

Modelling Mode Choice Behaviour Using Cloud Theory

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Abstract : Mode choice models are crucial instruments in the analysis of travel behaviour. These models show the relationship between an individual's choice of transportation mode for a given O-D pair and the individual's socioeconomic characteristics such as household size and income level, age and/or gender, and the features of the transportation system. The most popular functional forms of these models are based on Utility-Based Choice Theory, which addresses the uncertainty in the decision-making process with the use of an error term. However, with the development of artificial intelligence, many researchers have started to take a different approach to travel demand modelling. In recent times, researchers have looked at using neural networks, fuzzy logic and rough set theory to develop improved mode choice formulas. The concept of cloud theory has recently been introduced to model decision-making under uncertainty. Unlike the previously mentioned theories, cloud theory recognises a relationship between randomness and fuzziness, two of the most common types of uncertainty. This research aims to investigate the use of cloud theory in mode choice models. This paper highlights the conceptual framework of the mode choice model using cloud theory. Merging decision-making under uncertainty and mode choice models is state of the art. The cloud theory model is expected to address the issues and concerns with the nested logit and improve the design of mode choice models and their use in travel demand.

Keywords : Cloud theory, decision-making, mode choice models, travel behaviour, uncertainty

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