**Table 1. Existing models for predicting deputies' votes [[1]](#footnote-1)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Authors | Publication title | Year | Methodology | Data | Quality. |
| Jackman | Multidimensional analysis of roll call data via Bayesian simulation: Identification, estimation, inference, and model checking | 2001 | Bayesian modeling, item-response models, and Full-Information Factor Analysis | 486 votes from the 105th U.S. Senate | - |
| Wang et al. | Joint analysis of time-evolving binary matrices and associated documents | 2010 | Incomplete matrix analysis and topic modeling. Bayesian perspective with inference using Gibbs sampling | Legislative documents and bill metadata for 101-110 sessions (1989- 2008). | - |
| Hanneke | A structural approach to legislative roll call vote prediction. | 2010 | Logistic regression  Support Vector Machine (SVM) | 108th session of the House of Representatives | 81.3% |
| Gerrish, Blei | Predicting legislative roll calls from text | 2011 | A Bayesian ideal point model,  supervised thematic modeling, textual regression | 106 through the 111th Sessions of Congress  4,447 bills, 1,269 legislators, and 183,7033 roll call votes for or against a bill | 89% |
| Wang, Varshney, Mojsilović | Legislative prediction via random walks over a heterogeneous graph | 2012 | random walks on a heterogeneous graph | 110 through the 111th Sessions of Congress. 1,585 bills, 631 legislators, and 638955 votes for or against. | 90.36% |
| Gerrish, Blei | How they vote: Issue-adjusted models of legislative behavior | 2012 | Ideal point model taking into account the subject matter of the documents | 106 through 111th Sessions of Congress  865 legislators, 3,113 bills, and 1,208,709 votes | - |
| Wang et al. | Spatio-temporal modeling of legislation and votes | 2013 | Bayesian ideal point model | 103 to 107 sessions of the House of Representatives and  106 through 111 sessions of the Senate. Senate - 416 bills, House of Representatives - 1,260 bills | - |
| Khashmans | Anticipation of political party voting using artificial intelligence | 2016 | Support vector machine (SVM) and error propagation learning algorithm | votes of parliamentarians in 1984 political party affiliation and responses of 435 congressmen | 96.33% |
| Kraft, Jain, Rush | An embedding model for predicting roll-call votes | 2016 | bilinear model,  multivariate ideal vectors | 110 through the 111th  Sessions of Congress 4,067 bills | 90.6% |
| Budhwar et al. | Predicting the vote using legislative speech | 2018 | Support vector method (SVM), random forest, document categorization, Keras | Thousands of hours of legislative debate in the California State Assembly in 2015-2016. | 76% 83% |
| Kim et al | Estimating spatial preferences from votes and text | 2018 | Gaussian copula factor model, sparse factor analysis (SFA) | 1997-2012. U.S. Senate data | - |
| Korn, Newman | A deep learning model to predict congressional roll call votes from legislative texts | 2020 | Deep learning (DL), convolutional neural networks (CNN), long term memory (LSTM) networks, methods (NLP) | Data from 2019 to 2000, including 3,668 bills from the House and Senate | 76.32% |
| Yang et al. | Joint representation learning of legislator and legislation for roll call prediction | 2021 | Graph convolutional neural networks, recurrent neural networks | Data from 1993 to 2018. 215,857 pieces of legislation, with 2234082 votes for or against. 2,347 legislators. | 78.09% |

**Table 2. Models for predicting bills’ adoption[[2]](#footnote-2)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Authors | Publication title | Year | Methodology | Data | Quality. |
| Yano, Smith, Wilkerson | Textual predictors of bill survival in congressional committees | 2012 | Logistic regression | 103-111 sessions of the House of Representatives  51,762 bills | 83% |
| Nay | Predicting and understanding law-making with word vectors and an ensemble model | 2017 | Neural network learning algorithm, stochastic gradient descent, binary Huffman tree to realize efficient softmax word prediction | Beginning with the 107th session of Congress 14 years and 68,863 bills. | - |
| Bari, Brower, Davidson | Using Artificial Intelligence to Predict Legislative Votes in the United States Congress | 2021 | Multiple models:  L2 Logistic regression  SVM linear method of reference vectors  Decision Tree  MLP (ReLU)  KNN k= 9  Ensemble methods | 113-115 House of Representatives sessions  32,609 bills | Best. 80.13% |

1. The table compiled by the author [↑](#footnote-ref-1)
2. The table compiled by the author [↑](#footnote-ref-2)