Discovering Issue-Based Voting Groups within the US Senate

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The United States Senate
- Senate bills are extremely long and complex (The much-discussed healthcare bill was 2409 pages!)
- Voters often rely on campaign or interest group spin for information about senators
- Policymakers must synthesize content and voting records to find compromises

Interest Group Ratings
- Interest groups rate senators on a single dimension based on a few votes selected to reflect the group's goals

Political Science Analysis
- Political Scientists have created tools for multi-dimensional analysis that rely on voting records but ignore context

Topic Models
- Unsupervised methods to distill document collections into interpretable topics
- Topic models can be easily extended to account for votes as well as text

Admixture Group Topic
- We propose an admixture version of the Group-Topic model

Mixtures vs. Admixtures
- Most topic models are admixture models, meaning that multiple topics are responsible for the words in each document
- Admixtures can give a more nuanced accounting of the documents in a collection if documents deal with multiple subjects

Results
- Coherent Topics:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Tobacco Regulation</th>
<th>Appropriations/Budgeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>marketing</td>
<td>project</td>
</tr>
<tr>
<td>water</td>
<td>tobacco</td>
<td>bill</td>
</tr>
<tr>
<td>wilderness</td>
<td>pay</td>
<td>summary</td>
</tr>
<tr>
<td>management</td>
<td>risk</td>
<td>reductions</td>
</tr>
<tr>
<td>project</td>
<td>submit</td>
<td>community</td>
</tr>
<tr>
<td>system</td>
<td>practices</td>
<td>improvement</td>
</tr>
<tr>
<td>river</td>
<td>financial</td>
<td>transportation</td>
</tr>
</tbody>
</table>

Intuitive Groups: For a cluster with high percentages of tobacco and regulation topics, most senators are in one group. The exceptions: anti-regulation senators (e.g., Bennett [UT], Coburn [OK]), and tobacco-staters (e.g., Graham [SC], Hagan [NC])

References


This work was supported in part by the Center for Intelligent Information Retrieval and in part by The CIA, the NSA and NSF under NSF grant HU-0326249. Any opinions, findings and conclusions or recommendations expressed in this material are the authors' and do not necessarily reflect those of the sponsors.