# COLSim

ENSTA Bretagne

FRANCE EXCELLENCE NICOLAS BAUDIN

| | |
|---|---|
| Name of the hosting institution in France | ENSTA Bretagne |
| Name of the host laboratory / research team | Lab-STICC |
| Address | 2 rue François Verny - 29806 Brest Cedex 9 |
| Name of the supervisor | Benoit Clement |
| Function | Professor |
| Email | Benoit.clement@ensta-bretagne.fr |
| Phone number | +33607031484 |

## Internship offer

| | | | | |
|---|---|---|---|---|
| Topic of the internship (title) | COLSim – a light simulator dedicated to collision avoidance | | | |
| Proposed dates of the internship | Start | 01/10/2024 | End | 31/01/2025 |

Scientific and academic objectives of the internship:

Autonomous vessels have emerged as a prominent and accepted solution, particularly in the naval defence sector. However, achieving full autonomy for marine vessels demands the development of robust and reliable control and guidance systems that can handle various encounters with manned and unmanned vessels while operating effectively under diverse weather and sea conditions. A significant challenge in this pursuit is ensuring the autonomous vessels' compliance with the International Regulations for Preventing Collisions at Sea (COLREGs). These regulations present a formidable hurdle for the human-level understanding by an autonomous system as they were originally designed from common navigation practices created since the mid-19th century. Their ambiguous language assumes experienced sailors' interpretation and execution and, therefore, demands a high-level (cognitive) understanding of language and agent intentions that are beyond the capabilities of current state-of-the-art of intelligent system.
The intern will be in charge of developing new parts of an existing Python simulator in order to perform rapid assessment of a COLREGs situation with multiple vessels situation. Some complex tools exist but as the simulator will be dedicated to Learning algorithms we need a very simple but realistic one. The second objective is to compare procedures (AI-based and others) that are COLREGs policy compliant.

## Industrial partner

| | |
|---|---|
| Does the project involve a French industry partner? | No |
| Name | [Insert here] |
| Role of the industrial partner in the internship project | [Insert here] |
| Main contact | [Insert here] |
| Email | [Insert here] |
| Main contact industrial partner's branch in Australia | [Insert here] |
| Email | [Insert here] |

## Australian partner

| | |
|---|---|
| Is the internship project proposed in the framework of an existing collaboration with an Australian partner university? | Yes |
| Name of the Australian partner institution | Flinders University |
| Lab/department/team involved in the collaboration | College of Science and Engineering |
| Main contact in the Australian partner institution | Prof. Karl Sammut |
| Function | Professor |
| Email | karl.sammut@flinders.edu.au |
| Outside of this ongoing collaboration, will students from other Australian universities be considered by the hosting institution in France? | Yes |

## Expected profile of applicant

| | |
|---|---|
| Level of study | Bachelor / Master |
| Discipline | Robotics / Computer Science |
| Prerequisite knowledge, qualities and skills | Python / Robotics / Marine Systems |
| Language of Internship | English / French |
| Other specific eligibility criteria | [Insert citizenship requirements or other preferences here] |