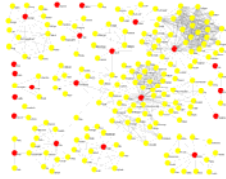
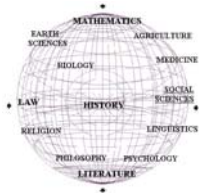


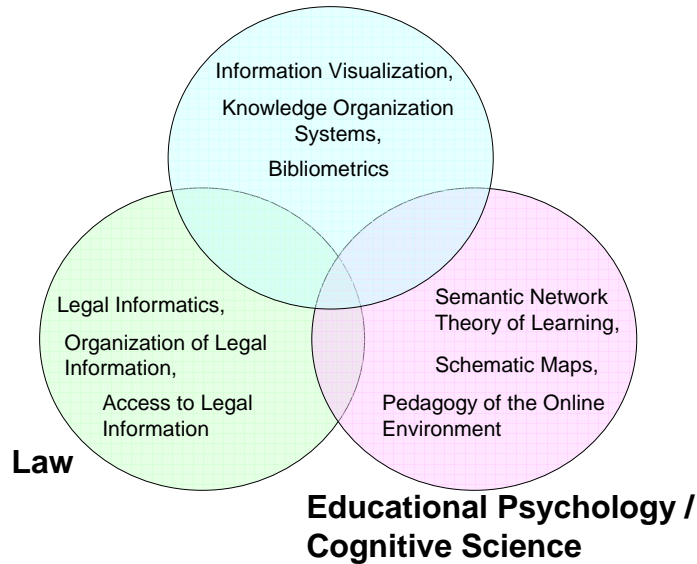
# Doctoral Research Agenda



**Peter A. Hook**  
 Information Visualization Laboratory  
 March 22, 2006



## Information Science



**Select Productivity to Date**

**Information Science**  
Information Visualization,  
Knowledge Organization  
Systems,  
Bibliometrics

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

**Educational Psychology /  
Cognitive Science**  
Semantic Network,  
Theory of Learning,  
Schematic Maps,  
Pedagogy of the Online  
Environment

2004 IV Lab Open House

2005 SLIS - Doctoral Forum

2006 ALISE - San Antonio

2006 Law & Networks UIUC

Hook, Peter A. and Börner, Katy. (2005) Educational Knowledge Domain Visualizations: Tools to Navigate, Understand, and Internalize the Structure of Scholarly Knowledge and Expertise. In Amanda Spink and Charles Cole (eds.) *New Directions in Cognitive Information Retrieval*. Springer-Verlag.

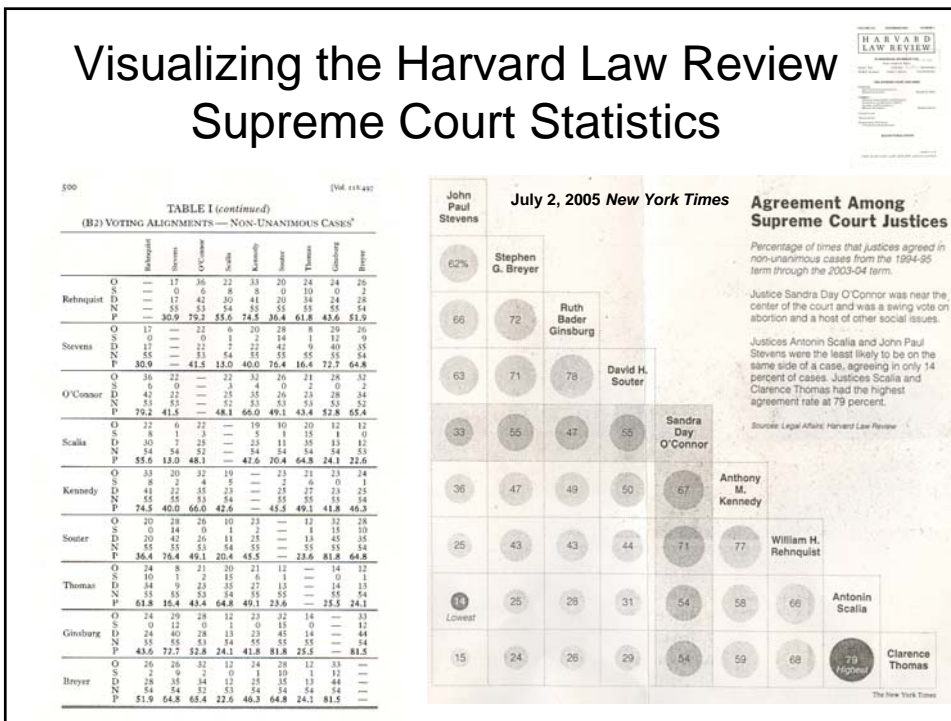
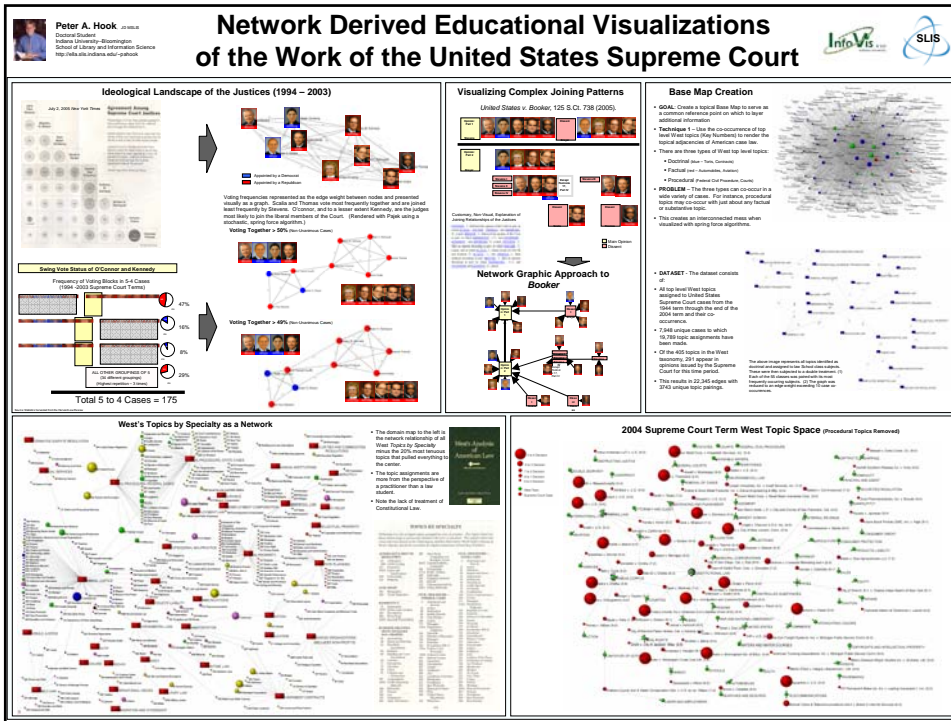
2005 IV Lab Open House

2006 L578: User Interface Design

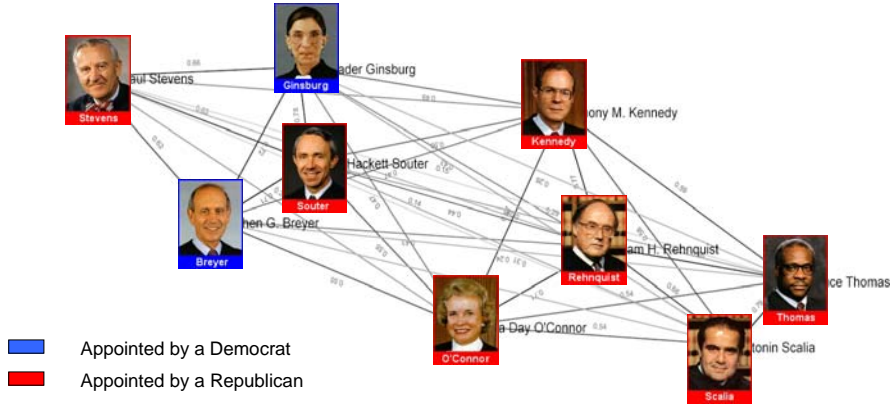
## Law / IS / Pedagogy

### General Research Question:

How can network graphing and information visualization techniques improve the understanding of the work of the United States Supreme Court?



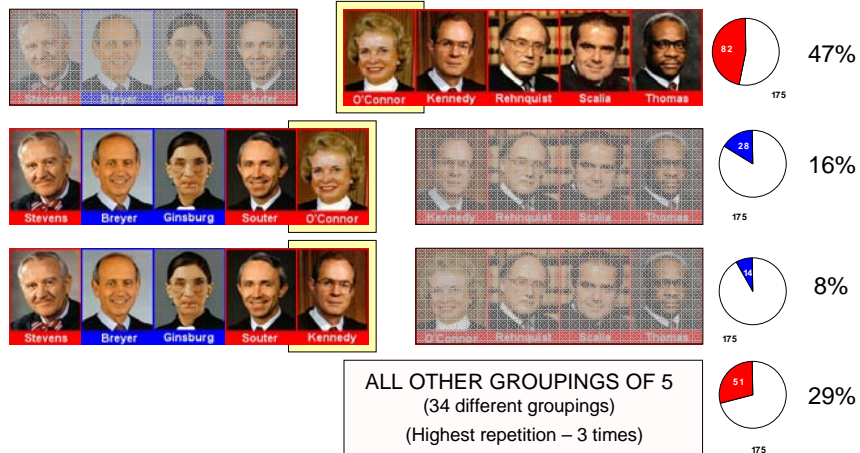
## Ideological Landscape of the Justices (1994 – 2003)



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.)

## Frequency of Voting Blocks in 5-4 Cases

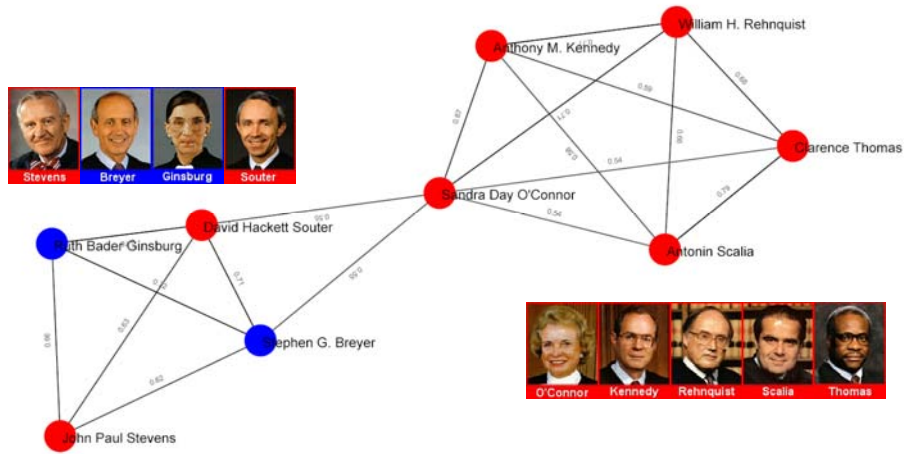
(1994 -2003 Supreme Court Terms)



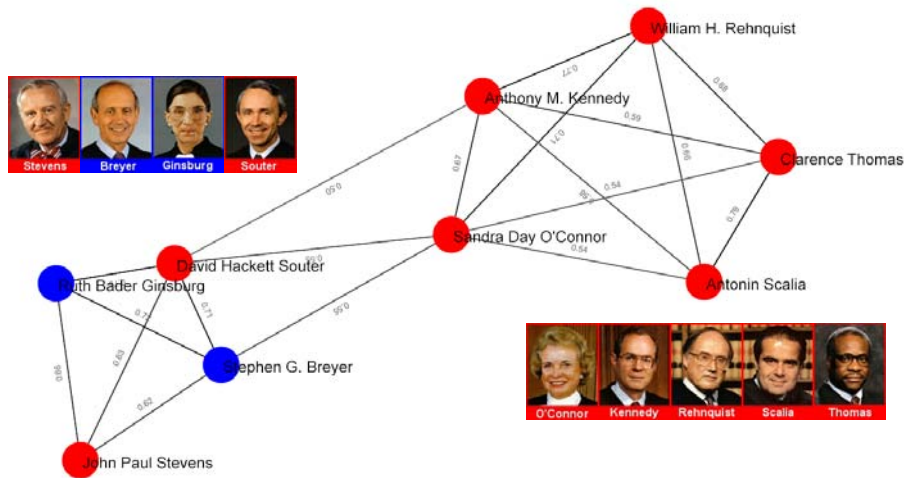
**Total 5 to 4 Cases = 175**

Source: Statistics harvested from the Harvard Law Review

## Thresholding (Voting Together > 50%) Reveals Ideological Cliques



## Thresholding (Voting Together > 49%) Reveals Ideological Cliques



HARVARD LAW REVIEW

THE SUPREME COURT  
2000 TERM

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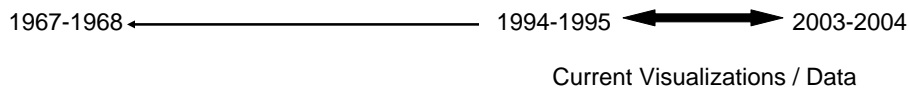
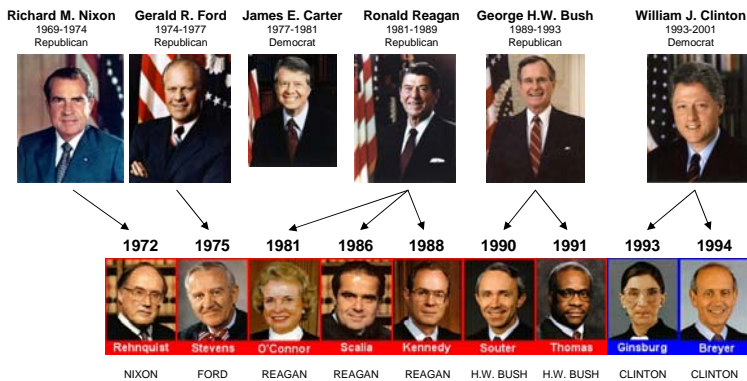
# Additional Work (Less Well Known Stories)

Use the taxonomy of case types in the Table of Contents to aggregate voting associations by individual topics.

Criminal Law and Procedure

Freedom of Speech & Expression

## 2<sup>nd</sup> Expansion – Expand Voting Associations back to 1967



# 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.

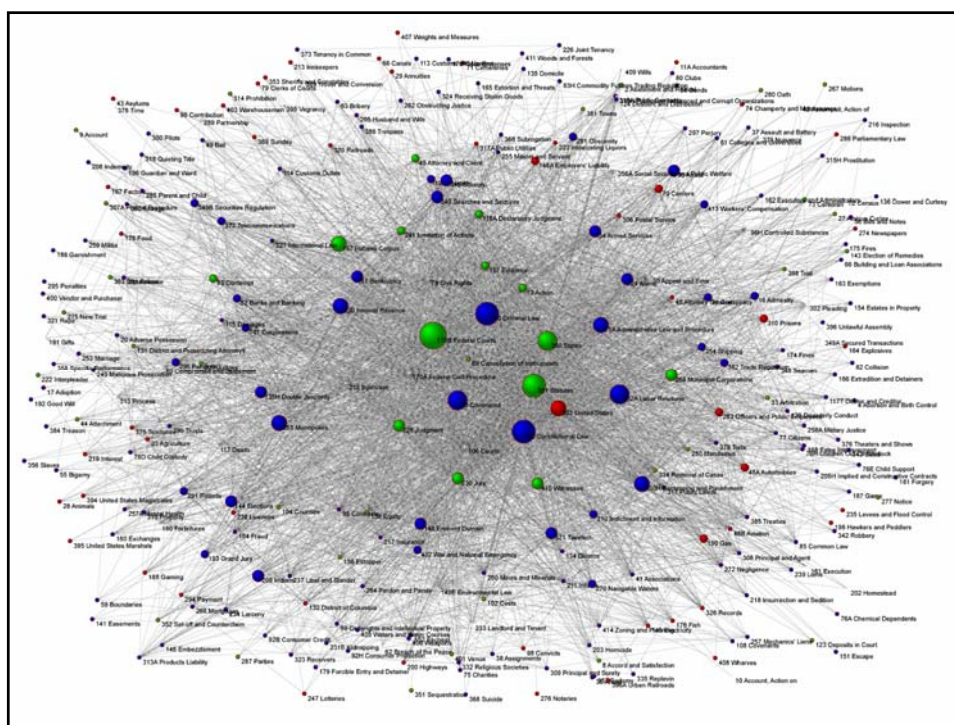
- **DATASET** - The dataset consists of:
- All top level West topics assigned to United States Supreme Court cases from the 1944 term through the end of the 2004 term and their co-occurrence.
- 7,948 unique cases to which 19,789 topic assignments have been made.
- Of the 405 topics in the West taxonomy, 291 appear in opinions issued by the Supreme Court for this time period.
- This results in 22,345 edges with 3743 unique topic pairings.

### 4 Headnotes assigned by West to *Brown v. Payton*

The image shows two pages of the *Brown v. Payton* case. Red circles highlight specific West keynotes and their corresponding text in the headnotes. The keynotes are: 1) *Religion* (18A, 18B, 18C, 18D, 18E, 18F, 18G, 18H, 18I, 18J, 18K, 18L, 18M, 18N, 18O, 18P, 18Q, 18R, 18S, 18T, 18U, 18V, 18W, 18X, 18Y, 18Z, 19A, 19B, 19C, 19D, 19E, 19F, 19G, 19H, 19I, 19J, 19K, 19L, 19M, 19N, 19O, 19P, 19Q, 19R, 19S, 19T, 19U, 19V, 19W, 19X, 19Y, 19Z, 20A, 20B, 20C, 20D, 20E, 20F, 20G, 20H, 20I, 20J, 20K, 20L, 20M, 20N, 20O, 20P, 20Q, 20R, 20S, 20T, 20U, 20V, 20W, 20X, 20Y, 20Z, 21A, 21B, 21C, 21D, 21E, 21F, 21G, 21H, 21I, 21J, 21K, 21L, 21M, 21N, 21O, 21P, 21Q, 21R, 21S, 21T, 21U, 21V, 21W, 21X, 21Y, 21Z, 22A, 22B, 22C, 22D, 22E, 22F, 22G, 22H, 22I, 22J, 22K, 22L, 22M, 22N, 22O, 22P, 22Q, 22R, 22S, 22T, 22U, 22V, 22W, 22X, 22Y, 22Z, 23A, 23B, 23C, 23D, 23E, 23F, 23G, 23H, 23I, 23J, 23K, 23L, 23M, 23N, 23O, 23P, 23Q, 23R, 23S, 23T, 23U, 23V, 23W, 23X, 23Y, 23Z, 24A, 24B, 24C, 24D, 24E, 24F, 24G, 24H, 24I, 24J, 24K, 24L, 24M, 24N, 24O, 24P, 24Q, 24R, 24S, 24T, 24U, 24V, 24W, 24X, 24Y, 24Z, 25A, 25B, 25C, 25D, 25E, 25F, 25G, 25H, 25I, 25J, 25K, 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# Problem:

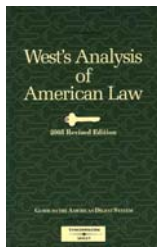
- There are three types of West top level topics:
  - Procedural (green)
  - Factual (red)
  - Doctrinal (blue)
- The three types can co-occur in a wide variety of cases.
- For instance, procedural topics may co-occur with just about any factual or substantive topic.



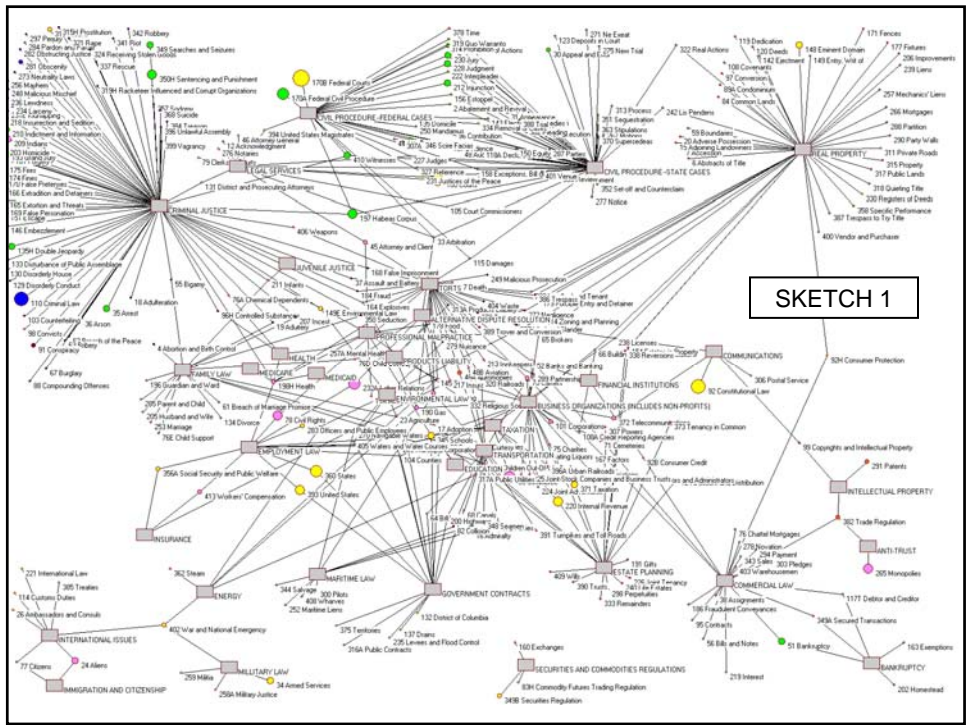


# Technique 2

- 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.

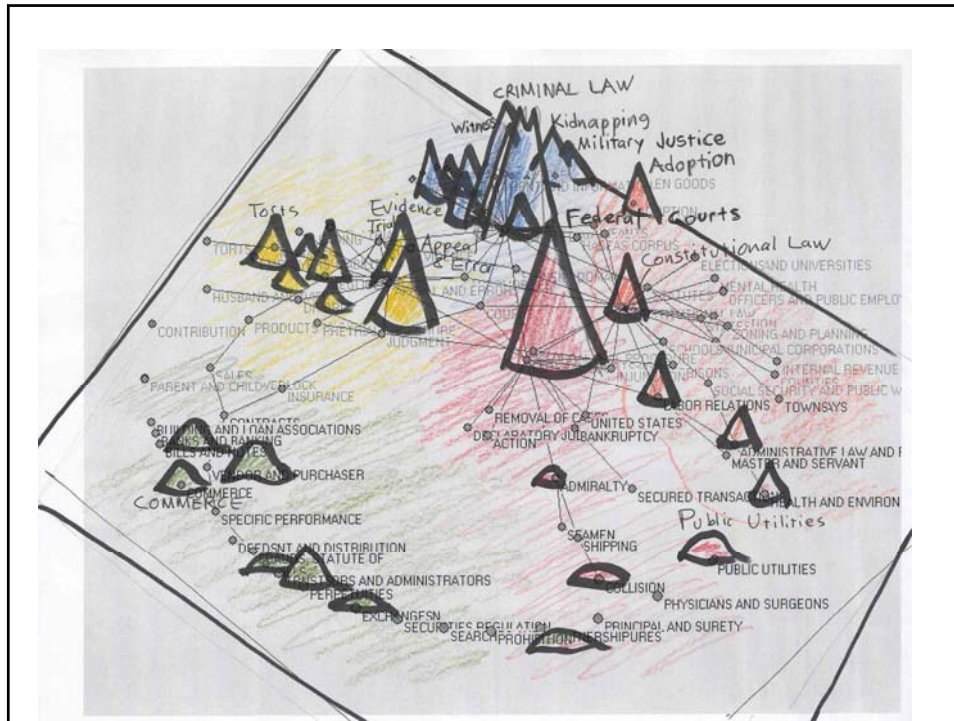


TOPICS BY SPECIALTY		
Following is a list of digest topics grouped by area of practice. The topics listed are those whose scope is primarily related to the area in question. The subject notes and cross-reference found in the listed topics, and the Descriptive Word Index volumes of West's digests, should be consulted for topics containing related Key Numbers.		
<b>ALTERNATIVE DISPUTE RESOLUTION</b>	255 Arbitration 260 Child Custody 217 Insurance 2111 Labor and Employment 256 Partnership 244 Shipping	<b>CIVIL PROCEDURE—STATE CASES</b> 2 Abatement and Revival 13 Action 21 Affidavit 39 Appeal and Error 81 Appearance 44 Attachment 48 Audita Quereza 73 Courtroom 96 Contribution 165 Court Commissioners 198 Courts 115 Damages 118A Declaratory Judgment 123 Deposits in Court 135 Donative 143 Election of Remedies 150 Equality 156 Estoppel 157 Evidence 158 Exceptions, Bill of 161 Execution 190 Garnishment 197 Habeas Corpus 157 Judgment 222 Interpleader 170A Judgment, Bill of 227 Judges 228 Jurisdiction 230 Jury 231 Jurisdiction of the Court 211 Limitation of Actions 242 Lis Pendens 250 Mandamus 267 Motions 271 No Final New Trial 275 Notice 277 Parties 287 Pleading 302 Pleading 307A Federal Procedure 319 Process 314 Prohibition 319 Quo Warranta 307A Federal Procedure 319 Process 314 Prohibition 319 Quo Warranta 322 Real Actions
<b>ANTI-TRUST</b>	385 Monopolies 382 Trade Regulation	<b>CIVIL PROCEDURE—FEDERAL CASES</b> 2 Abatement and Revival 13 Action 33 Adversary 48 Audita Quereza 96 Contribution 106 Courts 115 Damages 118A Declaratory Judgment 151 Election of Remedies 156 Estoppel 157 Evidence 158 Exceptions, Bill of 170A Judgment, Bill of 227 Judges 228 Jurisdiction 230 Jury 231 Jurisdiction of the Court 211 Limitation of Actions 242 Lis Pendens 250 Mandamus 267 Motions 271 No Final New Trial 275 Notice 277 Parties 287 Pleading 302 Pleading 307A Federal Procedure 319 Process 314 Prohibition 319 Quo Warranta 307A Federal Procedure 319 Process 314 Prohibition 319 Quo Warranta 322 Real Actions
<b>BANKRUPTCY</b>	54 Bankruptcy 117T Debtor and Creditor 163 Exemptions 382 Homestead 349A Secured Transactions	<b>COMMERCIAL LAW</b> 75 Chattel Mortgage 279 Note 244 Payment 343 Sale 302 Warehouse 1117 Debtor and Creditor 163 Exemptions 322 Real Actions
<b>BANKRUPTCY</b>	54 Bankruptcy 117T Debtor and Creditor 163 Exemptions 382 Homestead 349A Secured Transactions	<b>COMMERCIAL LAW</b> 75 Chattel Mortgage 279 Note 244 Payment 343 Sale 302 Warehouse 1117 Debtor and Creditor 163 Exemptions 322 Real Actions
<b>BUSINESS ORGANIZATIONS—LEVELS</b>	41 Associations 52 Banks and Banking 54 Beneficial Associations 65 Entities 66 Banking and Loan Associations 70 Carriers 71 Composites 72 Charities 80 Clubs 81 Colleges and Universities 161 Corporations 162 Factories 190 Gas 211 Innskeepers 224 Joint Ventures	<b>COMMERCIAL LAW</b> 75 Chattel Mortgage 279 Note 244 Payment 343 Sale 302 Warehouse 1117 Debtor and Creditor 163 Exemptions 322 Real Actions
<b>NON-PROFITS</b>	135 Donative 143 Election of Remedies 156 Estoppel 157 Evidence 158 Exceptions, Bill of 170A Judgment, Bill of 227 Judges 228 Jurisdiction 230 Jury 231 Jurisdiction of the Court 211 Limitation of Actions 242 Lis Pendens 250 Mandamus 267 Motions 271 No Final New Trial 275 Notice 277 Parties 287 Pleading 302 Pleading 307A Federal Procedure 319 Process 314 Prohibition 319 Quo Warranta 307A Federal Procedure 319 Process 314 Prohibition 319 Quo Warranta 322 Real Actions	<b>COMMERCIAL LAW</b> 75 Chattel Mortgage 279 Note 244 Payment 343 Sale 302 Warehouse 1117 Debtor and Creditor 163 Exemptions 322 Real Actions



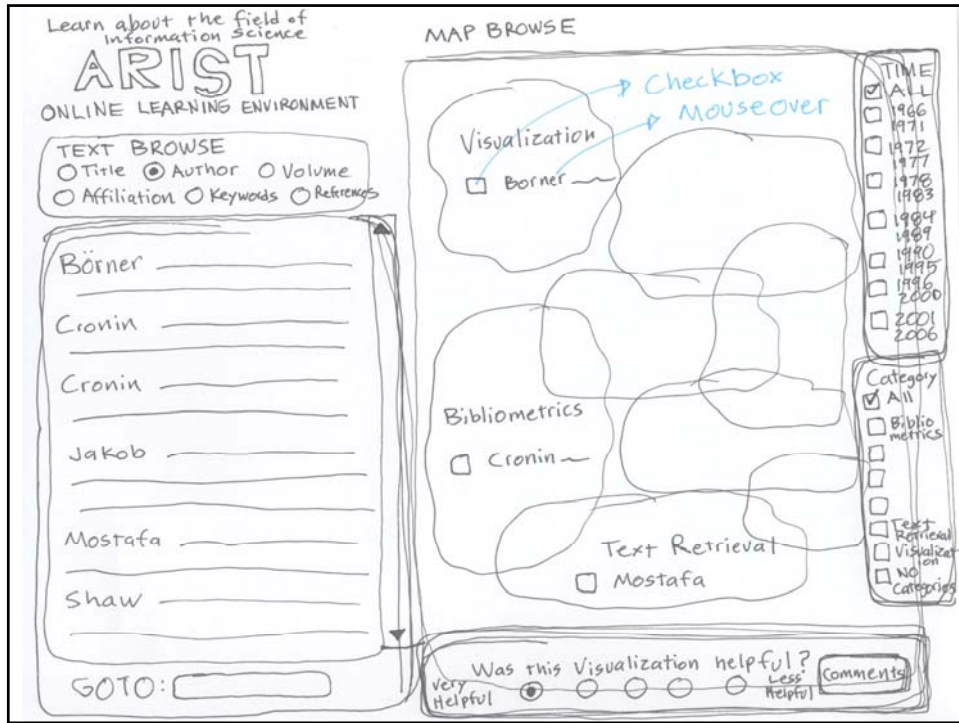






## Research Goal

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



The End