NEUROMORPHIC AUDIO-VISUAL SCENE ANALYSIS FOR UNDERWATER COLLISION AVOIDANCE

Western Sydney University - University of Sydney

"A proof-of-concept for a neuromorphic underwater audio-visual collision avoidance system for the autonomous or uncrewed underwater vehicles developed by the Royal Australian Navy."

Problem

Minimising the collision risk between a cruising vessel and an uncrewed underwater vehicle and minimising the damage to the vessel or crew injury.

Solution

In collaboration with DSTG, the team developed a neuromorphic sensing system equipped on a Remus and tested it at HMAS Creswell. The system performs neuromorphic sensing locally in real time. It weighs less than 2kg and is equipped with high-performance hydrophones. The system is mounted on Remus and collects low flow-noise underwater data.

The project currently leads real-time underwater surveillance and has attracted the attention and funding from the RAN, and industry partners OCIUS, Qinetiq, and Thales.

DIN funded an extension of the project via Pilot Projects 2.0, which will enable tracking UUVs using a multichannel hydroacoustic system mounted beneath an uncrewed surface vehicle.

START TRL: N/A
EXIT TRL: 4
DIN INVESTMENT: $347,926
EXTERNAL INVESTMENT: $2,234,000
NO OF RESEARCHERS: 4
NO OF NEW ROLES: 0

CONTACT:

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WESTERN SYDNEY UNIVERSITY

THE UNIVERSITY OF SYDNEY

2020

DIN Introductions to various US Military Organisations

2021

DIN Pilot Project
Funding $147,926

ONR Global
Funding $100,00 and $60,000

2022

US Air Force

FA70002020009 Sprite Imaging with High-Speed Neuromorphic Event-Based Cameras $864,000

FA23862314005 Description Evaluation of event-based cameras for CIS-LUNAR position, navigation, and timing $400,000

FA70002320009 FALCON ODIN on-orbit neuromorphic detection $100,000

2023

Warfare Innovation Navy
Funding $660,000

DSTG
Funding $50,000

DIN Pilot Project 2.0
Funding $200,000