Karlsruher Institut für Technologie

Institut für Fahrzeugsystemtechnik
Institutsteil Mobile Arbeitsmaschinen

Prof. Dr.-Ing. Marcus Geimer

MOBIMA
MOBILE ARBEITSMASCHINEN

Masterarbeit

Sensor-Based Track recognition using Neural Networks on Skid Roads

In forestry, the use of heavy machinery is part of daily practice for timber extraction. When driving on skid trails (forest roads), tracks and hollows are inevitably formed on these trails.

To assess the damage behavior, an analysis of these tracks is necessary, which, until now, has largely been conducted manually due to a lack of automation.

As part of this thesis, the focus will be on investigating to what extent the resulting tracks can be detected using camera recordings and LiDAR data. First, the track on the skid road will be delineated. Subsequently, an algorithm for the automatic detection of these tracks will be developed and validated based on already recorded experimental data.

Planned Tasks:

- Reserarch and familiarization with this topic
- Delineation of the trac on the skid road
- Development and validation of the implemented method
- Evaluation of results
- Documentation and presentation of results

If you are interested in this topic, feel free to get in touch. The scope of the work can be adapted or extended based on your individual strengths and interests.

Type of Thesis:

- Focus: Algorithm Development, Data Processing, Sensor Technology
- Fields: Forest Machinery Technology, Computer Science

Start and Duration:

- Start: To be agreed upon
- Duration: 6 Months

Prerequisites:

- Interest in programming and sensor technology
- High degree of independence and motivation
- Good academic performance
- Very good writing skills in German or English
- Programming knowledge in ROS2, Python or C++ is an advantage

Contact Person: M.Sc. Xholjon Dede, ☎ 0721 608-41826, ✉ xholjon.dede@kit.edu

Ausgabedatum: 30.07.2026