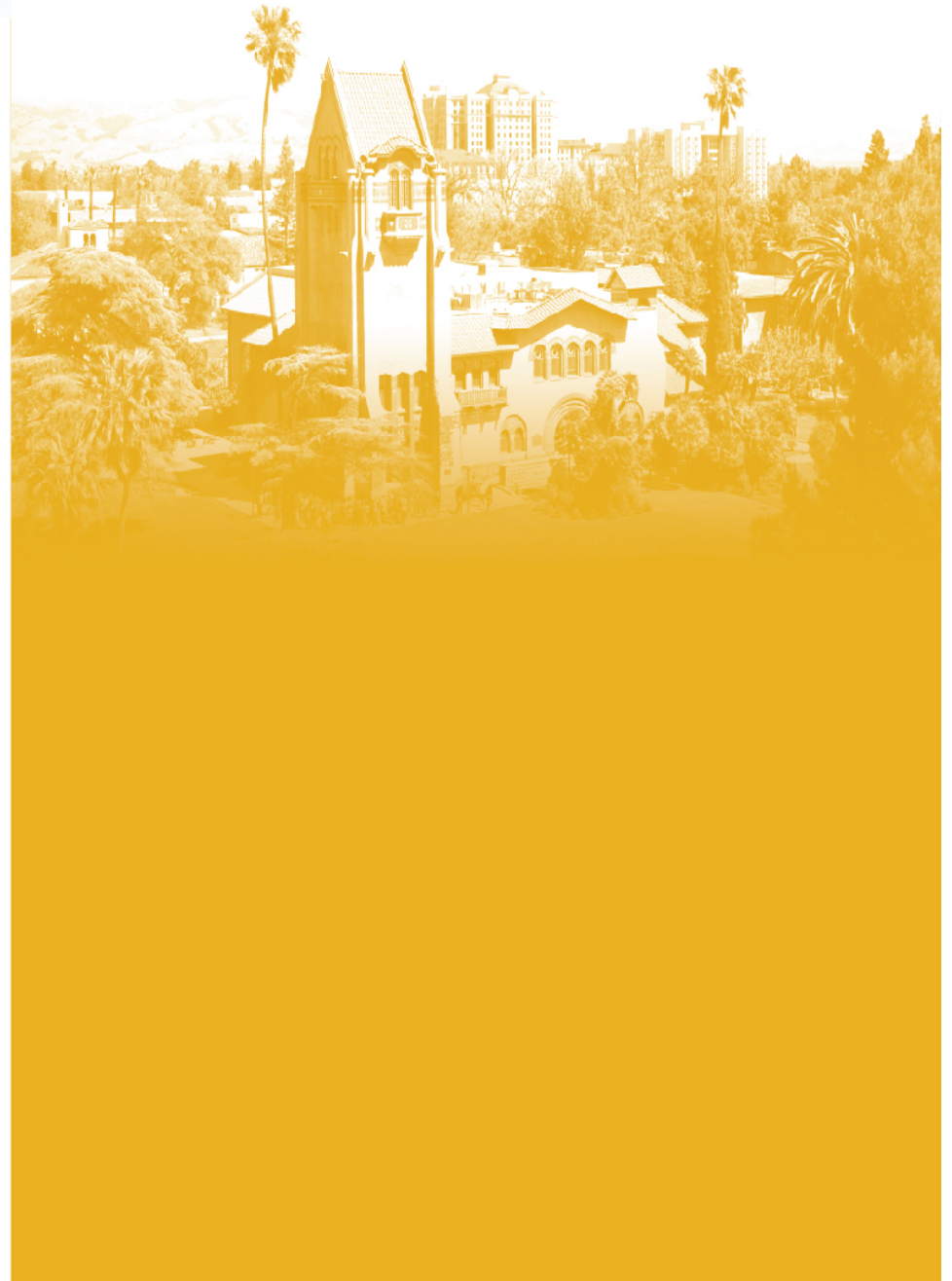


*2017 California Conference on Library  
Instruction*

**Information Visualization  
Skills for Academic  
Librarians: A Content  
Analysis of Publications and  
Online Resources in the  
Digital Humanities**

Dr. Michelle Chen  
May 5<sup>th</sup>, 2017

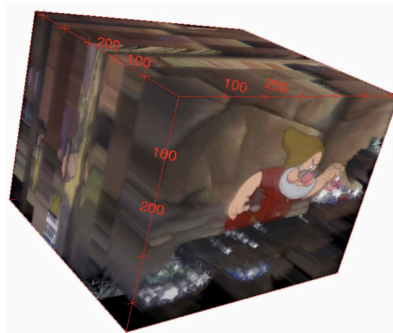


# Agenda

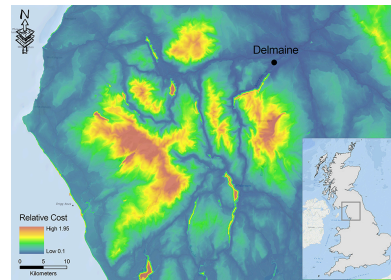
- Overview
- Literature review
- Methodology
- Results
- Discussions
- Demo

# Overview

- Digital humanities: data has become more voluminous, versatile, accessible and digitized
- Examples:



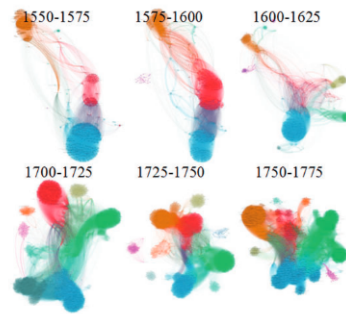
Ferguson, 2017



Murrieta-Flores et al., 2017



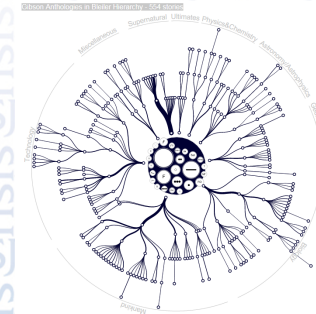
Bradley et al., 2016



Suarez et al., 2013



Tzankova & Schiphorst, 2010



Forlini et al., 2016

## Overview (cont.)

- Research methods in digital humanities ([http://www.library.illinois.edu/sc/services/Digital\\_Humanities/Research\\_Methods.html](http://www.library.illinois.edu/sc/services/Digital_Humanities/Research_Methods.html))
  - Data curation
  - Digital publishing
  - Image analysis
  - Text encoding
  - Machine learning
  - **Data visualization**
  - Geospatial information systems
  - Text mining
  - ...

## Overview (cont.)

- Data/Information Visualization
  - The technique of creating “2- or 3-dimensional representations of data that enable new discoveries of insights and knowledge” (Soukup & Davidson, 2002)
  - Unique capabilities for...
    - Pattern recognition
    - Outlier detection
    - Knowledge/insight discovery



## Overview (cont.)

- Information Visualization and Digital Humanities
  - Information visualization can be used to analyze metadata, tags, texts, images, or any type of digital information in humanities works
  - Information visualization has been considered as one of the core skills for librarians to support research in various disciplines
  - How about using information visualization in digital humanities research?



## Overview (cont.)

- Research questions
  - *Q1: What are the main tools, application types, and purposes of information visualization in digital humanities research?*
  - *Q2: What types of online resources are provided by academic libraries that focus on applying information visualization to digital humanities research?*
  - *Q3: Is there a gap between the practical use of information visualization in digital humanities research and the support and services provided by academic librarians? And if so, how can academic librarians prepare best?*

# Literature Review

- Information visualization used in the digital humanities
  - screenplay parsing (Hoyt et al. 2014)
  - religion symbol analysis (Tzankova & Schiphorst 2010)
  - history understanding (Forlini et al. 2016; Suarez et al. 2013)
  - web-information visualization (Breure et al. 2014; Lynch 2014)
- Information visualization discussed in the LIS community
  - a core skill and focus area to be incorporated into information literacy (Womack 2014; Roff 2011)
  - a tool for teaching research skills (Huff 2007)
  - a practice to create a meaningful visual storytelling experience (Magnuson 2016)
- The research gap...?



# Methodology

- Content analysis of...
  - five years of recognized journals in DH
  - online resources provided by academic libraries in support of DH research and practices
- Compare tools, applications types, and purpose of IV use in DH research



## Data: DH Journals

- Selecting DH journals
  - peer-reviewed, reached a wide audience, and fully accessible through my university library subscriptions
- Using supporting resources
  - *Resource Guide* provided by Digital Humanities at Berkeley, *The Digital Humanities: Journals* provided by USC Libraries Research Guides, and *Digital Humanities: Journals* provided by UIC University Library Research and Subject Guides
- Cross-comparing the lists
  - Three journals were selected: *Digital Humanities Quarterly* (DHQ), *Digital Scholarship in the Humanities* (DSH) (formerly known as *Literary and Linguistic Computing*), and *Digital Studies / Le champ numérique* (DS/CN)
- Identifying IV-related articles
  - whether the article's title, abstract, or keyword mentioned information visualization, data visualization, visual analytics, visualization, or visualizing
  - whether information visualization techniques were used to address the article's research needs.

## Data: DH Journals (cont.)

Journal Name	Format/Type	# of Issues per Year (2012-2016)	Total # of Published Articles (2012-2016)	Total # of InfoVis-related Articles (2012-2016)	% of InfoVis-related Articles (2012-2016)
DHQ	Open access, peer-reviewed, online only	3-4	138	49	26.2%
DSH	Peer-reviewed, print & online	4	205	72	25.99%
DS/CN	Open access, peer-reviewed, online only	1-3 (rolling basis)	53	17	24.29%

## Data: DH Online Resources

- According to Adams and Gunn (2013),
  - “DH invites—and demands—collaboration with parties outside of the library”
  - “Librarians need additional training and education in order to contribute effectively”
- Academic library websites with a focus on *both* DH and IV were considered
  - Three university library guides were selected for analysis:
    - USC Libraries Research Guides for The Digital Humanities: Digital Visualization*
    - University of Tennessee-Knoxville University Libraries Research Guides for Digital Humanities: Visualizations*
    - Cornell University Library Research Guides for Digital Humanities: Data Visualization*

## Results: DH Journals

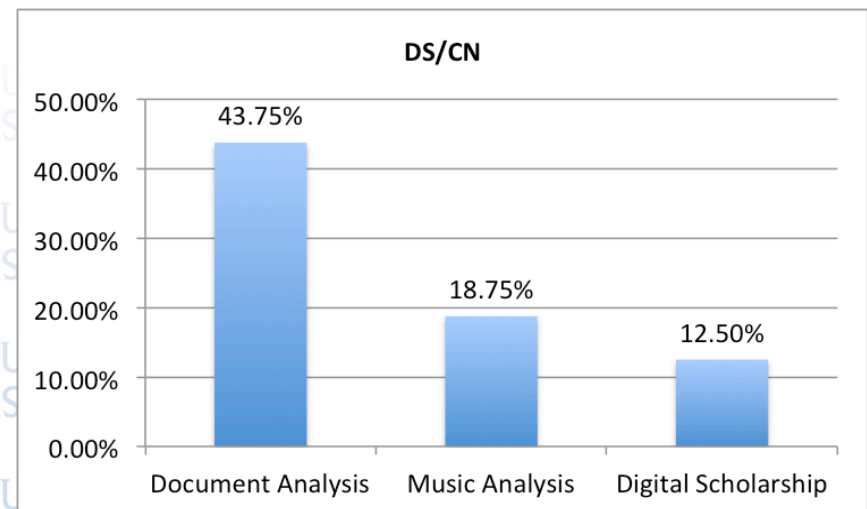
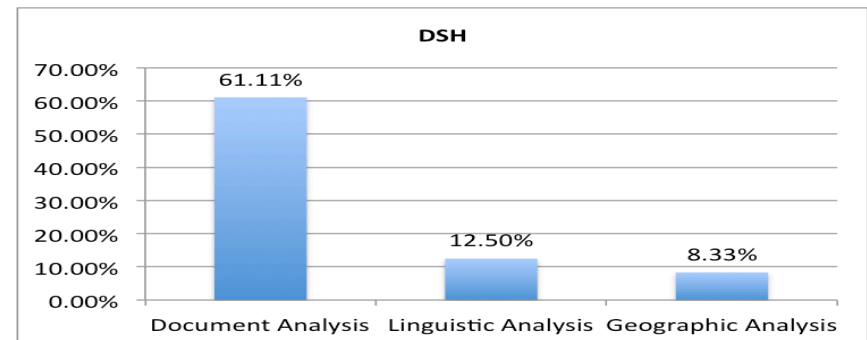
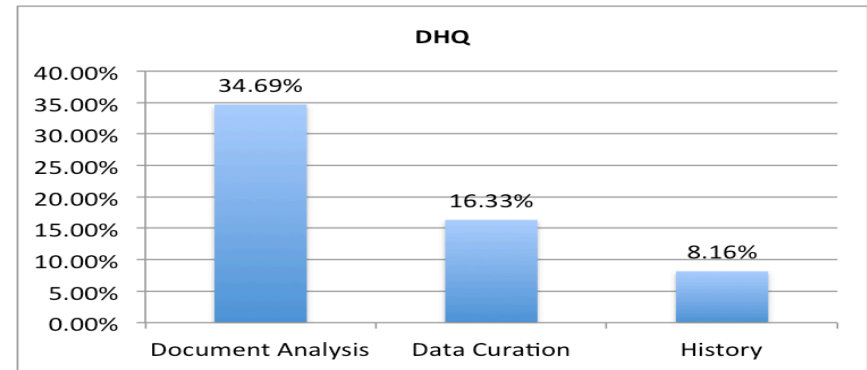
- Three categories of IV use were examined: tools, applications, and purposes
- IV Tools
  - At an aggregate level, approximately 70% of the visualization tools used in DH research were free and open-source
    - E.g., Neatline for geo-temporal interpretation of archival collections (Nowviskie et al. 2013) and ANNIS for visualizing complex multi-layer linguistic corpora (Krause and Zeldes 2016)
    - More than half was designed and developed by the author(s)
  - About 30% of the visualization tools used enterprise software
    - E.g., Carrot for visualizing and making sense of a large Web collection through cluster analysis (Miligan et al. 2016)

## Results: DH Journals (cont.)

- IV Applications (broadly defined)
- For example,
  - “document analysis” application includes analysis of not only textual data such as corpus and archives but also screenplays and hypertexts.
  - “history” applications cover studies ranging from literary history to art history

## Results: DH Journals (cont.)

- IV Applications (broadly defined)



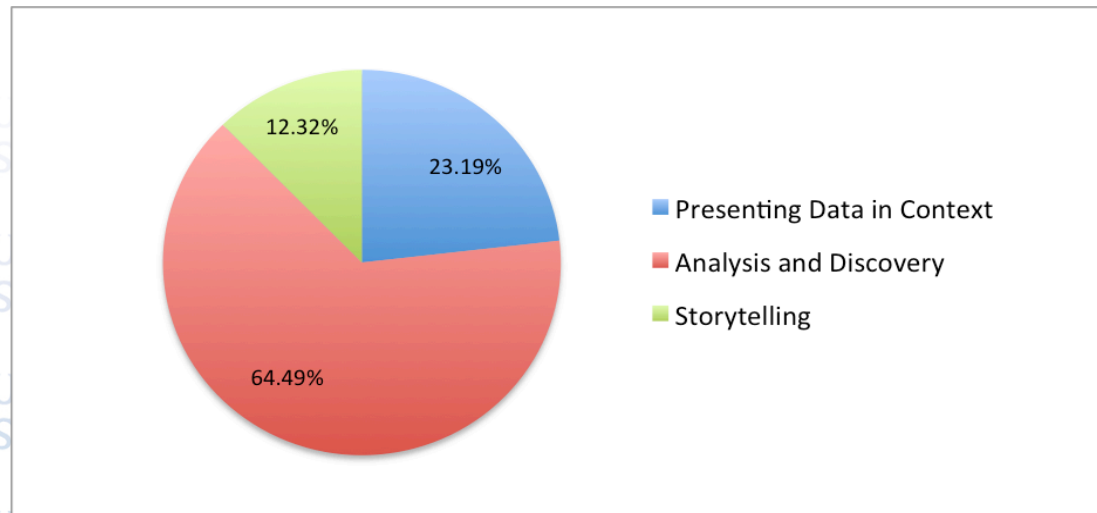
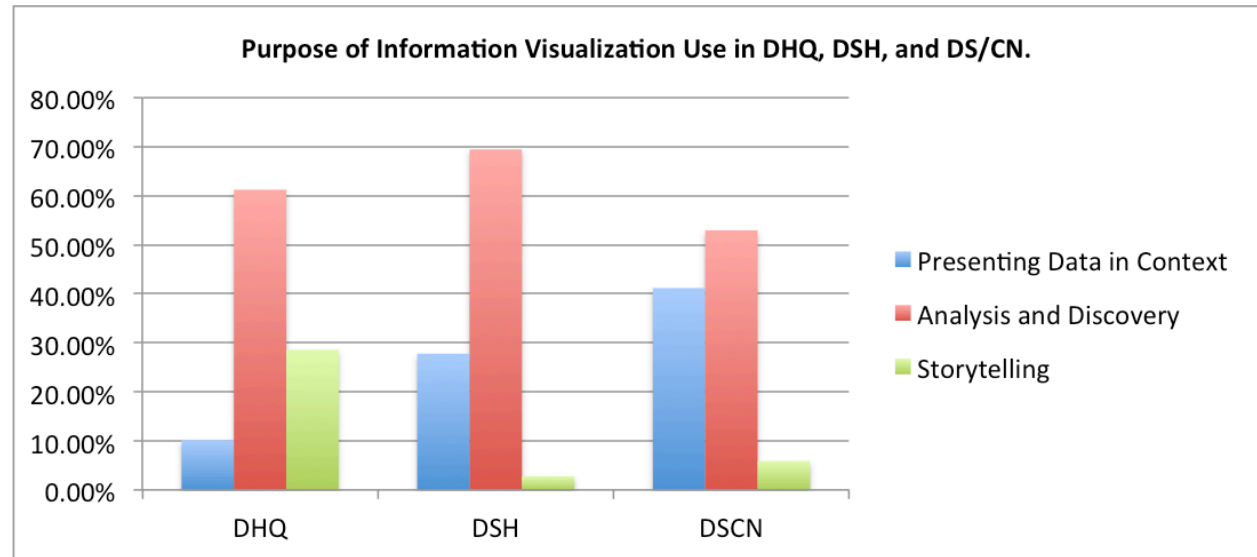
## Results: DH Journals (cont.)

- IV Purposes
- Based on Agrawala (2005), there are three main purposes of information visualization use
  - presenting data in context: communicate existing information to others
  - analysis and discovery: using visualization techniques to help discover new knowledge, insights, and even questions
  - storytelling: designing a graphic that connects to and resonates with users through an overarching theme



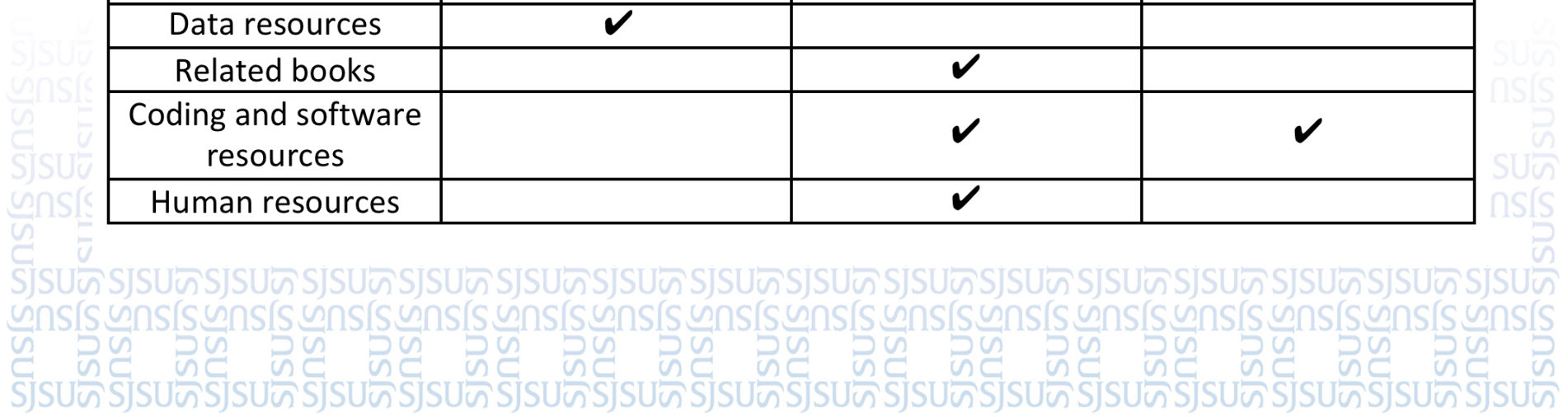
# Results: DH Journals (cont.)

- IV Purposes

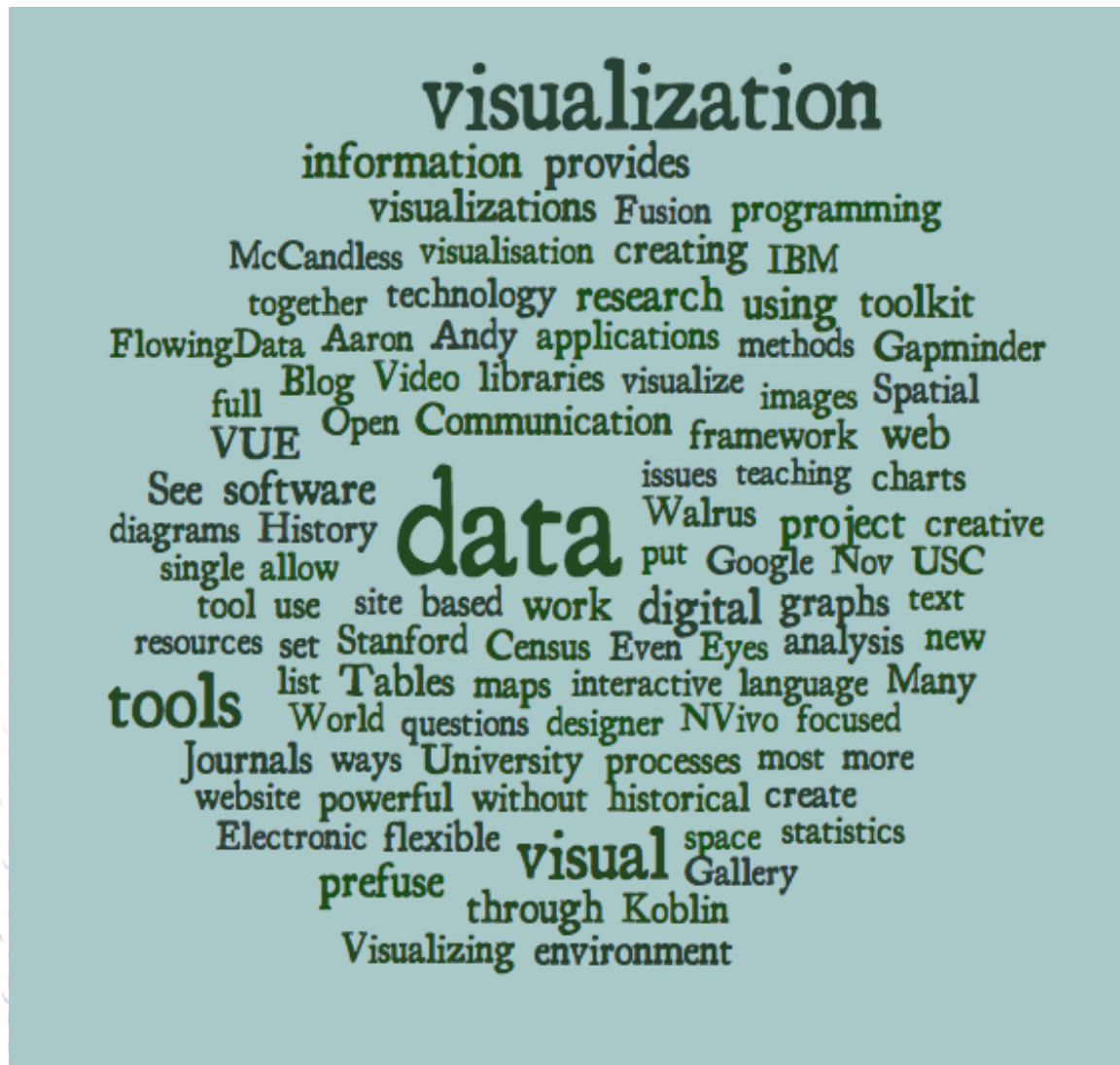


# Results: University Library Research Guides

Information visualization components	<i>USC Libraries Research Guides for The Digital Humanities: Digital Visualization</i>	<i>University of Tennessee-Knoxville University Libraries Research Guides for Digital Humanities: Visualizations</i>	<i>Cornell University Library Research Guides for Digital Humanities: Data Visualization</i>
Definition	✓		
Introduction	✓	✓	
Journals	✓	✓	
Apps/Tools	✓	✓	✓
Data resources	✓		
Related books		✓	
Coding and software resources		✓	✓
Human resources		✓	



## Results: University Library Research Guides (cont.)



## Insights and Discussions

- The “depth” of IV use matters more—namely how IV has been applied (applications), and why it has been adopted (purposes).
- It is important to recognize the wide variety of applications for IV in DH research.
  - The application of IV is strongly correlated with the humanities data under consideration, whether it be corpus, archives, music, or artwork.
  - For most of IV-related work in DH, the purpose is to analyze and discover.
    - What is the most accurate way to interpret the visualization results?
    - What can be deduced or mined from these results?
    - How can new discoveries and insights be drawn from the visualizations?

## Insights and Discussions (cont.)

- Be familiar with common data types in digital humanities research, and understand what kinds of data work best with each visualization technique
- Capitalize on online courses such as MOOCs to hone the skills in using visualization apps and tools
- Recognize the importance of applying analytical thinking to make the best possible interpretation of the visualization results
- Never be afraid to reach out for the “human resources” (i.e., the domain experts) for collaboration opportunities



# References

- Adams, J. L., & Gunn, K. B. (2013). Keeping up with...digital humanities. *Keeping Up With...*, Association of College & Research Libraries.
- Agrawala, M. (2017). "The Purpose of Information Visualization," accessed March 8, 2017, <https://courses.cs.washington.edu/courses/cse558/05wi/forweb/purpose/purpose.pdf>.
- Bradley, A. J., Kirton, T., Hancock, M., & Carpendale, S. (2016). Language DNA: Visualizing a language decomposition. *Digital Humanities Quarterly*, 10(4).
- Breure, L., Hoogerwerf, M., & van Horik, R. (2014). Xpos're: A tool for rich Internet publications. *Digital Humanities Quarterly*, 8(2).
- Ferguson, K. L. (2017). Digital surrealism: Visualizing Walt Disney animation studios. *Digital Humanities Quarterly*, 11(1).
- Forlini, S., Hinrichs, U., & Moynihan, B. (2016). The stuff of science fiction: An experiment in literary history. *Digital Humanities Quarterly*, 10(1).
- Hoyt, E., Ponto, K., & Roy, C. (2014). Visualizing and analyzing the Hollywood screenplay with ScripThreads. *Digital Humanities Quarterly*, 8(4).
- Huff, J. (2007). Information visualization as a tool for teaching research skills. *ACRL 13<sup>th</sup> National Conference*, Baltimore, MD, March 29—April 1, 215-218.
- Lynch, T. J. (2014). Social network and archival context project: A case study of emerging cyberinfrastructure. *Digital Humanities Quarterly*, 8(3).
- Magnuson, L. (2016). *Data visualization: A Guide to Visual Storytelling for Libraries*. Lanham, MD: Roman & Littlefield Publishers.
- Murrieta-Flores, P., Donaldson, C., & Gregory, I. (2017). GIS and literary history: Advancing digital humanities research through the spatial analysis of historical travel writing and topographical literature. *Digital Humanities Quarterly*, 11(1).
- Roff, S. (2011). Visualizing history: Using museum skills to teach information literacy to undergraduates. *College & Undergraduate Libraries*, 18(4), 350-359.
- Suarez, J. L., Sancho-Caparrini, F., Ortega, E., de la Rosa, J., Caldas, N., & Brown, D. (2013). Towards a digital geography of Hispanic baroque art. *Digital Scholarship in the Humanities*, 28(4), 718-735.
- Soukup, T., & Davidson, I. (2002). *Visual Data Mining: Techniques and Tools for Data Visualization and Mining*. Hoboken, NJ: Wiley.
- Tzankova, V., & Schiphorst, T. (2010). Visualization of Islamic religious symbolism on the Internet: A conceptual blending. *Parsons Journal for Information Mapping*, 2(4).
- Womack, R. (2014). Data visualization and information literacy. *IASSIST Quarterly*, 38(1), 12-17.

# Q&A

