



THE UNIVERSITY OF
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Department of Statistics

MASTER'S THESIS PRESENTATION

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Multidimensional Scaling Analysis of Legislative Roll Calls in Multi-Party Systems

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ABSTRACT

Multidimensional Scaling (MDS) is a method for reducing high dimensional data to a low dimensional structure. In this paper, we apply Metric MDS to the legislative roll calls of three countries: United Kingdom, United States, and Canada, over a time period of roughly two decades, using a kernel method and dissimilarity function that has an analytical solution and is locally accurate. We propose a theoretical model that accounts for MDS embedding structures in a multi-party system where parties are well-separated, and explore the relationship between MDS and Spectral Clustering. In addition, connections to contemporary political trends are made – (i) We discover increasing inter-party polarization over time for all legislatures; (ii) From the simulation of legislative behaviors, we argue that empirical results demonstrate intra-party fragmentation along a new issue space, indicating growing insufficiency of the traditional uni-dimensional spectrum.