The Department of Educational Psychology's Research Methods, Measurement, & Evaluation (RMME) program and the Department of Statistics at the University of Connecticut present:

Developments and Extensions in the Quantification of Model Uncertainty: A Bayesian Perspective

Dr. David Kaplan, University of Wisconsin-Madison
Friday, 5/21/2021, 12pm
https://uconn-cmr.webex.com/uconn-cmr/j.php?MTID=m9c9a2619f1a5b404889a0fda12b7a6bc

Issues of model selection have dominated the theoretical and applied statistical literature for decades. Model selection methods such as ridge regression, the lasso and the elastic net have replaced ad hoc methods such as stepwise regression as a means of model selection. In the end, however, these methods lead to a single final model that is often taken to be the model considered ahead of time, thus ignoring the uncertainty inherent in the search for a final model. One method that has enjoyed a long history of theoretical developments and substantive applications, and that accounts directly for uncertainty in model selection, is Bayesian model averaging (BMA). BMA addresses the problem of model selection by not selecting a final model, but rather by averaging over a space of possible models that could have generated the data. The purpose of this paper is to provide a detailed and up-to-date review of BMA with a focus on its foundations in Bayesian decision theory and Bayesian predictive modeling. We consider the selection of parameter and model priors as well as methods for evaluating predictions based on BMA. We also consider important assumptions regarding BMA and extensions of model averaging methods to address these assumptions, particularly the method of Bayesian stacking. Extensions to problems of missing data and probabilistic forecasting in large-scale educational assessments are discussed.

Dr. David Kaplan is the Patricia Busk Professor of Quantitative Methods in the Department of Educational Psychology at the University of Wisconsin – Madison. His research focuses on the development of Bayesian statistical methods for education research, with applications to large-scale cross-sectional and longitudinal survey designs. Dr. Kaplan is an elected member of the National Academy of Education and serves as the chair of its Research Advisory Committee; a recipient of the Samuel J. Messick Distinguished Scientific Contributions Award from the American Psychological Association (Division 5); a past-President of the Society for Multivariate Experimental Psychology; a fellow of the American Psychological Association (Division 5); a recipient of the Alexander Von Humboldt Research Award; an Honorary Research Fellow in the Department of Education at the University of Oxford; and a fellow of the Leibniz Institute for Educational Research and Information and the Leibniz Institute for Educational Trajectories. He was also a Jeanne Griffith Fellow at the National Center for Education Statistics. He received his Ph.D. in Education from UCLA in 1987.

ONLINE INTERDISCIPLINARY SEMINARS ON STATISTICAL METHODOLOGY FOR SOCIAL AND BEHAVIORAL RESEARCH: Support for this seminar comes from Department of Educational Psychology's Research Methods, Measurement, & Evaluation (RMME) program and the Department of Statistics at the University of Connecticut (UCONN), the Statistical and Applied Mathematical Sciences Institute (SAMSI), and the New England Statistical Society (NESS). This seminar aims to promote connection between the statistics and social/behavioral science communities and encourage interdisciplinary research across faculty and students.

For announcements and WebEx live streaming links, please contact Tracy Burke (tracy.burke@uconn.edu). For questions related to the seminars, please feel free to contact the session organizers, Prof. Xiaojing Wang (xiaojing.wang@uconn.edu) and/or Prof. Betsy McCoach (betsy.mccoach@uconn.edu). For information about previous and upcoming speakers, please visit https://stat.uconn.edu/online-seminars/ or https://rmme.education.uconn.edu/.

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