Chair of Transportation Systems Engineering
TUM School of Engineering and Design
Technical University of Munich

AI-Based Mode Choice Modeling for Urban Air Mobility as an Airport Shuttle Service

1 Background

The integration of Urban Air Mobility (UAM) as an airport shuttle service is a significant step in the evolution of transportation systems. Understanding the mode choice behavior of passengers is crucial for the successful implementation and operation of such services. This research will focus on the application of AI-based approaches to model the mode choice behavior using a survey dataset.

2 Objective

The objective of this research is to apply AI-based approaches, such as decision tree, neural network, and clustering algorithms, to model the mode choice behavior of passengers for UAM as an airport shuttle service. The different mode choice models will be compared and selected.

3 Methodology

1. Data Analysis: Analyze the survey dataset to understand the mode selection, attributes of the passengers, and attributes of the trips.
2. Model Development: Develop models using decision tree, neural network, and clustering algorithms to predict the mode choice behavior.
3. Model Evaluation: Evaluate the performance of the models using appropriate metrics and select the best mode choice model.
4. Market Share Prediction: The selected choice model will be utilized to predict the future market share for the airport shuttle services.
5. Insights Extraction: Extract insights from the models to understand the factors influencing the mode choice behavior.

4 Expected Outcomes

1. A comprehensive understanding of the mode choice behavior for UAM as an airport shuttle service.
2. AI-based models that can predict the mode choice behavior with high accuracy.
3. Insights into the factors influencing the mode choice behavior.

5 Skills Required

- Fluency in English or German.
- Ability to work independently.
- Strong knowledge of AI-based approaches, especially decision tree, neural network, and clustering algorithms.
- Previous experience with data analysis.
- Knowledge of the scripting programming language python (or R).

6 Relevant Work

- Rothfeld, R. L., Balac, M., Ploetner, K. O., & Antoniou, C. (2018). Agent-based Simulation of Urban Air Mobility. 2018 Modeling and Simulation Technologies Conference, 1 –10.
- For additional information regarding the “AMI-AirShuttle” research project, please visit the following link: AMI-AirShuttle

7 Starting Date

As soon as possible

8 How to Apply

If you are interested, please email your resume and start date to Hao Wu (wu.hao@tum.de) and Cheng Lyu (lyu.cheng@tum.de).