Doctoral Research Agenda

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Information Science

Law

Legal Informatics,
Organization of Legal Information,
Access to Legal Information

Information Visualization,
Knowledge Organization Systems,
Bibliometrics

Semantic Network Theory of Learning,
Schematic Maps,
Pedagogy of the Online Environment

Educational Psychology / Cognitive Science
Law / IS / Pedagogy

General Research Question:
How can network graphing and information visualization techniques improve the understanding of the work of the United States Supreme Court?
Appointed by a Democrat

Appointed by a Republican

Voting frequencies represented as the edge weight between nodes and presented visually as a graph. Scalia and Thomas vote most frequently together and are joined least frequently by Stevens. O’Connor, and to a lesser extent Kennedy, are the judges most likely to join the liberal members of the Court. (Rendered with Pajek using a stochastic, spring force algorithm.)


Source: Statistics harvested from the Harvard Law Review
Thresholding (Voting Together > 50%) Reveals Ideological Cliques

Thresholding (Voting Together > 49%) Reveals Ideological Cliques
Use the taxonomy of case types in the Table of Contents to aggregate voting associations by individual topics.

### Criminal Law and Procedure

- Voting Associations
- \( \text{Taxonomy of Case Types} \)
- Voting Associations

### Freedom of Speech & Expression

- Voting Associations
- \( \text{Taxonomy of Case Types} \)
- Voting Associations

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### 2nd Expansion – Expand Voting Associations back to 1967

<table>
<thead>
<tr>
<th>Year</th>
<th>President</th>
<th>Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>Richard M. Nixon</td>
<td>Republican</td>
</tr>
<tr>
<td>1969</td>
<td>Gerald R. Ford</td>
<td>Republican</td>
</tr>
<tr>
<td>1977</td>
<td>James E. Carter</td>
<td>Democrat</td>
</tr>
<tr>
<td>1981</td>
<td>Ronald Reagan</td>
<td>Republican</td>
</tr>
<tr>
<td>1989</td>
<td>George H.W. Bush</td>
<td>Republican</td>
</tr>
<tr>
<td>1993</td>
<td>William J. Clinton</td>
<td>Democrat</td>
</tr>
</tbody>
</table>


1994-1995: Current Visualizations / Data

2003-2004: Current Visualizations / Data
Base Map/Overlay Pedagogical Visualizations of the Work of the United States Supreme Court

- Create visualizations of the work of the United States Supreme Court to be used for teaching.

- Create a topical Base Map to serve as a common reference point on which to layer additional information.

Base Map Creation

- Technique 1– Use the co-occurrence of West topics (keynumbers) to render the topical adjacencies of American caselaw.

- DATASET - The dataset consists of:
  - All top level West topics assigned to United States Supreme Court cases from the 1944 term through the end of the 2004 term and their co-occurrence.
  - 7,846 unique cases to which 19,789 topic assignments have been made.
  - Of the 405 topics in the West taxonomy, 291 appear in opinions issued by the Supreme Court for this time period.
  - This results in 22,345 edges with 3743 unique topic pairings.
Problem:

- There are three types of West top level topics:
  - Procedural (green)
  - Factual (red)
  - Doctrinal (blue)

- The three types can co-occur in a wide variety of cases.

- For instance, procedural topics may co-occur with just about any factual or substantive topic.
Technique 2

- Use the “Topics By Specialty” assignments in West’s Analysis of American Law to create a topic map.

- Problem: Some topics are still assigned to too many top level substantive categories.

- This creates more unmanageable spaghetti.
Remedy

- Remove the most tenuous, multiple, subject assignments that pull everything to the center:
Technique 3:

The above image represents all topics identified as doctrinal and assigned to law School class subjects. These were then subjected to a double treatment. (1) Each of the 55 classes was paired with its most frequently occurring subjects. (2) The graph was reduced to an edge weight exceeding 10 case co-occurrences.
Research Goal

Spatial navigation / visualization of bibliographic data in which the underlying structural organization of the domain is conveyed to the user.