



SAEV Fleet Management

Master's Thesis

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Introduction and Problem Description

Shared Autonomous Electric Vehicles (SAEV) will be the future of urban mobility. There is a wide range of research carried out to make SAEV a reality. SAEV fleets help to mitigate climate change and improve road safety. Refer [1] for a comprehensive literature survey of the current state-of-the-art.

SAEV fleet management studies make assumptions to simplify the problem. Some of the constraints such as AV maintenance, battery degradation, electric grid stability etc., are often ignored or addressed in isolation. In this thesis, an attempt will be made to study the problem on a realistic traffic simulator with minimal assumptions. A comparison with existing approaches will be made.

Task Description

- Identify potential gaps in SAEV fleet management.
- Select the constraints to evaluate
- Generate solutions and compare with existing implementation(s)

Requirements

- Control theory, Discrete Optimization
- Good programming skills in C++/Python

References

- [1] Zardini, G., Lanzetti, N., Pavone, M., and Frazzoli, E. "Analysis and Control of Autonomous Mobility-on-Demand Systems". In: *Annual Review of Control, Robotics, and Autonomous Systems* 5 (2022), pp. 633–658. ISSN: 25735144. DOI: [10.1146/ANNUREV-CONTROL-042920-012811](https://doi.org/10.1146/annurev-control-042920-012811). URL: <https://doi.org/10.1146/annurev-control-042920->.