



Variational Inference for Cutting Feedback in Misspecified Models

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03.11.2023, 13.00 (c.t.)

Department of Statistics, Ludwigstr. 33, Room 144
and online via Zoom (Link)

(Meeting-ID: 913-2473-4411; Password: StatsCol22)

Bayesian analyses combine information represented by different terms in a joint Bayesian model. When one or more of the terms is misspecified, it can be helpful to restrict the use of information from suspect model components to modify posterior inference. This is called “cutting feedback”, and both the specification and computation of the posterior for such “cut models” is challenging. In this paper, we define cut posterior distributions as solutions to constrained optimization problems, and propose variational methods for their computation. These methods are faster than existing Markov chain Monte Carlo (MCMC) approaches by an order of magnitude. It is also shown that variational methods allow for the evaluation of computationally intensive conflict checks that can be used to decide whether or not feedback should be cut. Our methods are illustrated in examples, including an application where recent methodological advances that combine variational inference and MCMC within the variational optimization are used.

Biography:

Michael Smith holds the Chair of Management in Econometrics at Melbourne Business School. He is a leading researcher in Bayesian statistics, econometrics and business analytics. He completed his PhD at the Australian Graduate School of Management at the University of New South Wales. Prior to joining Melbourne, he held positions at Monash University and the University of Sydney. He has also held visiting positions at Ludwig Maximilians University in Munich, the Wharton School at the University of Pennsylvania, McCombs School of Business at the University of Texas and London Business School. Past major awards include an Alexander von Humboldt fellowship and an Australian Research Council Future Fellowship. His research focuses on developing methods for the analysis of large and complex datasets that arise in business, economics and elsewhere. On the methodological side, he has worked on Bayesian algorithms, spatial and time series analysis and multivariate modelling. On the applied side, he has worked on marketing models for advertising effectiveness and consumer response, neuroimaging, and macroeconomic and business forecasting.