

## Discrete Choice Analysis: micro-econometrics and machine learning approaches

<b>Date:</b>	<b>8, 10 &amp; 11 September 2020</b>
<b>Time:</b>	<b>09:30 – 17:00 h.</b>
<b>Location</b>	<b>TU Delft, room t.b.d.</b>
<b>Course leaders:</b>	<b>Prof. dr. ir. C. G. Chorus (DUT) &amp; Dr. ir. S. van Cranenburgh (DUT)</b>
<b>Days:</b>	<b>3</b>
<b>ECTS:</b>	<b>2 ECTS (attendance, including assignments)</b>
<b>Course fee:</b>	<b>Free for TRAIL/Beta/OML members, others please contact the TRAIL office</b>
<b>Registration:</b>	<b><a href="http://www.rstrail.nl">www.rstrail.nl</a></b>

### General aim

Discrete choice analysis (DCA) has become one of the most important frameworks for transportation modelling. Using DCA, the researcher or analyst is able to estimate the influence of all sorts of factors on travel choice behavior, and to predict mobility patterns and market shares for transport-related services; all this, in a quantitative, statistically rigorous way with deep roots in economics and the behavioral sciences. As such, DCA is indispensable for the underpinning of many transport policies and plans.

In this course, we will cover two different perspectives on DCA: the conventional, econometrics-based perspective (also called Discrete choice theory); and a more novel perspective which is gaining ground rapidly, based on recent advances in Machine learning (more specifically, Artificial neural networks). This combination makes this course unique, compared to other choice modelling courses taught in the Transport community.

This course will contain a mix of theory, implementation guidelines, and hands-on exercises to be completed during the course and under supervision of the lecturer.

### This course covers:

#### *Day 1 – Basics of Discrete choice theory*

- Specification and estimating a discrete choice model
- The Logit-model based on Random Utility theory
- Economic appraisal with discrete choice models
- Exercise 1 (Biogeme)

#### *Day 2 – Advances in Discrete choice theory*

- The Mixed Logit-model (error components, random parameters, and panel effects)
- Models of Bounded rationality (regret) and Moral decision making (taboos)
- Exercise 2 (Biogeme)

#### *Day 3 – Artificial neural networks for Discrete choice analysis*

- Introduction into ANNs
- Using ANNs to explore decision rule heterogeneity
- Using ANNs to determine travelers' Value of Time
- Exercise 3 (Matlab)

### Course programme

To be determined.

### ECTS:

Participants of this course will be awarded with 2 ECTS when attending the full course, and having completed the associated exercises (one for each day).