

Presentation of TRANSP-OR

Decision-aid Methodologies in Transportation

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Who we are

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Discrete Choice

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Discrete Choice

... and what they are doing

ELECTRIC VEHICLE ADOPTION DYNAMICS: EXPLORING MARKET POTENTIALS



This project proposes innovative methods to identify the determinants of acceptance of alternative vehicles and their impact on everyday mobility.



The greatest challenge faced by the promoters of the transition towards this low carbon engine

technology lies in understanding how consumers accept the financial and lifestyle investments associated with the leap from traditional to electric powertrains. This project proposes innovative methods to identify the determinants of acceptance of alternative vehicles and their impact on everyday mobility. A deeper understanding of adoption dynamics is critical to predict who will opt for EVs when and under which conditions.

This project will focus on innovative data-collection and modelling methodologies to uncover the acceptance of EVs at different stages of market-penetration (considering inexperienced/experienced users, early pioneers/late-adopters). A thorough analysis of the consumer decision-making process will lead to uncovering the barriers and success factors related to EV uptake and to forecast buying and usage behaviours related to new vehicle classes.

REVISITING THE ROUTE CHOICE PROBLEM: A MULTI-LEVEL MODELING FRAMEWORK FOR ROUTE CHOICE ANALYSIS BASED ON LATENT CONSTRUCTS



This project aims at developing behavioral models integrating the latent constructs that



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drive travel behavior. The objective of the project is to set the foundations of an innovative framework that facilitates the analysis and prediction of route choice behavior. Motivated by the complexity of the route choice models, we build on solid ground of the current state of the art and add on it by proposing a new approach that reduces model complexity and brings great flexibility to the analysis. The approach is inspired by the fact that people break down the complexity of the environment by forming

representations of their surrounding space. Following this reasoning, we replace the conventional representation of routes which is based on paths, i.e. link-by-link sequences on the network model, with more aggregate elements that we denote as mental representation items. This key feature of the framework allows us to reduce the complexity of the model and at the same time is more behaviorally realistic.

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Pedestrians

... and what they are doing

DRIVE FOR YOU: A DRIVING ASSISTANT TOOL TO DETECTING PEDESTRIANS



This project aims to develop an onboard pedestrian tracking system to assist the driver detect them and, ultimately, to increase security.

The project, with a duration of four years, will focus on pedestrians detection, tracking and trajectory prediction, and will be

closely related to vehicle command strategies. The project is part of the automated driving research Chair "Drive for you" led by MINES ParisTech in partnership with French industrialists and three prestigious academic institutions the Ecole Polytechnique Fédérale de Lausanne EPFL (Switzerland), the University of Shanghai Jiao Tong (China) and the University of Berkeley (USA). Supported by the Foundation MINES ParisTech, with Valeo industrial, PSA Peugeot Citroën and Safran contributing 3.7 million euros in funds, the Chair will work for five years on the subject of automated driving. The three main objectives are expand knowledge of self-driving vehicles, develop intelligent onboard systems, get self-driving vehicles on the road in Asia, Europe and the United States.



... and what they are doing

POSTCARWORLD: A TRANS-DISCIPLINARY MULTI-DIMENSIONAL STIMULATION



POSTCARWORLD

The goal of this project is to explore the future of mobility through the role of the car.

The main originality of this research is to raise the following problem: "What, if the world were a post-car world". The basic idea is to define a hypothetical situation where the place of the car would have been dramatically reduced and to use qualitative and quantitative simulation methods to examine the consequences of this initial hypothesis. The research is based on the idea that by simulating the future through scenarios we can understand the present better. This project is fully interdisciplinary and trans-disciplinary. It brings together social sciences, engineering sciences, urban planning and urban design in six different laboratories associated to three different universities.



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The role of TRANSP-OR in this project is to study and optimize an innovative transport system based on accelerated moving walkways (AMW). Differently from constant moving walkways, AMW can reach speeds up to 15km/h thanks to an acceleration section. The project aims to identify the optimal design of a network of AMW using optimization. A network of accelerated moving walkway in a car-free urban environment may present an innovative solution, and this project could delineate the system feasibility.

Operations research

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... and what they are doing

AIR NAVIGATION PLATFORM: FLIGHTS PLANNING BY USING REAL-TIME WEATHER DATA



Flying safer, cheaper, faster are keywords of this new service. This project aims at integrating an automatic route planning system, tightly coupled with the real-time meteorological data, taking into account energy consumption of the mobile device hosting the application. The route will be computed in



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real time on mobile devices using the information of weather forecast and respecting to the constraints such as airspace/airport restriction and terrain avoidance, etc. The energy efficient implementation of the routing application is crucial, to provide routing information to the pilot during the entire trip. This becomes challenging, as automatic route planning often requires complex algorithms. In this project, we will target at a three-dimensional flight route-planning problem and design an efficient but robust algorithm to solve the problem. The project will last 18 months. It is conducted by TRANSP-OR in collaboration with the Xample Sàrl, ICARE Institut de recherche and Haute Ecole Spécialisée de Suisse Occidentale (HES-SO).

... and what they are doing

MODULAR LOGISTICS UNITS IN SHARED GO-MODAL NETWORKS



The objective is to achieve the first genuine contribution to the development of intercontinental logistics at the European level, in close coordination with North America partners and the international Physical Internet Initiative. The goal of the project is to enable operations with developed iso-modular logistics units of size adequate for real modal and co-modal flows of fast-moving consumer goods, providing a basis for an interconnected logistics system for 2030.



The main courses we offer

- Fall
 - Introduction à l'optimisation (bachelor)
Lecturer: Michel Bierlaire
 - Mathematical modeling of behavior (master)
Lecturer: Michel Bierlaire
- Spring
 - Decision-aid methodologies in transportation (master)
Lecturer: Matthieu de Lapparent, Shadi Sharif Azadeh
 - Enjeux mondiaux (bachelor)
Lecturer: Michel Bierlaire
 - Optimization and simulation (doctoral)
Lecturer: Michel Bierlaire

Projects for students

We can be flexible with the number of credits that the student needs.
The projects are offered as semester projects or master theses.

Projects for students

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Projects for students
Videos
Optimization and simulation (PhD)
Recherche opérationnelle (BSc)



TRANSP-OR



Expertise

Transportation Research
Operations Research
Discrete Choice Models

Methods

Modeling, optimization, simulation

Directed by **Michel Bierlaire**, the Transport and Mobility Laboratory is active in modeling, optimization and simulation of transportation systems, with a specific emphasis on the mobility of individuals.

RESEARCH

Transport & Land Use Modeling for Sustainable Cities

Michel Bierlaire, André de Palma, Ricardo Hurtubia, Paul Wadell (Eds.)

New book on integrated transport and land use models

10.03.15 As an output of the European project SustainCity, EPFL Press has just released the book "Integrated Transport & Land Use Modeling for Sustainable cities", edited by Michel Bierlaire (EPFL), André ... »

EPFL



Ricardo Hurtubia appointed Assistant Professor

10.03.15 Ricardo Hurtubia has been appointed Assistant Professor at Pontificia Universidad Católica de Chile, with a dual appointment to the School of Architecture and the Department of Transport Engineering and Logistics. ... »

CONTACTS

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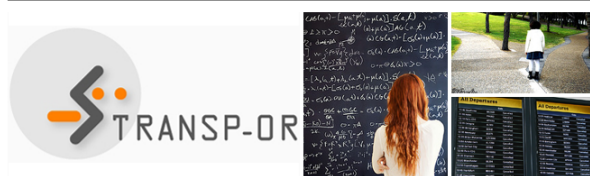
HOT LINKS

» [EURO Journal on Transportation and Logistics](#)

» [Discrete Choice Analysis: Predicting Demand and Market](#)

TRANSPORT AND MOBILITY LABORATORY: PROJECTS FOR STUDENTS

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[Network design for electric buses](#)

[Strategic energy planning: optimization under uncertainty](#)

[Demand model of strategic customers](#)

[The threshold of danger: analysis of pedestrian trajectories on train station platforms](#)

[Development of a novel pedestrian walking model applicable to congested flows](#)

[Data fusion in purchasing behavior](#)

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November 11, 2014

June 12, 2014

Expertise

Transportation Research

Operations Research

Discrete Choice Models

Methods

Modeling, optimization, simulation

COMMENTS

Click on the project title to obtain the description.

If you are interested in a project, contact the person in charge

Projects are sorted from the most recent to the oldest.

It is possible that old projects may not be relevant anymore.

Projects can in general be calibrated to correspond to the number of credits required by your section.

Some projects can also be considered for the MSc thesis.

We wish you a successful preparation
for your final exam.