



STRONG
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Strengthening Maritime Technology
Research Center

Thematic Workshop on Underwater Distributed Perception

Programme

9 February 2018
Edinburgh, Scotland,
United Kingdom



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UNDERWATER DISTRIBUTED PERCEPTION THEMATIC WORKSHOP

ORGANIZER



www.strongmar.eu

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1. Welcome

Dear all participants,

Welcome to the Thematic Workshop series in the **STRONGMAR**.

The aim of **STRONGMAR** is to create solid and productive links in the global field of marine science and technology between INESC TEC and established leading research institutions in Europe, that are capable of enhancing the scientific and technological capacity of INESC TEC and linked institutions, thereby helping raising research profile of its and its recognition as a European maritime research centre of excellence.

Thematic workshops are designed to provide faster scientific exchange mechanisms, by bringing together small to medium groups of researchers around specific topics. The anticipated outcomes of the workshops are exchange of ideas, research collaborations, and submission of joint research proposals.

This Thematic Workshop (**Underwater Distributed Perception**) will be jointly organised by Ocean Systems Lab, Heriot-Watt University and SeeByte Ltd, a global leader in creating smart software technology for unmanned underwater vehicles and systems. Therefore, the Workshop will bring the world-leading expertise in the field of underwater robotics and sensing from both academia and industry. The talks will cover commercial capabilities, future research requirements, collaborative autonomy and sensor processing of underwater robotics in military, oil and gas and oceanography domains. Four demonstrations from SeeByte will show the cutting-edge underwater vehicles and systems for target tracking and recognition, cooperative autonomy and autonomous inspection.

The **STRONGMAR** team.

2. Venues

The Thematic Workshop will be held on 9th February 2018 in the Edinburgh Conference Centre on Edinburgh Campus of the Heriot-Watt University (morning talk session) and SeeByte Ltd (afternoon demo session).



3. Programme

Day: 9th February 2018

Time: 9:30 – 17:00

- Morning Talk Session (9:30 – 12:00)

Venue: Cedar Room, Edinburgh Conference Centre, Heriot-Watt University

Talk 1 (09:30 – 10:10)

Underwater Robotics, Current Commercial Capabilities and Future Research Requirements

Dr. Scott Reed, SeeByte

Talk 2 (10:10 – 10:50)

Collaborative Autonomy: Multi-robot Examples from Military, Oil and Gas and Oceanography Domains

Dr. Pedro Patron, SeeByte

Coffee Break (10:50-11:10)

Talk 3 (11:10 – 11:50)

Sensor Processing within Underwater Domain: Current Classification Approaches, Emerging Trends and Future Requirements

Dr. Jose Vazquez, SeeByte

- Lunch (12:00 – 13:00)

- Travel from HWU to SeeByte (13:00 – 14:00)

- Afternoon Demo Session (14:00 – 16:30)

Venue: SeeByte Ltd

SeeByte will rotate 4 groups around 4 technology demonstrations. It is around 30 minutes each.

- **SeeTrack Military**

Command and control technology for unmanned systems

- **Neptune**

Multi-vehicle collaborative autonomy

- **Automatic Target Recognition**

Technology for automated image processing and classification

- **AIV**

Autonomous Inspection Vehicle for the offshore industry.

4. Speakers



Dr. Scott Reed leads SeeByte's global engineering group. He is responsible for the delivery of SeeByte's engineering solutions, for monitoring quality assurance and ensuring SeeByte's engineering group fulfils their technical, support and training requirements. Having earned his Master's degree in Astrophysics, Scott attended the Ocean Systems Laboratory at Heriot-Watt University where he completed his PhD specialising in automated detection and classification techniques for side-scan sonar systems. Scott joined SeeByte in 2004 and in 2005 was an invited scientist at the NATO Undersea Research Centre in La Spezia, Italy. Scott became SeeByte's Head of Engineering in 2009.



Dr. Pedro Patron received his Engineering Degree with first-class honors from Universidad de Oviedo (Spain) in 2003. The same year, he was granted with an EU Erasmus fellowship through which he completed a Diplome d'Etudes Approfondies (DEA) in Computer Vision, Image processing and Robotics from the Institut National Polytechnique de Grenoble (France). In 2010, Dr. Patron obtained his PhD in Electrical Engineering from Heriot-Watt University (UK) for his research in adaptive mission planning for unmanned systems. Pedro joined SeeByte in January 2011, to lead the development of SeeByte's Neptune product, which delivers adaptive planning for optimizing the execution of autonomy behaviors during collaborative multi-vehicle operations. Pedro now manages SeeByte's Autonomy portfolio and is responsible for the delivery of SeeByte's research, projects and products in this area.



Dr. Jose Vazquez is an Engineering Manager at SeeByte and is currently responsible for the sensor processing technology program which is comprised by various commercial and research sensor processing projects. He has led the development of SeeByte's new commercial ATR (Automated target recognition) product offering. Jose obtained his M.S in Intelligent Systems (major on mobile robotics) from the ITESM Campus Monterrey, Mexico in 2002. He then earned his PhD in Informatics from the University of Edinburgh, UK in 2006. His doctorate specialised in Multirobot Simultaneous Location and Mapping (SLAM). He then worked at Heriot-Watt University as a Research Associate in a DTC project in Multi-robot SLAM. He also has substantial experience in developing real-time navigation algorithms using Extended Kalman Filters, information filters and particle filters for single and multi-vehicle applications. In November 2007, he became a full time SeeByte employee. He has since been working on developing ATR technologies for various US Navy programs. In addition, he has published sixteen papers related to navigation and ATR technology. His research interests include navigation systems, ATR and fusion algorithms for various sensor types.