

**Master Thesis Opportunity at CAS** 🚀 *Shape the Future of Intelligent Transportation!* 🚀

## ***Development of a Simulation Environment Integrating unmanned aerial vehicles (UAVs) into the Artery Framework for V2X Communications.***

### 🌍 **About the Thesis:**

In the rapidly evolving landscape of intelligent transportation systems (ITS), Vehicle-to-Everything (V2X) technology stands at the forefront, enabling seamless communication between vehicles and their environment to enhance traffic efficiency and safety. The Artery simulation framework [1], built upon the SUMO traffic simulator and OMNeT++, serves as a pivotal tool for modelling V2X communications. However, a notable gap exists: the integration of UAVs, such as drones, into this simulation environment. This master thesis aims to bridge this gap by integrating drone physics into the Artery. This integration aims to facilitate comprehensive V2X simulations that include both ground vehicles and aerial drones, enabling the exploration of new communication paradigms within ITS.

### 🎯 **What You'll Do:**

1. **Literature Review:** Explore existing methods for simulating UAVs in traffic frameworks.
2. **Simulation Development:** Extend Artery to model UAV dynamics accurately.
3. **Communication Modelling:** Design or adapt messages for UAV to vehicle interactions.
4. **Validation:** Simulate and analyse various scenarios of UAV to vehicle interactions for integration effectiveness.
5. **Documentation:** Compile documentation about the integration process, challenges faced, solutions implemented, and future recommendations.

### 🔍 **Who We're Looking For:**

- Strong programming skills, particularly in C++ and Python.
- Familiarity with simulation tools, especially SUMO, OMNeT++ and Artery.
- Understanding of UAV dynamics and V2X communication protocols.
- Analytical mindset with the ability to conduct independent research.
- Effective communication skills for documentation and presentation purposes.

### 🎓 **Why Apply?**

This thesis offers a chance to drive innovation in ITS. By integrating UAVs into V2X simulations, you'll help shape the future of safer, smarter, and more connected mobility. Join us in this exciting endeavour to elevate ITS to new heights.

💡 *Ready to take off?* Apply now! Send your application including CV and Master's transcripts to [john.arockiasamy@kit.edu](mailto:john.arockiasamy@kit.edu) or in-person at John Pravin Arockiasamy - Room: 5A-05.1 (Building 05.20).  
**Starting Date: ASAP!**

### 📌 **Reference:**

1. "Artery V2X Simulation Framework." n.d. Artery.v2x-Research.eu. <http://artery.v2x-research.eu/>.