Microsimulation of an Autonomous Taxi-System in Munich

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Autonomous Taxis (aTaxis)

Research Questions and Framework

First Simulation Scenarios

Investigation of Traffic Impacts

Investigation of More Realistic Traffic and Imperfect Knowledge on Fleet Performance

Implementation of Autonomous Taxi System in a Traffic Microsimulation

Interface: Traffic Microsimulation & aTaxi Module

Automotive Taxis (aTaxis)

Traffic impact of induced empty trips

impact of delay on fleet performance

Travel Times:

Estimated TT: 24.2 (0.1) min

Travel Times: NoMicroSim: 90.1 (2.1) min

Simulation time period 05:00 – 11:00

Selection of Model Assumptions

Limitations and Planned

Framework

Basis

100

7715 (19)

1238 aTaxis

50

7577 (14)

3200

Private

9.6 (0.1)

100%

2400

100%

25 km x 30 km

Previous Studies

- Big Players
  - Uber
  - Lyft
  - Waymo

Possibly Disruptive Technology

- Uber
  - self-driving cars

Operation Schematics

Network Information:

- Location
  - Traffic Microsimulation: Destination
  - aTaxi Module: Origin

- Traffic Volume
  - Traffic Simulation: NoMicroSim
  - aTaxi Module: NoMicroSim

- Real Volume
  - Real Simulation: NoMicroSim
  - aTaxi Module: NoMicroSim

- Interface: Traffic Microsimulation & aTaxi Module

- Estimated TT

- ETA computed by fleet operation algorithm

- Real waiting time for actual vehicle arrival

- Penalty time for vehicle O/D matrix

- Average Fleet

- Average Fleet

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