

EMPIRICAL EVALUATION OF STRATEGY-PROOFNESS OF MAJORITY JUDGMENT

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INTRODUCTION

There has been a lot of work investigating the strategy proofness of various voting methods. While theoretical work (Gibbard-satterthwaite theorem) suggests that no completely strategy free method can exist we can still try to evaluate different voting methods using various criteria. Recently Michel Balinski and Rida Laraki [1] proposed “Majority Judgment” method and claimed that it enjoyed superior strategy resistance properties. The main goal of this research is to compare the strategy proofness of Majority Judgment with some other well known voting algorithms.

MODEL

Our simple evaluation model is inspired by the unpublished work of Mark Tiance Wang, Sanjeev Kulkarni and Paul Cuff [2]. Our model consists of 3 candidates and n voters. Therefore each of the voters can have one of 6 preferences reflecting their ordering of the 3 candidates. The evaluation for each voting method proceeds in the following way:

MODEL (cont)

- (1) Randomly select one of the 6 preferences for each of the n voters with equal probability to create a preference profile.
- (2) Compute the winner of the election based on the initial preferences.
- (3) For each voter i and each preference j: check if changing the preference of voter i to preference j will change the election results. If the election results change, check if the new results are an “improvement” from the perspective of voter i.
- (4) Count the total number of changes which resulted in a new winner and of those changes count the number which resulted in “improved” outcomes.
- (5) Repeat Steps (1) to (4) a 100 times and record the average.

Results

We compared Plurality voting, Boorda Count, Kemeny-Young and Majority Judgment in this model. These experiments were done with 20 voters, and averaged over 100 runs. The results can be seen in the accompanying table.

Conclusion

If we interpret the ratio of “preferable changes” to “all changes” as a measure of vulnerability to strategic manipulation then the results are in accord with our expectations. Plurality Voting and Boorda Count appear to be more vulnerable to strategic manipulation than Kemeny-Young and Majority Judgment.

Works Cited

- Michel Balinski & Rida Laraki, Majority Judgment: Measuring, Ranking and Electing, MIT Press, 2010
- T. Wang, P. Cuff, S. Kulkarni, Strategy-Proofness of Different Voting Systems, Poster Presentation, Purdue University, December 2011

	#Changes	#Positive Changes	#Pos Ch/#Ch
Plurality	27.7	2.34	0.0606
Boorda Count	26.8	1.89	0.0400
Kemeny-Young	49.4	1.80	0.0298
Majority Judgment	8.1	0.22	0.0024



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