Prediction, skepticism, and the Bayes Factory

A seminar by Leonardo Egidi

Dipartimento di Scienze Economiche, Aziendali, Matematiche e Statistiche - Università degli Studi di Trieste

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Room Benvenuti
Department of Statistical Sciences

Nowadays a Bayesian model needs to be reproducible, generative, predictive, robust, computationally scalable, and able to provide sound inferential conclusions. In this wide framework, Bayes factors still represent one of the most well-known and commonly adopted tools to perform model selection and hypothesis testing; however, they are usually criticized due to their intrinsic lack of calibration, and they are rarely used to measure the predictive accuracy arising from competing models.
We propose two distinct approaches relying on BFs from our most recent research. With regard to prediction, we propose a new algorithmic protocol to transform Bayes factors into measures that evaluate the pure and intrinsic predictive capabilities of models in terms of posterior predictive distributions, by assessing some preliminary theoretical properties (joint work with Ioannis Ntzoufras).
Then, regarding the analysis of replication studies (Held, 2020), we follow the stream outlined by Pawel and Held (2022) and propose a skeptical mixture prior which represents the prior of an investigator who is unconvinced by the original findings. Its novelty lies in the fact that it incorporates skepticism while controlling for prior-data conflict (Egidi et al., 2021). Consistency properties of the resulting skeptical BF are provided together with a thorough analysis of the main features of our proposal (joint work with Guido Consonni).

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