



# A systematic comparison of continuous and discrete mixture models

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## Abstract

Modellers are increasingly relying on the use of continuous random coefficients models, such as Mixed Logit, for the representation of variations in tastes across individuals. In this paper, we provide an in-depth comparison of the performance of the Mixed Logit model with that of its far less commonly used discrete mixture counterpart, making use of a combination of real and simulated datasets. The results not only show significant computational advantages for the discrete mixture approach, but also highlight greater flexibility, and show that, across a host of scenarios, the discrete mixture models are able to offer comparable or indeed superior model performance.

*Keywords:* Discrete choice; Mixture models; Random parameters; Discrete and continuous distributions.

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## 1. Introduction and context

Allowing for variations in behaviour across decision makers is one of the most fundamental principles in discrete choice modelling, given that the assumption of a purely homogeneous population cannot in general be seen to be valid.

The typical way of allowing for such variation is through a deterministic approach, linking the taste heterogeneity to variations in socio-demographic factors such as income or trip purpose. While appealing from the point of view of interpretation (and

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