

# Understanding of the SORA process and risk categories for the simulation system design and development team. Modeling of non-cooperative and cooperative traffic for one or more entities.

Record number : OPR-1132

## Overview

### RESEARCH DIRECTION

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### INFORMATION

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### RESEARCH CO-DIRECTION

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### INFORMATION

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### ADMINISTRATIVE UNIT(S)

Faculté de génie  
Département de génie électrique et de génie informatique  
Département de génie mécanique  
Institut interdisciplinaire d'innovation technologique (3IT)

### LEVEL(S)

3e cycle

### LOCATION(S)

3IT - Institut interdisciplinaire d'innovation technologique  
Campus de Sherbrooke

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## Project Description

Research project :

AIRGIFT - Simulation Environment for BVLOS Mission Risk Assessment and SORA Process Automation

Université de Sherbrooke, CAE and Unither Bioelectronics are launching a partnership to explore the automation of mission risk analysis based on the generation of synthetic data from a simulator. The aim is to accelerate the SORA (Specific Operational Risk Assessment) mission risk analysis process for the future of air mobility.

Research direction :

Pr François Ferland, Pr David Rancourt and Pre Adina Panchea.

Background and research project:

Numerical simulations are widely used in the aeronautics industry, for example to analyze fuselage integrity or even the risk of collision with birdlife in the vicinity of an airport. However, there is no integrated method for numerically analyzing the risk associated with drone operations beyond visual line-of-sight (BVLOS), a necessary step in the Specific Operational Risk Assessment (SORA) process for mission authorization. We therefore propose to develop a complete processing pipeline for the production of synthetic data from a sophisticated

simulation environment of a flight corridor, including weather conditions, ground infrastructure, airspace traffic interactions and even the quality of communication links to operate the drone, all fed by both historical and live data. The system will provide a three-dimensional visualization of the various events that can occur, and an automated risk analysis will enable recommendations to be made to reduce the risks associated with certain operations. The project will train up to 7 master's and doctoral students in direct collaboration with key industry players and in cutting-edge fields such as numerical simulation, aircraft flight dynamics and 3D visualization, operations research and massive data management. Leveraging synthetic data for critical decision-making is at the heart of CAE's mission for a safer world, and the operational support envisaged by the project will contribute significantly to increasing the effectiveness of safety analysis documentation for Unither's specific operations, as well as providing an additional tool for training personnel involved in the planning and execution of flight operations.

**Work environment:**

You'll have access to state-of-the-art equipment and join an outstanding team at Université de Sherbrooke's Institut Interdisciplinaire d'Innovation Technologique (3IT), and be in direct contact with industry-leading professionals at our world-class partners CAE and Unither Bioelectronics.

The duration of the PhD is 3 years with funding.

**Profile required:**

PhD student in electrical or mechanical engineering, interested in intelligent agent simulations. We will be looking for candidates with experience with digital twins or robotics simulation environments.

**How to apply:**

To submit your application, please send an email to [recrutementAIRGIFT@usherbrooke.ca](mailto:recrutementAIRGIFT@usherbrooke.ca) including

- Up-to-date CV
- Transcripts of your university degrees
- Covering letter
- At least 2 relevant letters of recommendation or 3 recent references.

**Discipline(s) by sector**

**Funding offered**

**Partner(s)**

Yes

CAE , Unither Bioélectronique

**Sciences naturelles et génie**

Génie électrique et génie électronique,  
Génie mécanique

The last update was on 12 February 2025. The University reserves the right to modify its projects without notice.