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Original Article

Legislative prediction with dual uncertainty minimization from heterogeneous information

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Abstract

Voting on legislative bills to form new laws serves as a key function of most of the legislatures. Predicting the votes of such deliberative bodies leads better understanding of government policies and generate actionable strategies for social good. However, it is very difficult to predict legislative votes due to the myriad factors that affect the political decision - making process. In this paper, we present a novel prediction model that maximizes the usage of publicly accessible heterogeneous data, i.e., bill text and lawmakers' profile data, to carry out effective legislative prediction. In particular, we propose to design a probabilistic prediction model which archives high consistency with past vote recorders while ensuring the minimum uncertainty of the vote prediction reflecting the firm legal ground often hold by the lawmakers. In addition, the proposed legislative prediction model enjoys the following properties: inductive and analytical solution, abilities to deal with the prediction on new bills and new legislators, and the robustness to missing vote issue. We conduct extensive empirical study using the real legislative data from the joint sessions of the United States Congress and compare with other representative methods in both quantitative political science and data mining communities. The experimental results clearly corroborate that the proposed method provides superior prediction accuracy with visible performance gain.

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