European Network for Business and Industrial Statistics

Contribution ID: **16**   Type: **not specified**

Optimal designs for mixture choice experiments by Simulated Annealing

Wednesday, 18 September 2024 10:25 (20 minutes)

Mixture choice experiments investigate people's preferences for products composed of different ingredients. To ensure the quality of the experimental design, many researchers use Bayesian optimal design methods. Efficient search algorithms are essential for obtaining such designs, yet research in the field of mixture choice experiments is still not extensive. Our paper pioneers the use of a Simulated Annealing (SA) algorithm to construct Bayesian optimal designs for mixture choice experiments. Our SA algorithm not only accepts better solutions but also has a certain probability of accepting inferior solutions. This approach effectively prevents rapid convergence, enabling exploration of a broader experimental region, thus yielding better designs within a given time frame compared to the popular mixture coordinate exchange method. We demonstrate the superior performance of our SA algorithm through extensive computational experiments and a real-life example.

Type of presentation

Talk

Classification

Both methodology and application

Keywords

Choice Experiment; Bayesian Optimal Design; Mixture Experiment

Primary author: MAO, Yicheng (Maastricht University)

Co-author: Prof. KESSELS, Roselinde (Maastricht University)

Presenter: MAO, Yicheng (Maastricht University)

Session Classification: Design of experiments 3

Track Classification: DoE