Journal of Probability and Statistics

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Special Issue on

Statistical Inference Using Generalized Maximum Entropy

CALL FOR PAPERS

The entropy measure was first proposed by Boltzmann in the 1870s to measure the information in a distribution that defines the thermodynamic state of a physical system. In 1968, Jaynes was the first to use the entropy as a tool for assigning probability distribution subject to data constraints as a means of solving ill-posed problems, which is denoted by the "Maximum Entropy (MaxEnt) Principle." Facing the fundamental question of drawing inferences from limited or censored data, Jayne's used the MaxEnt principle, which he viewed as a generalization of Bernoulli and Laplace's Principle of Insufficient Reason providing a new insight into defining probabilities via Shannon's entropy measure. This can be done by estimating the unknown distribution of a random variable with minimal assumptions on the underlying likelihood function. Jayne's dice problem is a good practical example. Several estimation methods have been developed with similar philosophy of the MaxEnt, including but not limited to Partial Least Squares, Empirical Likelihood, Generalized Method of Moments, and the Bayesian Method of Moments.

Golan et al. (1996) generalized the MaxEnt methodology to Generalized MaxEnt (GME) to solve the pure inverse problem framework and to estimate the general linear models by minimizing the distance between the information in the data and the prior information about these data. Since then many authors have used the GME to estimate more complicated models; as a consequence the GME starts to be a robust alternative estimation method that could be used by many researchers that considered ill-posed problems.

This special issue aims to deal with the use of the GME estimation method in different models and research areas. A GME estimation methodology has been relevant on several research domains, ranging in statistics, computer science, physics, chemistry, life sciences, econometrics, and social sciences.

Potential topics include but are not limited to the following:

- Entropy measures
- Structural equation models
- Measurement error models
- Sentiment analysis
- Maximum entropy distribution
- Entropy samples
- Information theory
- Cluster analysis
- Machine learning
- General linear models
- Bayesian methods

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