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Organization: Washington University

Review #7

Proposal Number: 1152472
NSF Program: Political Science
Principal Investigator: Montgomery, Jacob
Proposal Title: Collaborative Research on Ensemble Methods for the Prediction of Political Outcomes
Rating: Excellent

REVIEW:

What is the intellectual merit of the proposed activity?

1. Motivation/significance. Out of (in) sample forecasting is a critical part of model validation; forecasting contributes to scientific progress. Forecasting also has much to contribute to policy making especially in fields like international relations and comparative politics. This proposal is well-grounded in the respective literatures in political science and in fields like meteorology (Gneiting, Raftery) and macroeconomics (Geweke and Amisano). It contributes something genuinely new in political science: the idea of pooling models to make accurate forecasts. This idea has not been explored yet in any depth, to my knowledge, by any political scientists in international relations or other fields in the discipline.
2. The PIs are well-qualified/prepared to carry out the proposed research. In fact, there is no one in international relations better suited to conduct the proposed research than Ward. In addition, to having a superb knowledge of the theoretical and empirical research in international relations he has extensive experience in (non)governmental forecasting. Finally, Ward is a productive scholar who clearly makes good use of his NSF funds (p. 14). Montgomery is a first-rate young scholar with tremendous technical skills; he already has made a contribution to the work in political methodology on this topic (with Nyland in Political Analysis).
3. The budget is very reasonable. Duke and Washington U.-St. Louis have all the requisite resources needed by the PIs.
4. Research Design. The PIs provide some useful background on ensemble methods for forecasting binary dependent variables. Their discussion is sensitive to specification and computational issues e.g., to the assumption of constant variance in (6) and to convergence problems (fn. 4). They have a clear work plan. Overall I find the research design a bit sketchy. I wish they had omitted the third illustration and expanded pps. 11f a bit. Examples of what is somewhat unclear.
 - 4a. How (stylized) simulations can inform the choice of the bias correction parameter in finite samples (for nonexperts, the relationship between the exposition at the bottom of page 4 and the contents of fn. 12 are difficult to understand).
 - 4b. What tools will be used in the assessment of calibration vs. sharpness and how these tools will be applied in the above mentioned simulations and applications. In view of recent critiques of the PIT/VRH and related calibration tools (Hamill), the plan for evaluating sharpness needs more explanation, for instance, in relation to the suggestions made by Gneiting et al (2007).

What are the broader impacts of the proposed activity?

As regards the NSF list of impacts, at least two should be emphasized:

- i. The production of software that is more readily applicable in social science work is a major plus of this proposal. The Ensemble BMA package in R (2009) is useful but not easy to implement/apply. The software that is produced by this project is sure to be used widely in social science.
- ii. This project will advance our ability to make accurate/useable forecasts of insurgency, state failure, and other important events in the world. In turn, humanitarian and government agencies will be able to anticipate these events and prepare for them. Needless to say, this is of tremendous normative significance.

Summary Statement

My evaluation of this proposal is very positive. I recommend funding it.

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