Regret-based models of mobility (451-10-001)

Funding: National (Netherlands)
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Status: Complete with results

Background & policy context:
The desire to understand mobility has been a central motivation for the development of so-called discrete choice-theory. Over the years, this Nobel prize-winning econometric modelling approach has shown to be very effective in predicting choices of individual travellers as well as aggregate mobility patterns. The large majority of discrete choice-models are built on utility-maximisation decision rules.

Objectives:
The proposed research pushes the envelope of a new, regret-minimisation based discrete choice-model class recently proposed by the applicant. The approach is based on the premise that people, when choosing, aim to avoid the situation where one or more non-chosen alternatives perform better than the chosen one on one or more attributes.

Compared to utility-based models, the regret-based approach allows for substantial increases in realism and predictive performance, while displaying a high level of econometric tractability. As such, regret-based discrete choice-theory provides a particularly effective modelling approach which may help scholars and policy-makers better understand, predict and manage mobility.

Methodology:
The proposed research aims to provide methodological breakthroughs and substantive insights regarding regret-based modelling of mobility. In particular, it aims at providing the following innovations:

1) Extension of regret-based discrete choice-models towards capturing learning dynamics and choice from ordered alternatives.
2) Derivation of a regret-based measure of accessibility, and a regret-based stochastic user equilibrium in transport networks.
3) Integration of the regret-based approach in transport network-optimisation models.

Derivation of empirical insights into the role of regret minimisation in traveller decision-making and into the potential of the developed regret-based approach as a model of mobility. Data is collected using stated choice-experiments and an interactive travel simulator-experiment.

Parent Programmes:
NWO - The Netherlands Organisation for Scientific Research (NWO)

Institute type: Research agency
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Partners:
Technische Universiteit Delft, Faculteit Techniek, Bestuur en Management, Transportbeleid en Logistieke Organisatie

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Key Results:

**Scientific article**

12. CG Chorus (2013): Regret, rejoice, and convex demand for quality: Paving the way for superstars *Medium Econometrische Toepassingen* pp. 2 - 11
13. CG Chorus, M Bierlaire (2013): An empirical comparison of travel choice models that capture preferences for compromise alternatives *Transportation* pp. 549 - 562

**Chapter in book**


**Book or monography**


**Professional publication**


**STRIA Roadmaps:** Smart mobility and services
Transport mode: Multimodal transport
Transport sectors: Passenger transport, Freight transport
Geo-spatial type: Other