

Master Thesis

Simulation and Modeling of Autonomous Robots in the Context of Urban Logistics



Introduction: The IFL participates in various projects exploring autonomous robotics for urban logistics, like *efeuCampus* and *LieferbotNet*. These initiatives develop vehicle platforms and algorithms for last-mile delivery in collaboration with academic and industrial partners. The focus is on autonomous driving in new contexts, such as sidewalks and city centers. Notably, these endeavors are not confined to theory; a real-world laboratory established in Bruchsal facilitates practical testing of research findings and encourages exchange with future customers and stakeholders.

Problem Statement: Robot simulation enables faster development cycles and allows for easier application of data-driven methods in this context by supplying synthetic data. However, due to the unique requirements, available simulation tools do not accurately represent the discussed robots and their environment. Therefore, you will be extending existing simulation modules and develop new methods to represent various aspects of the system, for example sensor-environment interaction or human behavior. We offer a broad spectrum of research topics within the simulation and modeling domain.

Required Skills: Interest in simulation and modeling as well as autonomous robotics; Programming experience in python and ROS is beneficial.

Benefits: You will be working closely with a young, dynamic, and enthusiastic team of researchers and students on industry-relevant topics. Your contributions are directly applied in various projects and research topics. Furthermore, we offer extracurricular workshops on scientific writing, software engineering and more. Supervision includes weekly meetings with your supervisor and team.

Research Group:

Robotics and Interactive Systems

Thesis Type:

Simulation, Experimental Study

Majors:

Mechatronics, Computer Sciences, or similar

Start Date:

Immediately

Language:

German/ English

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