

Master's Thesis

Dude, where's my car?

When parking, it is common for people to forget the exact location of their vehicle. Especially in parking garages, finding the car upon returning can be problematic due to the amount of vehicles, multiple levels, repetitive architecture, and the lack of reception for satellite positioning systems.

While it is easily possible to memorize the location, or note it somewhere, this does not help after the fact. Other technical solutions exist, however, these often are specific to a parking garage operator and might need the user to install different applications on their smartphones.

In this context, Vehicular AdHoc Networks (VANETs) could help to provide a general solution. Localization relative to neighbors using wireless signals is a well researched topic, and in a parking garage, there are plenty of other vehicles available.

Therefore it is likely feasible to discover a path from end-users to their vehicles based solely on wireless communication, as is available in modern vehicles. This would enable users to simply follow a path that is generated for them on demand, without any support of infrastructure.

■ Goals of the Thesis

The goal of this thesis is to explore this possibility in detail. Your work will entail the following tasks:

- Work with related work to determine the state of the art of wireless localization.
- Create a suitable simulation as a testbed for your approaches.
- Develop one or multiple approaches to discovering possible routes.
- Determine useful parameters and metrics to evaluate your approach(es).
- Conduct a parameter study to determine your approach's/approaches' performance .

■ Relevant Knowledge/Skills

The thesis will touch on/require these skills, if you are not familiar with these you will need to familiarize yourself with them during the thesis.

- Programming (Python and/or C++)
- Basic understanding of wireless networking and signal propagation
- Statistics