INTERNSHIP PLACEMENT

Project Name: Modelling and simulation of realistic faults in an unmanned underwater vehicle

Host: Naval Group Pacific

Project Scope:

About the organisation:

Naval Group is among the international players in defence naval engineering. For over 400 years, Naval Group has been pushing boundaries to shape the naval technology of the future. With passion, 17,000 employees, including workers, technicians, and engineers, collaborate in France and around the world, pooling their unique expertise to envision, design, build, and maintain exceptional products and systems such as submarines, aircraft carriers, or combat frigates.

Naval Group Pacific (NGP), subsidiary of Naval Group in Australia, represents Naval Group's commitment to the region and further demonstrates the great potential for ongoing industry collaboration, development of capability, and pioneering innovation. Naval Group Pacific develops a world-class research and development (R&D) centre in Australia.

About the project:

The internship will take place in Adelaide, South Australia.

Unmanned Underwater Vehicles (UUVs) have emerged as a prominent and accepted solution, particularly in the naval defence sector. A significant challenge in UUV mission's is ensuring a safe and efficient control despite the occurrence of faults, which refer to an unpermitted condition that changes at least one characteristic property of a component. Faults during a mission are inevitable and can lead to a drop in performance, the termination of the mission or even the loss of the drone. This is why it is necessary to take faults into account when designing the drone's control system. In order to evaluate the control performance realistically, these faults need to be modelled and simulated. The project deals with faults caused by external factors, such as collisions. The focus will be on deformations of the drone's hull, and on partial and total faults of the actuators: propellers blocked or entangled by a foreign object, damage to the propellers, damage to the fins, erosion, etc.

List of Tasks:

The internship will be divided into 4 main tasks:

(1) Familiarising oneself with the internship topic and writing a state-of-the-art review on UUV fault modelling.
(2) Getting started with GAZEBO simulation software and the plugin UUV Simulator.
(3) Modelling realistic faults on UUVs in simulation.
(4) Establishing the limits of fault modelling, and comparison with reality.

Student Details:

Number of students Required:	1
Preferred Study Discipline/s:	Computer Science / Robotics with skills in Python and GAZEBO
Preferred Start Date:	Asap

Naval Group Pacific Details:

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