

## **ICMC 2022 competition: Is your model the best?**

### **INTRODUCTION:**

Choice modellers often estimate many different models during a study, and then base their output on the best performing model. Previous work by members of the Choice modelling Centre (CMC) illustrated that a key opportunity for the use of model averaging is when a modeller struggles to select a 'final' model when they have a number of advanced models (for example, not knowing which nesting structure to use in a mode-destination choice model, or not knowing which mixing distributions to use in a mixed logit model). The final outputs can then be generated on the basis of a sequential latent class model, where the within class components are the individual models, with parameters fixed at their maximum likelihood estimates from estimation on the full sample as a standalone model (Hancock et al, 2020; Hancock and Hess, 2021).

However, the true power of model averaging lies in the fact that a modeller does not necessarily need to use their own models, and can average across a large number of models designed/specified by different modellers.

Delegates at the International Choice Modelling Conference (ICMC) are invited to take part in a joint effort and competition. They can use any model they want as long as it generates choice probabilities for each alternative in every choice scenario in the database (i.e. probabilistic outcomes, not deterministic).

### **INCENTIVE:**

Analysts with a contribution receiving an overall score **above the mean** will be invited to become **co-authors** ahead of submitting this work to a journal (a minimum of three will be invited), while a **free registration** to ICMC will be offered to one member of the team who achieve the **highest overall score**.

### **EVALUATION:**

Three datasets will be provided, one RP, one SP, and one simulated, all with equal weight. Analysts are encouraged to work with all three datasets as this will lead to a higher score for their entry.

The CMC team will score the contributions by individual analysts/teams using three different categories:

- (50%) Contribution of the models during the model averaging process across the three provided datasets, i.e. what share does the model obtain in the overall model averaging structure that combines the contributions from all participants in the competition.
- (25%) Performance on hold-out samples that were not available to analysts during model building.

- (25%) Ease of obtaining behavioural insights from the models: (a) the ability to easily compute outputs that can be used for economic analysis (such as willingness to pay) and (b) the ability to easily compute demand elasticities. Analysts should write a brief paragraph explaining how to do this with their models when submitting their entry.

#### **WHO:**

Any individual or research team may take part in the competition (you need not have submitted work to ICMC 2022). To register interest in taking part, analysts should [sign up here](#), after which they will be given access to the data.

#### **SUBMISSION OF MODEL RESULTS:**

Analysts need to submit details to [toh.cmc@gmail.com](mailto:toh.cmc@gmail.com) on their:

- Model type.
- Likelihoods at the individual decision-maker level.
- A summary paragraph on the model, explaining the ease of obtaining behavioural insights from the models.

#### **WHEN:**

The deadline for submitting model results is the **1<sup>st</sup> of April, 23:00 PST**.

#### **QUESTIONS:**

Please contact Thomas Hancock ([T.O.Hancock@leeds.ac.uk](mailto:T.O.Hancock@leeds.ac.uk)) if you have any questions about the competition.

#### **REFERENCES:**

Hancock, T. O., Hess, S., Daly, A., & Fox, J. (2020). Using a sequential latent class approach for model averaging: Benefits in forecasting and behavioural insights. *Transportation Research Part A: Policy and Practice*, 139, 429-454.

Hancock, T. O., & Hess, S. (2021). What is really uncovered by mixing different model structures: contrasts between latent class and model averaging. *European Journal of Transport and Infrastructure Research*, 21(3), 38-63.