



Marine Robotics activities at ISME

*Giovanni Indiveri
ISME Director,
DIBRIS, University of Genova*

*February 17th, 2022 @ CLUSTER BIG
Risorse abiotiche marine: attualità e prospettive*



Università di Genova



*Giovanni Indiveri, Ph. D.
ISME Director*

*Associate Professor in Systems and Control Engineering,
University of Genova, Department of Informatics,
Bioengineering, Robotics, and Systems Engineering -
DIBRIS,
Via all'Opera Pia, 13 16145 Genova, Italy.*



GENOVA
Legal Headquarter



PISA



FIRENZE



ANCONA



CASSINO



LECCE



BOLOGNA



ROMA 1



COSENZA

***NATIONAL INTER-UNIVERSITY CENTER TO SUPPORT RESEARCH ACTIVITIES IN
THE FIELDS OF MARINE TECHNOLOGIES AND OCEANIC ENGINEERING***



Brief Presentation - 1

- Main background

Systems and Control Engineering

Applied Mechanics

Computer Science

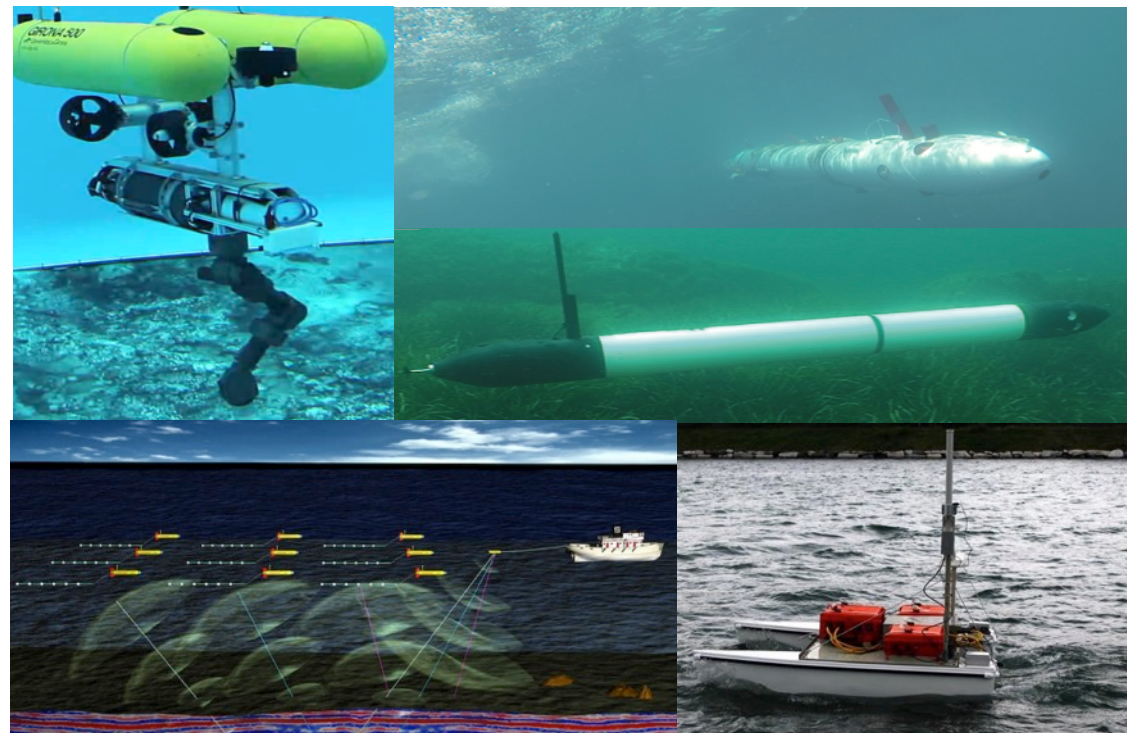
Competences and applications include

- Navigation, Guidance and Control for autonomous marine robots
- Underwater Manipulation and Intervention robotics
- Communication systems
- Marine Acoustics for communication and perception
- Underwater systems mechanical design
- Networking and underwater IoT for underwater environment monitoring and surveillance
- AI and Machine Learning methods
- System identification methods for marine systems
- Proprioceptive and exteroceptive perception
- Mission planning and execution + Human-Machine Interface
- Cooperative Robotics

Brief Presentation - 1

Established in 1999

- 9 Italian University members
- 35- Structured researchers; 15-20 young researchers
- Shared Infrastructures, labs, equipments
- Funding from EU, National , Industrial res. projects
- 1MEuro/year (approximate average of last 5 years)
- CSSN-ISME Joint Lab (SEAI Lab)



A national academic collaborative network of wide-spectrum synergic competences, devoted to research and development on marine unmanned system.



SeaLab: Joint CSSN-ISME Laboratory on “Sistemi Eterogenei Autononomi”



Brief Presentation - 2



SEALab DIRECTOR CSSN - Officer

- promote the Laboratory activities;
- discuss and approve the three year program of work.

Technical Scientific Committee - CTS (at least 5 members of ISME and CSSN)

- Half Yearly monitoring of the Program of Work;
- Three Year Program of Work preparation;
- Annual Report preparation.

Scientific Coordinator ISME Scientist

- direct the Technical Scientific Committee;
- promote the Laboratory;
- prepare the three year program of work;
- prepare the Annual Report.

Brief Presentation - 2

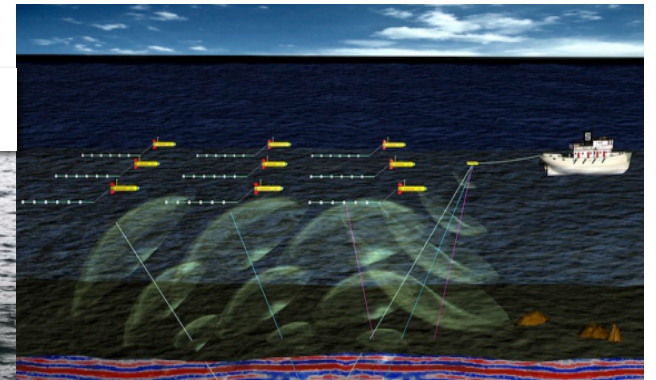
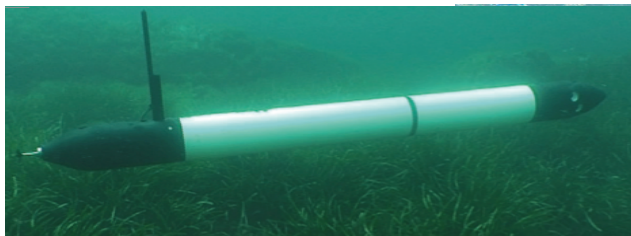
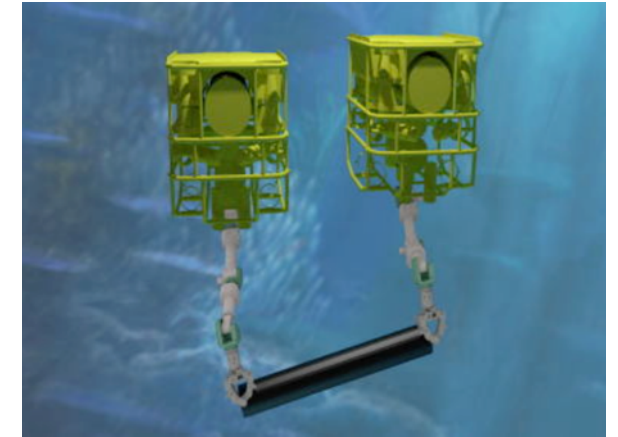
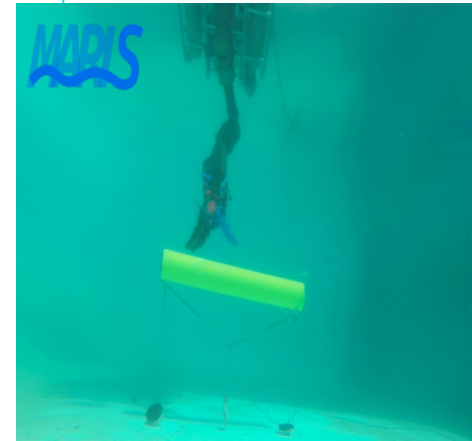


Scientific-Technological Demands	SEALab Project	TEST & EVALUATION
Persistence	PATH (Persistent Auv Through marine energy Harvesting)	
Deployability, Autonomy & Unmanned Systems	ASAP (Auv for Seabed monitoring And intervention with high Projectability)	
Interoperability	UBIqUItous (Underwater Bridging for Improving Unmanned Interoperability)	
Modularity-Reconfigurability, Scalability	MOSAiC (Modularity & Scalability for Autonomous detection and Classification)	
Autonomy & Unmanned Systems	ASSeT (Autonomous Self-reliant Systems Technology)	
Information & Communications Dominance	UNICA (UNderwater Information & Communications Assurance)	
Modeling & Simulation/Mission planning tool/Command& Control/Computer Based Training	CoMPASS (Cross Mission Planning And Simulation Software for AUV)	

Our research activities

An integrated modular approach is adopted, developing throughout the following

- Components, sensors, devices, agent-subsystems
- Sensor Integration & data fusion/interpretation
- Individual Agent Autonomy
- Underwater Communication infrastructures and methods
- Multi-agent Cooperative Autonomy
- Multi-agent Mission Planning and Supervision





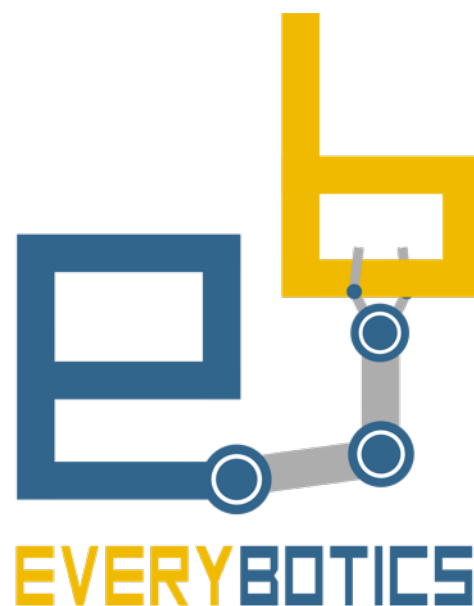
Sines, Portugal,
17 July 2017



WiMUST
Widely scalable Mobile
Underwater Sonar Technology



Spin Offs (and alike)



Director

Giovanni Indiveri - giovanni.indiveri@unige.it

Associated Universities and Departments with point of contacts

Polytechnical University of Marche – David Scaradozzi - d.scaradozzi@staff.univpm.it

University of Cassino and Southern Lazio – Gianluca Antonelli - antonelli@unicas.it

University of Genova – Giovanni Indiveri - giovanni.indiveri@unige.it

University of Salento – Giulio Avanzini - giulio.avanzini@unisalento.it

University of Pisa – Lorenzo Pollini - lorenzo.pollini@unipi.it

University of Florence – Benedetto Allotta - benedetto.allotta@unifi.it

University of Calabria – Alessandro Casavola - a.casavola@dimes.unical.it

University of Roma "La Sapienza" – Chiara Petrioli - petrioli@di.uniroma1.it

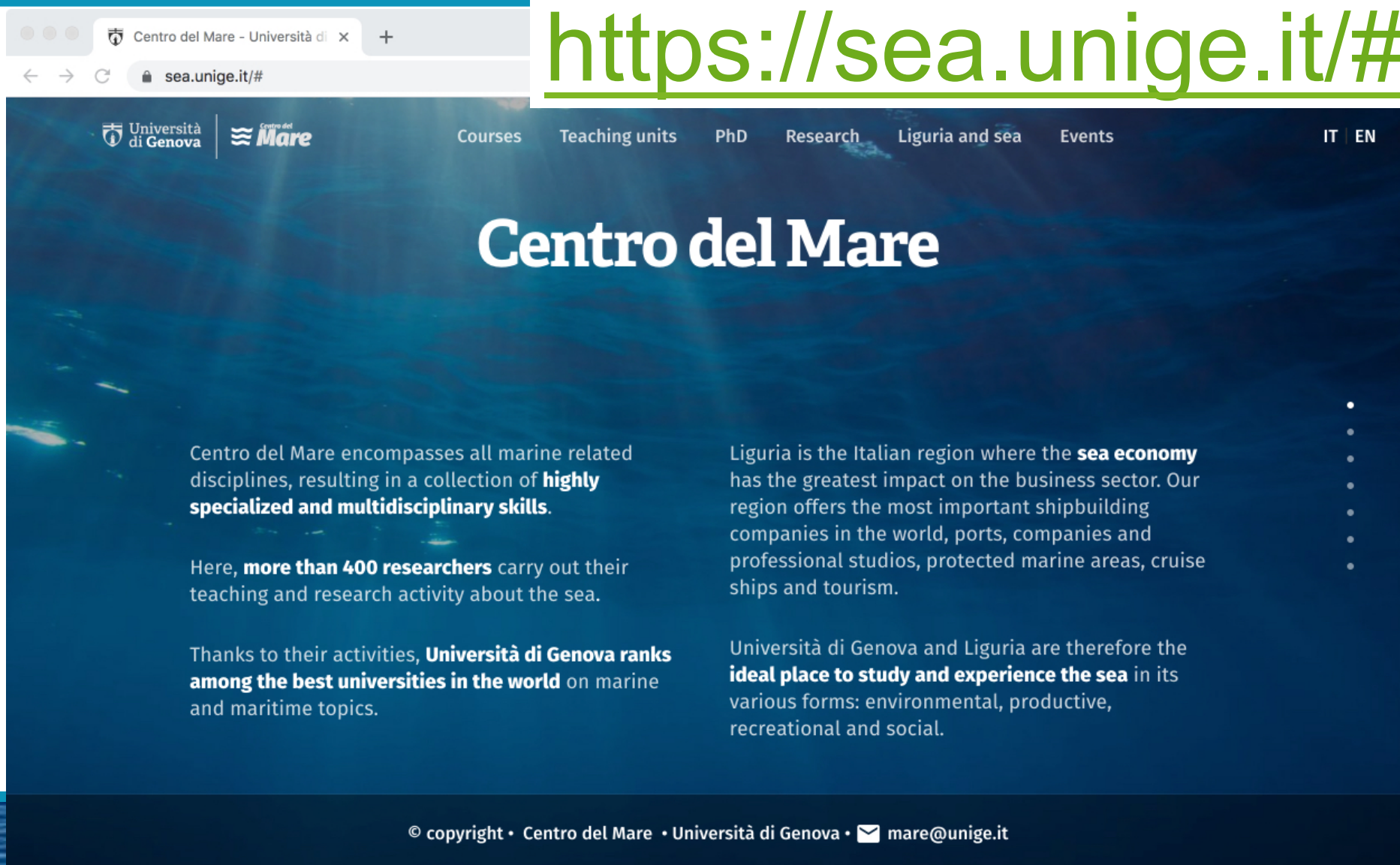
University of Bologna – Claudio Melchiorri - claudio.melchiorri@unibo.it



ISME Youtube channel

Genova as Headquarter

<https://sea.unige.it/#>



The screenshot shows a web browser window with the URL sea.unige.it/#. The website header includes the logos of the Università di Genova and Centro del Mare, along with navigation links for Courses, Teaching units, PhD, Research, Liguria and sea, and Events. The main content area features a large title "Centro del Mare" and three columns of text describing the center's focus on marine disciplines, its research activities, and its role in the sea economy of Liguria. A vertical list of seven dots is visible on the right side of the text columns.

Centro del Mare encompasses all marine related disciplines, resulting in a collection of **highly specialized and multidisciplinary skills**.

Here, **more than 400 researchers** carry out their teaching and research activity about the sea.

Thanks to their activities, **Università di Genova ranks among the best universities in the world** on marine and maritime topics.

Liguria is the Italian region where the **sea economy** has the greatest impact on the business sector. Our region offers the most important shipbuilding companies in the world, ports, companies and professional studios, protected marine areas, cruise ships and tourism.

Università di Genova and Liguria are therefore the **ideal place to study and experience the sea** in its various forms: environmental, productive, recreational and social.

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Applicazioni minerarie subacquee con tecnologie robotiche: l'esperienza del progetto H2020 ROBUST
Robotic subsea exploration technologies

<https://cordis.europa.eu/project/id/690416>

2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
Macau, China, November 4-8, 2019

An underwater photograph showing a school of small fish swimming towards a bright light source in the distance. The seabed is covered with dark, rounded rocks and some green algae. The water is a deep blue color.

Thank you !