Workshop 1 - Underwater Protocol Stack and Standardization of Underwater Networks: In the House of JANUS – The SALSA Protocol Stack

Panel Session – 2 February, Morning

Overview

A panel dedicated to the evolution of underwater communication standards, focusing on the JANUS digital underwater communication protocol and the SALSA protocol stack as a unifying architecture for interoperable multi-vendor underwater networks.

Topics include

- JANUS as the foundational international standard for underwater digital communication
- The SALSA protocol stack: architecture, layers, and design rationale
- Standardization challenges and opportunities for future underwater networks
- Use-cases demonstrating multi-vendor and multi-platform compatibility

Venue

- Department of Information Engineering, University of Padova

Presenters

- Filippo Campagnaro, University of Padova
- Koen Blom, Netherlands Organisation for Applied Scientific Research (TNO)
- Dimitri Sotnik, Fraunhofer FKIE

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Workshop 2 - Multimodal Underwater Networks

Panel Session – 3 February, Morning

Overview

A technical panel dedicated to emerging approaches for multimodal underwater communication networks, integrating acoustic, optical, and RF technologies for challenging marine environments.

Topics include

- Underwater acoustic, optical, and RF communication technologies
- Hybrid communication architectures
- Environmental constraints and channel modeling
- Applications in monitoring, robotics, and data muling

Venue

- Department of Information Engineering, University of Padova

Presenters

- Filippo Donegà, University of Padova
- Filippo Campagnaro, University of Padova and SubSeaPulse SRL
- Riccardo Tumiati, Wireless and More srl

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Workshop 3 - Modulation and coding schemes for underwater networks: a complete overview and evaluation criteria

Panel Session – 4 February, Morning

Overview

A technical panel providing a comprehensive overview of modulation and coding schemes for underwater communication networks, with a focus on performance analysis, practical implementation aspects, and standardized evaluation criteria.

Topics include

- Fundamental modulation and coding schemes for underwater channels
- Performance metrics and evaluation methodologies
- Channel replay, Bellhop ray tracer, and WOSS

Venue

- Department of Information Engineering, University of Padova

Presenters

- Emil Wengle, Swedish Defence Research Agency (FOI)
- Jacopo Lazzarin, University of Padova
- Vincenzo Cimino, University of Padova

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Workshop 4 - Routing protocols for underwater networks: Flooding, Dflood+ and GUWMANET

Panel Session – 5 February, Morning

Overview

A focused panel exploring routing strategies for underwater communication networks, with an emphasis on classical flooding-based approaches, their optimized variants, and protocol families specifically designed for challenging acoustic environments.

Topics include

- Foundations of flooding-based routing in underwater networks
- DFlood: design principles and performance
- GUWMANET: architecture, mechanisms, and practical deployment
- Scalability, robustness, and energy-efficiency considerations

Venue

- Department of Information Engineering, University of Padova

Presenters

- Filippo Campagnaro, University of Padova
- Steven Porretta, NATO STO CMRE
- Dimitri Sotnik, Fraunhofer FKIE, Germany

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Workshop 5 - Robot Operating System Talks Underwater: Architecture and Tested Use-Cases

Panel Session – 6 February, Morning

Overview

A panel dedicated to the adaptation of the Robot Operating System (ROS) to underwater environments, focusing on middleware design, integration with underwater acoustic networks, and validated use-cases involving simulation, emulation, and real-modem communication.

Topics include

- ROS 2 architecture and middleware abstraction for underwater communication
- Integration with DESERT Underwater for multihop networking
- Tested use-cases involving AUVs and ROVs,
- Lessons learned from field experiments and interoperability trials

Venue

- Department of Information Engineering, University of Padova

Presenters

- Davide Cosimo, Centro di Supporto e Sperimentazione Navale – Italian Navy, and University of Pisa
- Davide Costa, University of Padova
- Nicolas Ferraresso, University of Padova

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IEEE OES Oceanic Engineering Society ITALY CHAPTER

Important info

- Each IEEE OES Panel will last approximately 2 hours and will take place in the morning.
- The panels are organized as joint events of the Winter School on Underwater Network Simulations and Experimentation (UNWiS), hosted by the University of Padova, SubSeaPulse SRL, and Wireless and More SRL.
- Further information on UNWiS — including the schedule of the IEEE OES Panels — is available at: https://www.subseapulse.com/unwis/
- **Room capacity is limited** — if you are **not enrolled in UNWiS** but wish to attend the panels, please contact the organizers to verify availability:
  - filippo.campagnaro@unipd.it
  - Email subject: [UNWiS2026_oes_panels]
  - (we are close to room limit, so it's important to contact the organizers to verify if space it's still available)
- For any additional information (room, location, etc), contact:
  - filippo.campagnaro@unipd.it Email subject: [UNWiS2026]

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