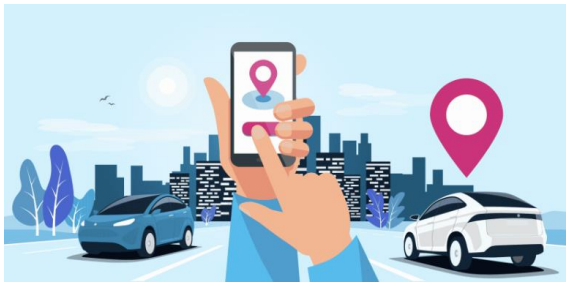
Stable Matching in Shared Mobility Systems



Problem description

Shared mobility platforms like Uber, DiDi, and Lyft offer a sustainable alternative to traditional vehicle ownership, potentially reducing traffic congestion, greenhouse gas emissions, and air pollution. Operating in a market environment, these platforms give drivers and riders the autonomy to accept or decline the matched rides. However, recent data from these platforms indicate a growing rate of declined rides. This suggests that existing matching algorithms are not stable, as they might not adequately capture the specific preferences and ride acceptance behaviors of the platform users. To this end, the objective of this project is to design an efficient and stable ride-matching algorithm by leveraging past traveler behavioral research, with the goal of better aligning ride offers with the preferences of drivers and riders. By achieving this, we anticipate a reduction in declined rides, fostering a more reliable and stable shared mobility environment.

Assignment

The assignment involves the following tasks:

- Review past research on ride-matching and the behavioral patterns of both drivers and riders. Identify key features that affect ride acceptance or decline
- Propose and design an optimization model that integrates insights from the reviewed behavioral data to improve the matching rate
- Compare the designed model with the existing matching models
- Compile findings and methods into a comprehensive report

Candidate

The ideal candidate should:

- have affinity and interest in mathematical modelling
- have coding skills in Python or similar

Research group

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