

## MODELING STATED TRAVEL AND HOUSING CHOICE BEHAVIOR BY UNIFORM DESIGN

### 均匀设计在交通及住房决策行为中的应用

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#### Abstract

Conjoint models have become an established modeling tool for geographical studies such as transport and housing studies. At the core of conjoint models is experimental design, which combines attributes into profiles according to statistical principles. Orthogonal design is the widely used method of experimental design. This method, however, has the problem that task sizes rapidly increase with increasing numbers of attributes and/or levels. Efforts have been spent to overcome this problem, but all existing proposals are based orthogonal design, providing no radical solution to the problem. In this paper, we attempt to deal with the problem using a new experimental design method that has recently attracted the attention of international statisticians – uniform design, a method that can easily deal with large numbers of attributes and/or levels. The basic idea of this method is to select experimental points (or profiles) that are uniformly scattered in the problem domain. This is based on the theorem that uniformly distributed experimental points will ensure that the estimated model has the minimum gap with the true model. The key of uniform design is therefore to select designs that have maximum uniformity, which indicates to what extent the experimental points provided by a design are uniformly distributed. The application of this new method is illustrated and tested by two case studies: the case of inter-city (Hong Kong-Guangzhou) transport mode choice and the case of housing choice in Beijing.