Karlsruher Institut für Technologie

IFL
Institut für Fördertechnik und Logistiksysteme

Bachelorthesis/ Masterthesis

Development of a Simulation Model for Thermal Cameras in Outdoor Environments

Field: Multimodal perception setups can significantly outperform conventional computer vision methods, especially in challenging and dynamic outdoor environments. Thermal cameras are increasingly applied in autonomous vehicles, environmental monitoring, and more. However, real-world testing is costly, time-intensive, and constrained by environmental factors. A realistic simulation model for thermal cameras under varying outdoor conditions (temperature, weather, time of day) will enable faster, more cost-effective development and testing.

Problem Statement: You will review existing methods for modeling thermal cameras and implement them within a simulation environment. Based on these baselines, you will enhance the model's performance and validate it using statistical methods and real-world datasets.

Required Skills: Basic Knowledge of computer vision and image processing, programming skills in python or C++. Experience with simulation environments (e.g. Nvidia Isaac, CARLA) is a plus.

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 to 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:
Mobile Agents and Robotic Systems

Thesis Type:
Experimental Study, Simulation

Majors:
Mechanical Engineering, Mechatronics

Start Date:
immediately

Language:
German/ English

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Contact:
Lars Ohnemus
Bld. 50.38; Room 1.12
+49 721 608 48656
lars.ohnemus@kit.edu