**SULA — Visual**

<4 figures, 1 table>

**Visual First Amendment: A Case Study in Empirical Legal Studies, Visualization, and User Experience**

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This paper uses the Visual First Amendment (VFA) project to highlight the use of data visualization, user experience studies, and computational methods in the study of law. VFA presents visitors with interactive displays that allow them to explore the interrelation of issues, cases, courts, and justices over time, and to consider the broad social and legal changes that have impacted the United States Supreme Court’s ruling on the First Amendment freedoms of religions, speech, press, assembly, and petition. We begin by situating our project in the emerging field of empirical legal studies and describing the open data sources used to create our visualizations. We also discuss several usability tests conducted to improve our visualizations, and the development of the project cycle from concept to dissemination. Explicit attention is given throughout to digital humanities aspects of the project.

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In 1897, future U.S. Supreme Court justice Oliver Wendell Holmes Jr. observed, ‘For the rational study of the law the black-letter man may be the man of the present, but the man of the future is the man of statistics and master of economics’ (Buckler, 2012). Holmes was addressing the need for law to look beyond historical examples to the social realities of the time. His methodological suggestion, however, has found new life in the era of digital humanities.

This paper presents the Visual First Amendment (VFA) project, which applies empirical methods and visualization techniques to the study of the First Amendment of the U.S. Constitution. VFA aims to

• Provide a deeper understanding of the American constitutional freedoms of religion, speech, press, assembly, and petition.

• Engage citizens in a discussion of rights, as interpreted now and in the future.

• Raise awareness of First Amendment issues from a historical and legal perspective.

• Racilitate research surrounding the First Amendment across a range of education levels and information tasks.

• Serve as a model for representing Supreme Court data generally.

We begin by giving an overview of empirical legal research and similar projects that have been attempted to date. Following that, we describe the data sources and visualization tools behind several VFA interfaces. Finally, we present the results of user experience studies, as well as future directions.

**Background**

Traditional legal scholarship consists of detailed analysis of primary sources (e.g., legislation and court rulings), supplemented by secondary sources such as legal scholarship. Empirical legal research, first employed in American legal scholarship in the late 1990s, ‘uses data analysis to study the legal system’ (Georgetown Law, 2014). While this approach is still not widespread, it has been described as ‘the next big thing’ in legal intellectual thought (George, 2006).

Cane and Kritzer (2010) describe empirical legal research as involving ‘the systematic collection of information (“data”) and its analysis according to some generally accepted method’ and the (possibly numeric) coding or tagging of units of text. This research is often interdisciplinary—examining questions in the intersection of law, society, and economics, as well as judicial behavior and politics—and uses both quantitative/statistical and qualitative methods. Most data used in empirical legal studies are ambient in the sense that they are generated through judicial processes rather than through experiments, which would raise ethical risks in the case of law (Epstein and Martin, 2010).

The proliferation of law-related datasets and the increasing availability of data to the general public represent an important step toward increased civic engagement. The U.S. Open Government Initiative makes available over 200 datasets, which are used by journalists, researchers, and the general public for a variety of purposes, among them government oversight and accountability. The Sunlight Foundation, for example, has supported several projects that draw on publicly available data to promote government oversight practices such as tracking the link between campaign contributions and congressional votes on legislation and public policy.

To date, however, few attempts have been made to visualize court rulings, and none are focused on presenting data about the First Amendment for a wide variety of audiences:

• One of the earliest projects, Visualizing Legal Information (http://www.cs.umd.edu/hcil/west-legal), was created in the late 1990s in the Human Computer Interaction Lab at the University of Maryland. It is no longer updated, and most of the visualizations are no longer functional.

• A group of researchers from the University of Oslo is working on an interdisciplinary Law and Visualization project (http://www.jus.uio.no/english/research/areas/law-history/projects/law\_visualization.html), which focuses on the relations between law and visualization as expressed in art, architecture, and film. Though the project is described as ‘empirical’, it does not employ data-driven methods, instead examining the experience of aestheticians and their concepts of law.

• The Judicial Research Initiative (http://artsandsciences.sc.edu/poli/juri) from the University of South Carolina aims to ‘provide a comprehensive access point to the most recent and cutting-edge research on law and judicial politics.’. This project only has datasets available for download and does not include visualization.

Visual First Amendment is unique among these projects as it applies visualization techniques to First Amendment data for a wide range of users. The information presented by the site is also highly contextualized both historically and thematically.

**Project Design**

Visual First Amendment draws on three freely available data sources, which have been selected for their recognized excellence in the field:

• First Amendment Timeline is compiled by the First Amendment Center, an operating program of the Freedom Forum located at the Newseum and Vanderbilt University. The Timeline is a chronological list of 150-plus American historical events, Supreme Court rulings, and legislation relating to the First Amendment from 1215 to 2011, with narrative descriptions of each event.

• Supreme Court Database (SCDB) is a National Science Foundation project hosted by the Center for Empirical Research in the Law at Washington University in St. Louis with nearly a dozen contributing law schools. SCDB contains data on 8,407 cases, 655 of which are classified as First Amendment cases, with over 200 pieces of information coded about each case. While this schema has received some criticism (Shapiro, 2008), it is highly regarded and used by scholars in various publications (Buckler, 2012; Sharma, 2013; Stearns, 2013), including a recent book on behavior of federal judges (Epstein et al., 2013). The project currently covers cases between the 1946 and 2012 terms and has a timetable established for the addition of other years.

• Supreme Court Citation Network Data, compiled by James H. Fowler (UCSD) and Sangick Jeon (Stanford), contains 202,167 citations to and from 30,288 Supreme Court majority opinions over the 1800–2002 period.

The initial VFA prototype contains a range of visualizations based on these data sources. A complete list of these pairings is given in Table 1, and each type of visualization is described below.

**Visualization Type Software Data**

timelines TimelineJS First Amendment Center Timeline

statistical charts and graphs Tableau Public SCDB

networks Gephi SCDB, Citation Network Data geographic maps Leaflet, QGIS, Tableau Public SCDB

Table 1.

*Timelines*

Timelines are the simplest and most easy-to-read displays used in the project. The current prototype includes a timeline of 100-plus major cases and historical events, as well as curated timelines around specific First Amendment stories. Users can swipe through the timeline using their mouse or touchscreen, and events are divided into a number of categories, including world/national events and various First Amendment freedoms.

**Visual First Amendment Timeline Browser**



Figure 1. http://visualfa.org/timeline/.

*Statistical Charts and Graphs*

VFA includes several statistical charts and graphs about First Amendment rulings as well as Supreme Court justices. These visualizations are interactive, allowing the user to select, filter, and manipulate the information presented, and can be shared or embedded across blogs, websites, and social media.

**Justice Voting Patterns by Ideology**



Figure 2. http://visualfa.org/statistics/justices-by-ideology/.

*Network Maps*

Networks are among the most complex yet frequently discussed visualizations in the initial prototype. These graphs illustrate the relationships between court opinions and agreement between justices. Each dot represents a case; hovering over the dot calls up the name of the case, and clicking on it opens a sidebar with full case details. Cases are searchable by name or by topic.

**Citation Network of Majority Opinions by First Amendment Issue**



Figure 3. http://visualfa.org/citation-network-maps/network-maps-a-guided-tour.

*Geographic Maps*

Geographic maps are some of the first visualizations that young users learn to read, and they bring a new dimension of spatial reasoning to historical and thematic content. Several maps in our initial prototype illustrate the behavior of circuit courts, visually investigating whether these courts merit their reputations as being conservative or liberal in their rulings. A separate map examines the number of cases that arise from each state, filterable by issue, petitioner categories, respondent categories, and more.

**Circuit Court Map by Decision Ideology**



Figure 4. http://visualfa.org/circuit-court-map/.

**User Experience**

In spring 2014 the Visual First Amendment team conducted an initial round of user experience tests (Pratt IRB #189/2-12-14) at the American Civil Liberties Union and New York Civil Liberties Union offices in downtown Manhattan. Five users were tested using a talk-out-loud method in which they were asked to complete tasks and to narrate their decisionmaking process as they go. The tests were recorded using the Silverback Screen Capture software so that user behavior could be examined later. Users were also asked for general feedback on the site, including its potential audiences. We also spoke more informally with law students, law faculty, and law librarians, who have a special interest in the content of the project. This research has led to a number of site revisions, including

• Site navigation with multiple points of entry.

• Contextual information and details on demand within visualization interfaces.

• Curated datasets and stories that introduce more advanced interfaces.

**Future Directions**

At present, we are working to collaborate with humanities scholars, legal advisors, and media experts on content and visualizations that reflect general/public interest. To further public engagement, the project would benefit from additional user testing with broader audiences as well as the creation of additional tutorial videos and other instructional materials for the website. Finally, we hope to create an integrated user experience across multiple types of visualizations and to link with external resources, such as news stories and reference sources.

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