# Internship proposal (4 or 6 months)

## Simulation platform for formations of drones connected using 5G-V2V

(Reference WCSIN031)

**Internship supervisor**

Mitsubishi Electric R&D Centre Europe**:** Arnaud Bouttier, Senior Research Staff

**Overall context**

Set up in the middle of the scientific campus of Rennes, the capital of Brittany, the French branch of Mitsubishi Electric R&D Centre Europe provides advanced R&D support to the Japanese R&D centres and to the business units of Mitsubishi Electric Corporation. Within the Communications and Information Systems division, our Wireless Communication Systems team focuses its research interests on wireless communications for factory automation, automotive, railway, satellite, and access network fields. We combine long-term research with applied research resulting in contributions in international standards and development of proprietary technologies for in-house products. The proposed internship falls in the scope of the *distributed collaboration* research pillar of the CIS/WCS team where automated agents rely on the 5G Vehicle-to-Vehicle (V2V) radio transmission technology to achieve their tasks.

**Internship subject**

More specifically, the proposed internship deals with applications involving formations of automated and connected drones and more generally Unmanned Aerial Vehicles (UAVs). The goal is to develop a simulation platform of UAVs formations using AirSim (or a side project such as Cosy-AirSim), a simulator for drones, cars and more, built on Unreal Engine with support of ROS, sensors, software-in-the-loop, etc. In addition to deploying, configuring, and validating the platform for a few test scenarios, the main task of the internship is to add the support of 5G V2V radio transmissions between the drones through the integration of a 5G-V2V system level simulator developed by MERCE in Matlab and/or the 5G-Lena C++ simulator (built on top of the network simulator ns-3). The objective is to design a platform enabling the deployment of drones that use 5G-V2V to implement applications such as distributed trajectory planning, autonomous driving, etc., altogether with the ability to generate datasets for Deep Learning purposes.

**Prerequisites**

- Solid development skills in C/C++, Python and Matlab
- Interest in robotics
- Basic knowledge about Unreal Engine is welcomed
- Autonomy
- Good skills in English (read and written)

**Duration: 4 or 6 months**

**Period:** school year 2024/2025 from Sept at the earliest (depending on schools' internships periods)

**Contact:** Magali BRANCHEREAU ([jobs@fr.merce.mee.com](mailto:jobs@fr.merce.mee.com))

Thank you to provide us an application letter and your CV mentioning the reference of the internship.

The signature of an Internship Agreement with your school is mandatory.