

Master Thesis Opportunity at CAS “*Design real robots that cooperate in real traffic — and evaluate them like a researcher.*”

Design and Evaluation of Cooperative Multi-Robot Traffic Scenarios Using V2X Communication

Motivation:

Future urban environments will be shared by vehicles, pedestrians, and mobile robots. While vehicles already cooperate using V2X communication, mobile robots are rarely considered as active traffic participants.

This thesis offers the opportunity to design, implement, and evaluate real-world multi-robot traffic scenarios, contributing to next-generation Connected, Cooperative, and Automated Mobility (CCAM) systems.



Pal Robotics (ARI Robot)



Unitree Go2 Robot

What You'll Do:

As a master's student, you will take ownership of a research-driven robotics project:

- **Scenario Design:** Define 3-5 realistic outdoor traffic scenarios with 2 robots (shown in the pictures).
- **System Implementation:** Implement decentralized robot-to-robot coordination, integrate perception-based events (e.g., pedestrian detection, obstacles) if needed.
- **Metric Design & Evaluation:** Research and develop performance metrics for evaluation.
- **Research Output:** Produce a master's thesis with publication-quality experiments and option to contribute to open-source frameworks.

Who We're Looking For:

- Strong programming skills, particularly in Python.
- Experience with ROS1 and ROS2.
- Familiarity with V2X Communication and Outdoor experiments.
- Strong analytical mindset and problem-solving abilities.
- Effective communication skills for documentation and presentation purposes.

Why Apply?

This thesis offers an opportunity to work on a cutting-edge intersection of robotics and transportation. Your work will contribute to safer and future CCAM systems and traffic environments. Join us in shaping the future of mobile robotics!

Ready to take off? Apply now! Send your application to john.arockiasamy@kit.edu. **ASAP!**



Contact for more Info @