

# OES BEACON

Newsletter of the Oceanic Engineering Society



SEPTEMBER 2022, Volume 11, Number 3

[www.ieeeoes.org](http://www.ieeeoes.org)

(USPS 025-095) ISSN 2164-8042

Welcome to OCEANS 2022 Hampton Roads



The OES BEACON is published four times a year as a benefit to the membership of the IEEE Ocean Engineering Society. The OES Beacon is printed and distributed from IEEE headquarters in New York City, New York, USA.

**Editor-in-Chief:**

Harumi Sugimatsu—harumis@iis.u-tokyo.ac.jp

**Co-Editor-in-Chief:**

Robert L. Wernli—wernli@ieee.org

**Associate Editors:**

Masakazu Arima  
Toshihiro Maki  
Takumi Matsuda  
Katsunori Mizuno  
Takeshi Nakatani  
Hisashi Shiba  
Farley Shane  
Blair Thornton

**Contributing Editors:**

Australia—Mal Heron  
China—Lian Lian  
Canada—James S. Collins  
France—Philippe Courmontague  
Germany—Christoph Waldmann  
India—M. A. Atmanand  
England—Blair Thornton  
Korea—Son Cheol Yu  
Scotland—John Watson  
Singapore—Venu Pallayil  
Taiwan—Jenhwa Guo  
USA—Stan Chamberlain

**Publication Copy-Due schedule:**

4th Qtr: December 2022: November 14

1st Qtr: March 2023: February 14

Members are encouraged to submit copy highlighting 1) Chapter Events, 2) People & Company News, 3) Student & Young Professional News, 4) Technology Updates, or 5) other material of broad interest to the OES. Please send to Beacon Editor-in-Chief, Harumi Sugimatsu <harumis@iis.u-tokyo.ac.jp>. Word format, 1-1/2 space; Photos (always encouraged): jpg, 300 dpi preferred. Material becomes property of IEEE-OES. Please send e-mail or physical address corrections or updates to the EIC.

---

**IEEE OCEANIC ENGINEERING SOCIETY EXECUTIVE COMMITTEE**

**President**

CHRISTOPHER WHITT

**Vice President**

Workshops & Symposia  
FAUSTO FERREIRA

**Treasurer**

ELIZABETH L. CREED

**Vice President**

Technical Activities  
VENUGOPALAN (VENU) PALLAYIL

**Vice President**

OCEANS  
JOHN WATSON

**Journal Editor-in Chief**

MANDAR CHITRE

**Vice President**

Professional Activities  
BRANDY ARMSTRONG

**Secretary**

MARINNA MARTINI

**Junior Past President**

Vacant

**Senior Past President**

JERRY C. CARROLL

---

**ELECTED ADMINISTRATIVE COMMITTEE**

**2020–2022**

JOÃO ALVES  
JAMES V. CANDY  
TIMOTHY DUDA  
KEN FOOTE  
SHYAM MADHUSUDHANA  
JOHN R. POTTER

**2021–2023**

GERARDO ACOSTA  
FARHEEN FAUZIYA  
MALCOLM HERON  
KATSUYOSHI KAWAGUCHI  
ROSMIYATI MOHD MOKHTAR  
ROBERTO PETROCCIA

**2022–2024**

M. A. ATMANAND  
JAMES S. COLLINS  
STEPHEN M. HOLT  
LIAN LIAN  
HARUMI SUGIMATSU  
ROBERT L. WERNLI

---

IEEE OES Beacon Newsletter (ISSN 2164-8042) is published quarterly by the Oceanic Engineering Society of the Institute of Electrical and Electronics Engineers, Inc. Headquarters: 3 Park Avenue, 17th Floor, NY 10017-2394. \$1.00 per member per year (included in Society fee) for each member of the Oceanic Engineering Society. Printed in U.S.A. Periodicals postage paid at New York, NY and at additional mailing offices. Postmaster: Send address changes to IEEE OES Beacon Newsletter, IEEE, 445 Hoes Lane, Piscataway, NJ 08854

©2022 IEEE

Permission to copy without fee all or part of any material without a copyright notice is granted provided that the copies are not made or distributed for direct commercial advantage, and the title of the publication and its date appear on each copy. To copy material with a copyright notice requires specific permission. Please direct all inquiries or requests to IEEE Copyrights and Permissions Office.

IEEE prohibits discrimination, harassment, and bullying.  
For more information, visit <http://www.ieee.org/web/aboutus/whatis/policies/p9-26.html>.



## Table of Contents

<i>Welcome to OCEANS 2022 Hampton Roads</i> . . . . .	Cover
<i>Member Benefits—Did You Know?</i> . . . . .	3
<i>From the OES BEACON Editors</i> . . . . .	4
<i>From the President</i> . . . . .	5
<i>VPTA Column</i> . . . . .	5
<i>VPPA Report</i> . . . . .	7
<i>VPWS Report</i> . . . . .	8
<i>VP OCEANS Report</i> . . . . .	9
<i>From the EIC's Desk</i> . . . . .	10
<i>Passing of Claude Brancart</i> . . . . .	11
<i>Are You Our Next Laureate?</i> . . . . .	12
<i>Chapter News</i> . . . . .	13
<i>A Fresh Look at Systems Engineering Methods for Ocean Observations</i> . . . . .	15
<i>IEEE OES Ocean Decade Initiative</i> . . . . .	16
<i>OES Conference Calendar</i> . . . . .	21
<i>RAMI 2022 Report</i> . . . . .	22
<i>Ad on OTC Brazil</i> . . . . .	24
<i>Ad on AUV2022</i> . . . . .	25
<i>Ad on SAUVC 2022</i> . . . . .	26
<i>Ad on BTS 2022</i> . . . . .	27
<i>Ad on UT23</i> . . . . .	28
<i>Blast From the Past</i> . . . . .	29
<i>OCEANS 2022 Hampton Roads is on the Horizon</i> . . . . .	30
<i>OES Events and Sessions OCEANS22 Hampton Roads</i> . . . . .	31
<i>Ad on OCEANS 2023 Limerick</i> . . . . .	32
<i>Ad on OCEANS 2023 Gulf Coast</i> . . . . .	34
<i>Who's Who in the IEEE OES</i> . . . . .	35
<i>Member Highlights</i> . . . . .	37
<i>AdCom Election Results</i> . . . . .	38
<i>Welcome New and Reinstated Members</i> . . . . .	38
<i>UNIZG SBC Half-Year Activities Report March–July 2022</i> . . . . .	39
<i>Attention OES Students</i> . . . . .	50
<i>OCEANS 2023 Limerick</i> . . . . .	Cover

## Member Benefits—Did You Know?

IEEE members can take advantage of exclusive and discounted pricing on insurance and a variety of products and services (where available) that can add up to substantial savings. Discover what IEEE Member Discounts can offer you. (This program is offered exclusively to active IEEE members.)

Go to: <https://www.ieee.org/content/ieee-org/en/membership/discounts/>



---

## From the OES BEACON Editors

**Harumi Sugimatsu and Robert Wernli**

Welcome to the September 2022 issue of the Beacon. As we mentioned in the last issue, the international participation in OES is certainly on the increase. This is apparent in the reports on the activities of the University of Zagreb Student Branch Chapter and the very active Malaysia Chapter. In addition, we have a great report from the NATO-STO Center for maritime Research and Experimentation (CMRE) on the OES sponsored RAMI 2022 robotics competition.

Although most of our committee meetings have been virtual, our ExCom and AdCom have been quite busy ensuring the efficient operation of our society in these trying times. Our issue begins with a report from our President, which is followed by reports from our VPs for Technical Activities (VPTA), OCEANS (VPO), Professional Activities (VPPA) and Workshops and Symposia (VPWS). The Journal EIC also provides a list of recently released papers that are available to our members.

As shown in our VP reports, there has been no slow down in planning our workshops, symposia, competitions and OCEANS conferences. And most of them are now returning to in-person events. Not only do they provide networking opportunities, but they help introduce our members to opportunities for professional advancement, such as participation in our technical committees as discussed in the VPTA report. A good example of committee activities can be found in this issue's report by the Standing Committee on Standards.

Our OCEANS conferences are nicely coming together. The "springboard" approach from OCEANS 2021 San Diego to OCEANS 2022 Hampton Roads, and then to OCEANS 2023 Gulf Coast is working well. The latest from OCEANS 2022 Hampton Roads and OCEANS 2023 Limerick is reported in this issue.

Have you done something exciting lately? Received an award or professional recognition? Be sure to contact your editors about submitting an article. You'll see good examples from two of our very active members in this issue's Who's Who in the IEEE OES and Member Highlights.

There is a wealth of other information and articles in this issue that we hope you enjoy. And, as always, we'll close by inviting you to participate in your society. Submit articles and material for the Beacon. Or... volunteer for other society activities as a participant or an elected officer. It's your society and it is here to help you reach your professional goals. Enjoy.



*Been a long time since my last in-person AdCom at OCEANS 2019 Seattle. Can't wait for our next get together.*



*Been a long time since 2019 when the AdCom had in-person meetings like the one I attended in Marseille. Can't wait to grip-and-grin with everyone again at OCEANS 2022 Hampton Roads.*



---

## From the President

**Christopher Whitt, OES President**

The countdown is on to the next OCEANS 2022 in Hampton Roads, VA, USA! We are really excited to see you there. If you can't attend in person, be sure to take advantage of the virtual program. Around the society, many things are happening. There are several workshops and symposia this fall and early next year. We look forward to hearing about the Singapore AUV Competition results soon. While things are not the same as before the pandemic, there are always many ways for us to connect as ocean professionals. Look for events in your local chapter, and virtual events around the world.

Over the past two years the UN Decade of Ocean Science for Sustainable Development has started in earnest. OES was represented this past June at the UN Ocean Conference in Lisbon by me, the VP Technical Activities and the Earthzine editor. We have been developing our own initiative for how OES will participate in the Ocean Decade; you can expect to hear more about this very soon! Information will be available at [ieeoes.org/oceandecade](http://ieeoes.org/oceandecade) as it becomes available.

Many of our Ocean Decade activities have involved raising awareness about the massive needs and opportunities for research and innovation to support the science needed for the Ocean Decade. However, we expect that very soon we will start



to highlight the many ways in which our members are increasingly providing that needed technology contribution to better understanding and management of the ocean. If your research or business involves innovation that does—or could—support ocean science and the Ocean Decade we want to hear about it!

Over the coming months we will have several Society events to look forward to. At OCEANS Hampton Roads we will announce our 2022 Award winners—look for information in the next Beacon issue. Also, at the October AdCom meeting we will elect our 2023 ExCom, which will set the leadership direction of the society for next year. Finally, the Providence Chapter has been diligently working for several years to get an IEEE Milestone recognition for the technology contribution of DSV Alvin. The unveiling of this milestone will occur Friday 21 October, 2022, at Woods Hole Oceanographic Institution, with OES executives and the IEEE President in attendance.

I'm proud to serve the Society and work with so many excellent volunteer friends and colleagues. There is always more to be done to serve our community and members, so if you want to contribute to the community, strengthen your professional network, and be involved in making OES happen, please email me or any Executive member at any time!

---

## VPTA Column

**Venugopalan Pallayil, Vice President for Technical Activities, IEEE OES**



OES Colleagues,  
Greetings!

I am happy to note that more and more conferences are now being organized in hybrid format (from its previous virtual counterpart) and this mode of operation may stay for some time. Many conferences in the Asia Pacific region had been dominated by participants from China and the ongoing travel restrictions have impacted the in-

person attendance significantly. In July 2022 I had the opportunity to organize an international conference which saw almost all of the researchers from China presenting their papers virtually. Nevertheless, we had over 160 participants from other parts of the world attending in-person and it is a matter of satisfaction that the participants see a value in meeting face to face

and networking despite the risks, though minimal, associated with the Covid-19 infection. Some details of the said conference have been covered in a separate article in this Newsletter under 'Member Highlights' for your reading pleasure.

We are in the third quarter of the year, and it is great to know that some of our technical activities, which have either been at a standstill or delayed due to lack of funding support, could get a renewed start. There will be limited funding available to the chapters, TCs and DLs in support of their technical activities. The details are covered in the relevant sections below. Unfortunately, the late availability of 2022 funds, which must be spent this year, has resulted in insufficient time to receive, and evaluate proposals. This should not be an issue in 2023.

### Technology Committees (TC)

It is time to find new leadership for many of our TCs. The extended term of current TC Chairs ends on 31 Dec 2022. We would like to invite interest from the OES community for the

new 3-years term of TC Chairs starting from 01 Jan 2023. You will soon see a call for new TC Chairs by the TC Coordinator, and we hope to see great recommendations from our OES communities, especially from past TC Chairs. We also believe some restructuring of the TCs are inevitable; some inactive TCs will have to be disbanded and proposals for new TCs can be considered if they are relevant and not overlapping largely with the scope of current TCs.

As envisaged in our Policy and Procedures (PnP), TCs are the driving force for technology areas for OES and they have a duty to foster the development of their technology field of interest, to encourage applications in science and engineering and to ensure that benefits are delivered for the benefit of mankind. They have an active role in the Distinguished Lecture Program, in organizing and running technical session tracks at OES-(co)sponsored conferences and establishing single-stream Workshops and Symposia in conjunction with Chapters and other Organisational Units or OUs. So, make sure the nominees for the TC Chair positions will be able to discharge their duties well and as envisaged in the relevant PnP.

Limited funding is now available under the Technology Activity Funding (TCAF) scheme for promoting TC activity such as symposia and workshops. This year a funding support to the tune of 3.5K has been awarded to the Autonomous Maritime Systems (AMS) TC for the participation of a TC nominee in the IEEE/OES AUV 2022 Singapore Symposium.

## Chapter Activities

As a follow up to my last Beacon report, we have sent out a call for participation of the chapters in the UN Decade of Ocean activities through the IEEE OES Ocean Decade initiative. Chapters will be awarded up to \$2000 depending on the type of the activity proposed and its relevance to Ocean Decade. The deadline for the proposals is 31 Aug 2022, which would probably have passed by the time this issue of the Beacon Newsletter gets out. Nevertheless, I would like to encourage the Chapters to prepare their proposals for consideration for funding in the year 2023. A similar call for the year 2023 is expected to be out later this year. This would be a great opportunity for OES volunteers to contribute to a global cause and also get noticed among the international communities.

The chapter activity funding scheme (CHAF) for this year has some funds for disbursement. The funding is usually provided to chapters who plan to run short workshops and symposia under its umbrella. Due to uncertainties associated with the

fund availability, the chapters were unable to plan for such events and hence make use of the funds that are now available for use.

## Distinguished Lecturers (DL)

The call for new DL appointments ended on 31 July 2022. Unfortunately, only two proposals were received. One proposal came through a TC, while the other was received upon request from VPTA. The proposals will be evaluated by the DL Committee and, if found suitable, will be submitted for AdCom approval.

Funds to the tune of \$2K are available for DL support. Chapters or organisers of DL could tap into this to provide limited short haul support or one night's stay if such situations are warranted. Such funding support will have a cap of \$500 per DL. Prior approval from VPTA should be sought before to ensure fund availability for the proposed DL activity.

## UN Ocean Decade (2021–30) Conference

The second UN Ocean Decade Conference was held at Lisbon, Portugal, from June 27<sup>th</sup> to July 1<sup>st</sup> of 2022. Three OES members participated as IEEE (OES) representatives. These were the President, VPTA and Earthzine magazine Editor, who are also IEEE OES Ocean Decade Initiative Committee members. Participation in the conference helped to network with various stake holders and like-minded people and has resulted in opportunities for collaborations between OES and other scientific and industrial partners. A report on the related activities will be carried separately.

I am also happy to state that two of the IEEE OES activities, the IEEE/OES AUV 2022 Symposium, and the Singapore AUV Challenge, have been endorsed by the UN Ocean Decade Committee and are now listed on their website. This is significant because it increases the visibility of IEEE OES among the Ocean Decade community and in some ways an acknowledgement of our potential to contribute to the Ocean Decade program.

## Feedback

What are your thoughts about IEEE OES Technical Activities? I welcome constructive suggestions and comments on VPTA activities. It would help to look at things from different perspectives and bring new ideas, and thus make our technical activities more appealing and useful. Email me at [vp-technical-activities@ieeeco.org](mailto:vp-technical-activities@ieeeco.org).

# Preparing to Meet our Members with Opportunities

**Brandy Armstrong, VP Professional Activities**



It's been a busy year and I am ready to meet some more IEEE Oceanic Engineering Society (OES) members at OCEANS 2022 Hampton Roads. This year we have been focusing on strategic planning and member benefits. We have lots of great opportunities coming up for our members and volunteers.

## OCEANS Members Reception

In appreciation of our members, we will be holding a member's reception at OCEANS 2022 Hampton Roads. This is a great opportunity for our members to meet with Society leaders and learn how to get more out of membership and volunteering.

## Senior Membership Drive

Our Membership Development Chair, Rajat Mishra, is planning a Senior Membership Drive at OCEANS. Senior member is the highest grade for which IEEE members can apply. Those eligible for Senior Membership should bring their resume and work with our senior member volunteers to apply at the OCEANS Society booth. We'll help with the process; all you need to bring is your experience.

## YP BOOST and WIE PROPEL

The application process will begin again this fall to select two new YP BOOST and WIE PROPEL laureates. Please keep an eye out for the call and encourage young professionals and supporters of women to apply. We will publicize the opportunity and the call at the YP and WIE Breakfast panels at OCEANS 2022 Hampton Roads.

## Wondering What Our Laureates are Up to?

Our current YP BOOST laureates are involved in:

- Strategic planning
- Organizing WIE and YP breakfast panels at OCEANS
- Planet Positive 2030 (and initiative of the IEEE Standards Association)
- Ocean Decade ECOPS initiative
- Organizing Berths of Opportunity with Schmidt Ocean Institute
- Beacon and Earthzine contributions
- Promoting OES on social media

Our current WIE laureates are:

- Dr. Giulia De Masi is organizing a WIE panel at ROSE2022 (<https://rose2022.ieee-ims.org/>): "Women in Robotics and Engineering: challenges and possible paths during the early career and beyond."
- Dr. Lu Ma held a symposium on "How to Promote Women to Play a Greater Role in the Field of Engineering Science and Technology."

## See More of OES, Online

Did you know that many of our special panels and programs have an online presence? You can find YP and WIE Panels, distinguished lectures, awards, testimonials and more at our IEEE OES YouTube Channel.

*Do you know who are next YP BOOST or WIE PROPEL Laureate might be? Be sure to share the call for applicants this fall!*



# From the Vice President for Workshops & Symposia

**Fausto Ferreira, Vice President for W&S**



We are now in the busiest trimester of OES Workshops & Symposia as you can see in this article. In parallel, the Policies and Procedures for VPWS have been approved by the OES Administrative Committee (AdCom) and by the time this newsletter is out, I hope AdCom will already have approved the nominations for the Workshops & Symposia (W&S) Committee. Moreover, with OCEANS 2022 Hampton Roads

coming up and most people returning to travel again, we are planning a meeting of the W&S Committee at OCEANS as well as a meeting with all OES conference organizers attending OCEANS. The latter one has the goal of improving the coordination of the different W&S, share experiences and best practices and hear suggestions for improvements from the organizers. Finally, I would like to encourage every member and colleague to attend the event that fits best their research/interest as there are plenty of options in several places, times, and formats!

## Robotics for Asset Maintenance and Inspection (RAMI) Marine Robots 2022 Competition

The first RAMI Marine Robots competition was held at the NATO STO Centre for Maritime Research and Experimentation (CMRE) in La Spezia, Italy, from 10 to 15 July 2022. It was a successful competition after 2 years of COVID-related interruption. Please find a full report elsewhere in this newsletter. In addition, check the related virtual competition on object recognition in <https://metricsproject.eu/inspection-maintenance/rami-cascade-campaign-marine/>

## Underwater Communications and Networking (UCOMMS) 2022

By the time you will be reading this, the 2022 Sixth Underwater Communications and Networking (UCOMMS) will already taken place in Lerici, Italy, from 30 August to 1 September. Over 30 papers are expected to be presented and over 80 people were registered at the time of writing. Three high-quality keynote talks on timely and interesting topics complement the technical program. The 10th anniversary of this high-quality single-track conference is marked by a commemorative plaque acknowledging the LOC efforts. The next Beacon edition will include a full report on UCOMMS. <https://ucomms.net/>

## 2022 IEEE OES Autonomous Underwater Vehicles (AUV) Symposium

The IEEE OES Autonomous Underwater Vehicles (AUV) 2022 is taking place in a hybrid format, both in Singapore and online

from the 19th to the 21st of September, 2022. Over 40 papers are expected to be presented and over 70 attendees are registered at the time of writing. Three excellent plenary talks complement the technical program. <http://auv2022.org/>

This symposium will be followed by the Singapore AUV Challenge from the 23rd to the 26th of September <https://sauvc.org/>

## Breaking the Surface (BTS) 2022

For the 14th year in a row, the International Interdisciplinary Field Workshop of Maritime Robotics and Applications—Breaking the Surface (BTS) 2022—will take place in Croatia. This edition is co-organized by the OES University of Zagreb Student Branch Chapter and is being held from the 25th to the 30th of September in Biograd na Moru, Croatia. For all updates and photos during the event, follow the Facebook page <https://www.facebook.com/BtSCroatia> and the official website <https://bts.fer.hr>.

## 2022 IEEE International Workshop on Metrology for the Sea (MetroSea 2022)

The 2022 IEEE International Workshop on Metrology for the Sea (MetroSea 2022) will take place from the 3rd to the 5th of October in Milazzo, Italy. This is a conference co-organized by our OES Italy Chapter together with other IEEE societies. For more information check out the official website on <https://www.metrosea.org/>

## IEEE 9th International Conference on Underwater System Technology: Theory and Applications (USYS 2022)

USYS 2022 will take place from the 5th to 6th of December in Kuala Lumpur, Malaysia, and online. USYS 2022 is being organized by our OES Malaysia Chapter. The call for papers is now closed but if you are interested in attending you can register at an early-bird rate until the 19th of November. More details can be found on <https://oes.ieeemy.org/about-us/ieee-usys-2022/>

## 2023 IEEE Underwater Technology (UT)

The International Symposium on Underwater Technology (UT23) will take place from the 6th to the 9th of March, 2023, in Tokyo, Japan. The call for papers is open until 16 September so make sure you submit your abstract on time! A nice feature of this edition's preliminary program is the Workshop on Career Path Benefits of AUV/ROV Competitions on the 6th of March. For more information check <http://www.ut23.org/>

## Future Plans for 2023

As mentioned before, there are several confirmed workshops for 2023. Besides UT 2023, OES is supporting Breaking the



Surface 2023, to take place in Montenegro, and MetroSea 2023, to take place in Malta, making sure we widen our geographic reach and attract new people to our society. More news on these events will come at a later stage.

Finally, I would like to remind any OES members that wish to get involved in current workshops, or propose new ones, to

contact me at [vp-workshops-symposia@ieeeoes.org](mailto:vp-workshops-symposia@ieeeoes.org) and check the updated guidelines on <https://ieeeoes.org/conferences/workshops-and-symposia/>. We are here to serve the OES members and the larger community, and if you have ideas on improving current workshops, you are more than welcome to forward them to me!

---

## OCEANS 2022 Hampton Roads and After

**John Watson, OES Vice-President for OCEANS**



The OCEANS 2022 Hampton Roads (Virginia Beach Conference Center, 17–20 October 2022) conference is now almost upon us. You may even be there by the time you read this. The Local Organizing Committee have pulled out all the stops to make this event a dynamic OCEANS. All the expected OCEANS content is there: the student poster competition, regular

technical sessions, an up to the minute exhibition of industrial, commercial and academic companies and institutions. OCEANS kicks-off with its traditional plenary and keynote sessions featuring talks from senior academics, industrialists, those from government institutions and the US NAVY. The latest news from Hampton Roads is that both NASA and the US NAVY are helping to co-Chair specific sessions and meetings in the conference (more on this on the web-site). As is becoming the norm, this OCEANS will be hybrid in nature with a fine mix of on-line and live content. It is hoped that the recent world-wide relaxations in COVID-19 restrictions will allow a much higher number of registrants and attendance of in-person delegates. This will be a welcome return to some degree of normality! The call for papers has now closed so I hope you have managed to meet the deadline and have had your contributions accepted.

See the OCEANS web-site for the latest program/events and registration details. See <https://hamptonroads22.oceansconference.org>.

As we move into 2023, we have Limerick on the west coast of Ireland to look forward to in June 2023. The Limerick LOC (co-Chairs Daniel Toal and Edin Omerdic) are well ahead in their preparations for a very exciting conference. I am sure we can all look forward to some traditional Irish hospitality. Following that we will return to the Gulf Coast for the next North American OCEANS in 2023. The Gulf Coast is always a memorable event and many of you will have experienced several trips to Biloxi for previous OCEANS' on the Gulf Coast.

As I mentioned in my last OCEANS review, I can confirm that the European 2025 OCEANS will be held in Brest, France and the 2025 North American OCEANS will be on the Great Lakes, in Chicago. The last time OCEANS was in Brest was in 2005 and was one of the first I attended as General Chair for the 2007 OCEANS in Aberdeen. OCEANS has never been to Chicago before and with the conference setting on the edge of the Great Lakes promises to be an exciting venue.

The General Chairs for Brest and Great Lakes are Prof René Garelo, who is well known to many of you, and Hans Van Sumeren, respectively. We wish them both well in their preparations.

See you in Hampton Roads.

# From the Journal Editor's Desk: IEEE Journal of Engineering Early Access Papers

**Mandar Chitre, Journal Editor-in Chief**

Congratulations to the authors of our most recently approved papers for the IEEE JOE. The following papers were published as Early Access papers online on IEEE Xplore and will appear in regular issues soon. You'll find these papers now:

- "Reinforcement Learning Based Underwater Wireless Optical Communication Alignment for Multiple Autonomous Underwater Vehicles", Y. Weng; J. Pajarinen; R. Akrou; T. Matsuda; J. Peters; T. Maki.
- "Evaluation of UKF-Based Fusion Strategies for Autonomous Underwater Vehicles Multisensor Navigation", A. Bucci; M. Franchi; A. Ridolfi; N. Secciani; B. Allota.
- "Multilabel Classification of Heterogeneous Underwater Soundscapes with Bayesian Deep Learning", B. Beckler; A. Pfau; M. Orescanin; S. Atchley; N. Villemez; J.E. Joseph; C. W. Miller; T. Margolina.
- "Validation of Targets in Sonar Imagery Using Multispectral Analysis", G. Gubnitsky; A. Giladi; R. Diamant.
- "The Effect of Directional Ambient Noise on an Underwater Acoustic Link in Shallow Environments", A.L. Egbewande; J.-F. Bousquet; D.R. Barclay.
- "Active Underwater Target Detection Using a Shallow Neural Network with Spectrogram-Based Temporal Variation Features", Y. Choo; K. Lee; W. Hong; S.-H. Byun; H. Yang.
- "An Efficient Near-Field Model Gain-Phase Self-Calibration Method for Uniform Rectangular Arrays", F. Wang; R. Jiang; X. Tian; X. Liu; S. Jiang; B. Gu; Y. Chen.
- "Multipath Data Fusion with Recursive ML-PDA and Generative ML-PMHT for VLO Targets in Underwater Environment", C. Franzini; F.A.N. Palmieri; P. Willett; Y. Bar-Shalom.
- "Experimental Marine Vibrator with a Helmholtz Bubble Resonator in the Frequency Range 5-16 Hz", A.K. Morozov; D.C. Webb.



- "A Transformer-Based Regression Scheme for Forecasting Significant Wave Heights in Oceans", P. Pokhel; E. Ioup; J. Simeonov; M. T. Hoque; M. Abdelguerfi.
- "Virtual Maps for Autonomous Exploration of Cluttered Underwater Environments", J. Wang; F. Chen; Y. Huang; J. McConnell; T. Shan; B. Englot.
- "An Embedded Tactical Decision Aid Framework for Environmentally Adaptive Autonomous Underwater Vehicle Communication and Navigation", E. C. Bhatt; B. Howard; H. Schmidt.
- "Joint CFO, Gridless Channel Estimation and Data Detection for Underwater Acoustic OFDM Systems", L. Wan; J. Zhu; E. Cheng; Z. Xu.
- "Compounding Approaches for Wind Prediction from Underwater Noise by Supervised Learning", A. Trucco; A. Barla; R. Bozzano; E. Fava; S. Pensieri; A. Verri; D. Solarna.
- "Safe Maneuvering Near Offshore Installations: A New Algorithmic Tool", I. Maslov; E.B. Ambrosovskaya; A.M. Dvorkin; A.V. Proskurnikov; A. Mordvintsev.
- "Target Detection and Segmentation in Circular-Scan Synthetic-Aperture-Sonar Images Using Semisupervised Convolutional Encoder-Decoders", I.J. Sledge; M.S. Emigh; J.L. King; D.L. Woods; J.T. Cobb; J.C. Príncipe.
- "Texture-Based Seafloor Characterization Using Gaussian Process Classification", B. Gips.
- "Detecting Marine Organisms Via Joint Attention-Relation Learning for Marine Video Surveillance", Z. Shi; C. Guan; Q. Li; J. Liang; L. Cao; H. Zheng; Z. Gu; B. Zheng.
- "A Soft Robotic Gripper With Neutrally Buoyant Jamming Pads for Gentle Yet Secure Grasping of Underwater Objects", C. E. Capalbo; D. Tomiano; F. Bruno; D. Rizzo; B. Phillips; S. Licht.

# Passing of Claude Brancart

*Robert Wernli and Harumi Sugimatsu, BEACON Editors*

Unfortunately, it has come to our attention that one of our most active members, Claude Brancart, passed away last December. Claude was a former AdCom member, our representative on the OTC Board, OES Secretary, Chairman of OCEANS '96 MTS/IEEE and was OES President in 1997–1998. We will provide an article in the December Beacon that addresses his career and the significant impact he had on the OES. If you would like to add a personal comment, **please send to your Beacon editors before the 14 November deadline.**





OFFSHORE  
TECHNOLOGY  
CONFERENCE  
2023  
#OTC2023

1-4 MAY 2023 • WACO PARK • WASHINGTON, TEXAS, USA

CALL FOR PAPERS

ABOUT ATTEND AWARDS EXHIBITORS BRANDING AND ADVERTISING TECHNICAL PROGRAM

OFFSHORE TECHNOLOGY CONFERENCE

2023 Call for Papers

SUBMIT AN ABSTRACT FOR OTC 2023

CALL FOR PAPERS IS OPEN

2023

Become an industry thought leader and submit your paper proposal to help accelerate offshore R&D efforts, support global business opportunities, and address the challenges faced by the offshore energy sector. OTC 2023 will explore the trends, challenges, and advancements affecting the offshore sector on a global scale.

Proposals will be accepted through **13 September 2022**.

SUBMIT YOUR ABSTRACT

OTC looks forward to receiving high-quality submissions that will help shape a vibrant future for the offshore industry and contribute to our world-class technical program.

NEED INSPIRATION? [Access the OTC 2022 Papers](#)





# IEEE Oceanic Engineering Society



2021 - 2022



2022 - 2023



2023 - 2024

ARE YOU OUR NEXT  
**Laureate?**

Apply for YP BOOST and WIE PROPEL Fall of 2022

[HTTPS://IEEEOES.ORG](https://IEEEOES.ORG)



## Chapter News

### Submit Chapter News to Beacon Co-Editors and OES Chapter Coordinator

#### Malaysia Chapter

##### 3rd Multi-Object Collision Avoidance for a Riverine Autonomous Surface Vehicle

*Reported by Zainah Md. Zain & Mohd Shahrieel Mohd Aras*

The 3rd technical talk, organized by IEEE OES, was presented by Assoc. Prof. Ir. Dr. Rosmiwati Mohd Mukhtar, who is a Deputy Dean (Academic, Career & International), School of Electrical and Electronics Engineering, University of Science Malaysia. She is the former secretary of IEEE OES Malaysia Chapter. This talk was held on 19 May 2022, virtually in FB live at IEEE Oceanic Engineering Society—Malaysia Chapter. During the talk, she explained multi object collision avoidance for a riverine autonomous surface vehicle.



3rd 2022 IEEE OES Technical Talk Poster.



Photo during technical talk session.

##### USYS'22: Kick off Meeting with Northwestern Polytechnical University China

*Reported by Zainah Md. Zain & Mohd Shahrieel Mohd Aras*

The 9th IEEE International Conference on Underwater System Technology: Theory and Applications (USYS'22) is a hybrid conference that will be held in collaboration with International Islamic University of Malaysia (IIUM) and Northwestern Polytechnical University, China (NWPU) on the 5 to 6 December

2022. This conference aims to provide a platform for researchers, scientists, engineers, academicians, and industrial professionals from around the world to share, discuss, and disseminate their current research and development activities and experiences in the field of underwater system technology, including relevant theories and applications. The 9th IEEE USYS 2022 focuses on developing new engineering strategies for the preservation of the oceans' eco-system, as well as providing a specialized forum for discussing the future of underwater system technology. The 1st online meeting with all collaboration members including from NWPU has been held on 24 May 2022 via VooV. In this meeting, the USYS'22 planning and work flow has been discussed.



Photo during the meeting.

##### Research and Innovation Engineering Day 2022 (RADIATE'22)

*Reported by Mohd Shahrieel Mohd Aras & Zainah Md. Zain*

The RADIATE 2022 Committee, Faculty of Electrical Engineering (FKE), Universiti Teknikal Malaysia Melaka (UTeM) in collaboration with seven FKE Committees and the FKE student association (SAFE) have successfully organized a program that was held for the first time, namely Research and Innovation Engineering Day 2022 (RADIATE'22). This program has combined 4 presentations of FKE student projects in Semester 2-2021/2022 which includes students of Year 2,3,4 Bachelor Degree in Electrical Engineering (BEKG), Bachelor Degree in Mechatronic Engineering (BEKM) and Diploma in Electrical Engineering (DEK) at FKE. This program was held face-to-face at FKE's laboratories and administration building on 15 June 2022 from 8.30 am to 2.00 pm which ended with the Closing Ceremony & Prize Giving Ceremony).

This program is one of the evaluation instruments used in highlighting and unearthing the creativity and innovation of students. During the evaluation process, students' soft skills,



project success and impact on industry and society were evaluated. RADIATE 2022 has handed out 35 RADIATE Awards which crown the 10 best projects from each category of FYP, IDP, ProDip and the 5 best projects from EPIC, while 17 Industry Special Awards which are contributions from RADIATE'22.



Recipient of special industry award (IEEE OES Malaysia Chapter).



Some of FKE UTeM students involved in RADIATE'22.

## Upcoming Events: Underwater Robot Challenge 2022 & The IEEE 9th International Conference on Underwater System Technology: Theory and Applications (USYS'22)

Reported by Zainah Md. Zain & Mohd Shahrieel Mohd Aras

The next event that has been planned is the Underwater Robot Challenge 2022 that will be held on 19 November 2022. This event is opened to all primary school and secondary school in Malaysia. Next, The IEEE 9th International Conference on Underwater System Technology: Theory and Applications (USYS'22) will be held on 5–6 December 2022. This is the 1st USYS conference that will be held after pandemic COVID'19 with hybrid mode (face to face and online) after USYS'20 has been cancelled due to pandemic.

**UNDERWATER ROBOT CHALLENGE 2022**  
Open to Primary School and Secondary School

Date : 19 November 2022  
Venue : Universiti Malaysia Pahang, Pekan Campus

**About IEEE OES and Underwater Robot Challenge 2022**  
The IEEE Oceanic Engineering Society (IEEE OES) Malaysia Chapter is one of the IEEE branch in Malaysia, has been around for many years. Besides, organizing activities for professional engineers, lecturers, engineering students and school students, this year IEEE OES Malaysia Chapter collaborates with Faculty of Electrical and Electronics Engineering Technology, Universiti Malaysia Pahang (UMP) and Universiti Teknikal Malaysia Melaka (UTeM) to organize different STEM programs for school students, supporting by IEEE TryEngineering under IEEE Pre-University STEM Portal Grant Program. This program is a National Underwater Robot Challenge for senior and junior students.

**STEM - Underwater Robotics Workshop**  
Session 1: Introduction to the ocean sciences  
Session 2: Underwater robotic platform design (ROV development)  
Session 3: Testing (competition)

**Join us for briefing session on**  
15 August 2022 (Virtual - WEBEX)

**Competition Rules**

1. Open to all secondary and primary schools in Malaysia. Participation fee is FREE.
2. Only ONE team is allowed for each school, with maximum of 3 students and one advisor/supervisor.
3. Each entry will receive an allocation that has been set by Secretariat.
4. The maximum allowed project size (ROV) is 50 cm (Length) x 50 cm (Width) x 50 cm (Height) only.
5. Can use wired or wireless and have a maximum of 4 thrusters.
6. The winner is determined by the fastest time to complete all the given tasks without errors.
7. The Jury's decision is final.

**Competition Tasks**

Start 2m Obstacle 1 and 2 1m Target

Obstacle 3 10m Obstacle 4 10m Target

40 cm

**Registration Link**

**1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> :**  
Trophy + Certificate + Cash  
Certificate of participation for all participants.

**IEEE**

Underwater Robot Challenge 2022 brochure.

**IEEE**  
The 9th International Conference on  
**Underwater Systems Technology:  
Theory and Applications (USYS'22)**  
5 & 6 December 2022  
Kuala Lumpur, Malaysia

Welcome to the IEEE 9th International Conference on Underwater System Technology: Theory and Applications (USYS'22). The hybrid conference will be held in collaboration with International Islamic University of Malaysia and Northwestern Polytechnical University on the 5<sup>th</sup> to 6<sup>th</sup> December 2022. This conference aims to provide a platform for researchers, scientists, engineers, academicians, and industrial professionals from around the world to share, discuss, and disseminate their current research and development activities and experiences in the field of underwater system technology, including relevant theories and applications. The 9<sup>th</sup> IEEE USYS'2022 focuses on developing new engineering strategies for the preservation of the ocean's eco-system, as well as providing a specialized forum for discussing the future of underwater system technology.

**TOPICS**

USYS'22 is seeking original, unpublished submissions for oral presentation. The topics of interest are, but not limited to:

- Underwater Vehicle Technology**
  - Underwater Vehicle, ROV, AUV, Hybrid
  - AUVs Docking and Retrieval System
  - Underwater Vehicle for Shallow Water
  - Underwater Vehicle for Deep Water
- Artificial Intelligent Subsea System**
  - Vision System for Underwater Application
  - Adaptive Path Planning & Navigation for AUV
  - Advanced Underwater Object Ranging & Tracking
  - Intelligent Navigation Guidance & Obstacle Avoidance
- Subsea Applications**
  - Underwater Communication Systems
  - Non-acoustic Sensors for Marine Environment
  - Renewable Energy Sources
  - Electric Propulsion System
  - Battery Storage System
- Control Systems**
  - Underwater Robot Arm
  - Intelligent Task-Oriented Control Architecture
  - Simultaneous Localization and Mapping (SLAM)
- Ocean Science and Engineering**
  - Marine Biology
  - Fishery Technology
  - Climate Change
- Underwater Acoustics**
  - Imaging Techniques
  - Sensors and Instrumentation
  - MEMS-based Systems
  - Acoustic-based Communication
- Industrial Applications**
  - Underwater Inspection and Mapping
  - Pipeline Tracking & Maintenance
  - Deep-water Structure
- Software Engineering and Simulation**
  - Virtual Collaborative Simulation Software
  - Predictive Virtual Environment
  - Seafloor Mapping Techniques

**CONFERENCE FEES**

Participant	International (After 19 <sup>th</sup> Nov)	Local (After 19 <sup>th</sup> Nov)	Local (After 19 <sup>th</sup> Nov)
IEEE Regular	USD 148	RM550	RM600
Member	USD 139	RM 700	RM 700
Non-IEEE	USD 179	RM 750	RM650
IEEE Student	USD 152	RM 600	RM600
Non-IEEE Student	USD 158	RM 650	RM 650
IEEE Student	USD 175	RM 750	RM 750

**WORKSHOP PROCEDURE**

Papers must be written in English and should describe original work, which has not been published or being reviewed for other conferences. Please submit the full paper in doc or pdf format limited to six pages. Accepted paper will be sent to IEEE Xplore for indexing (subject to fulfilling the IEEE regulations).

**CONFERENCE HOST**  
IEEE Oceanic Engineering Society Malaysia  
International Islamic University Malaysia  
Northwestern Polytechnical University China

**IMPORTANT DATES**

Deadline for Full-paper: 31<sup>st</sup> July 2022  
Notification of Acceptance: 31<sup>st</sup> August 2022  
Submission of Camera Ready Manuscript: 30<sup>th</sup> September 2022  
Ready Manuscript: 1<sup>st</sup> November 2022

**SUBMISSION WEBSITE**  
<https://easychair.org/conferences/usys2022>

**CONTACT**  
Secretariat of USYS 2022,  
International Islamic University Malaysia  
Jayan Gombak, 63100, Selangor  
Telephone: 03-6211 5421  
Email: usys2022@gmail.com  
Website: <https://easychair.org/conferences/usys2022>

**ORGANISING COMMITTEE**  
Chair: Mohd Shafieel Mohd Aras, UTeM Malaysia  
Co-Chair: Jian Gao, NWPU, China

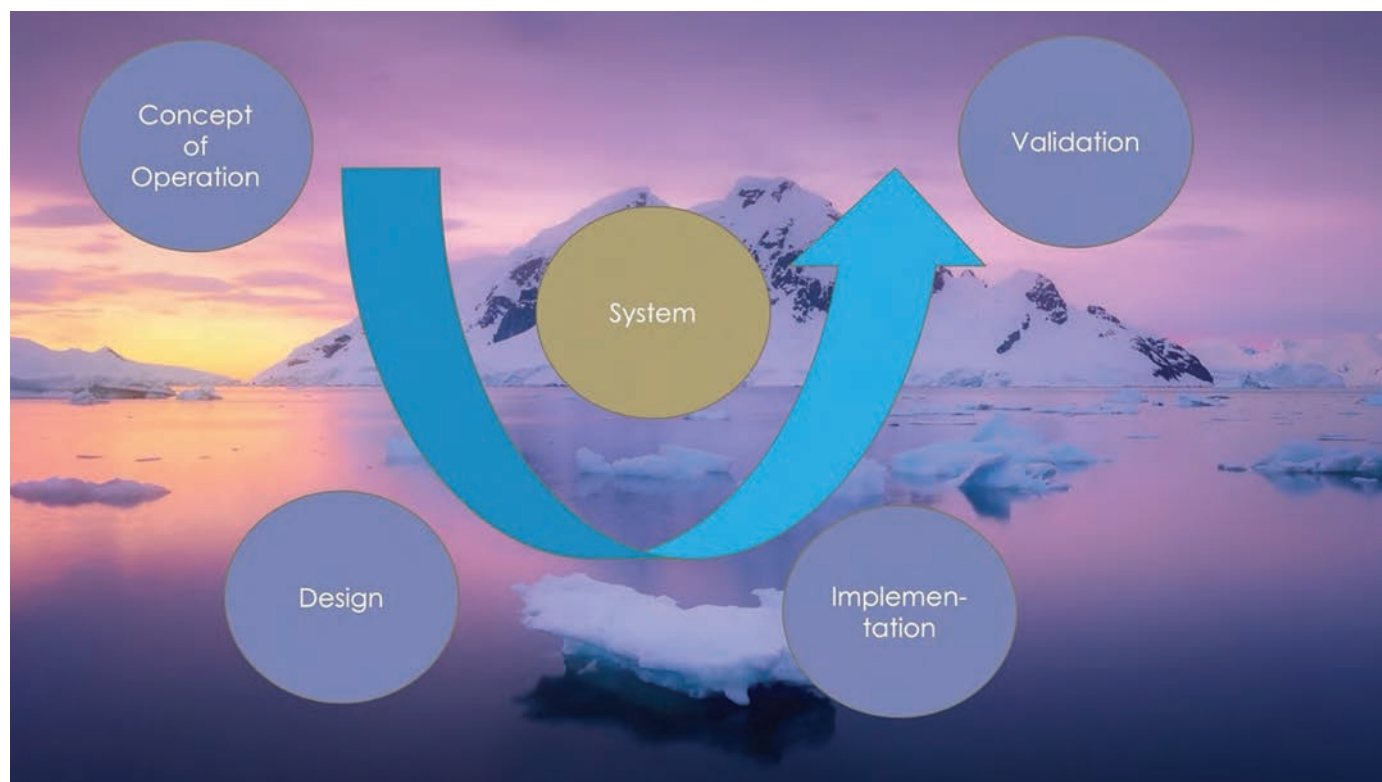
**CONFERENCE SECRETARIAT**  
Zainah Md. Zain, UTM, Malaysia  
Ahmad Ibrahim Ibrahim, IUM, Malaysia

**TECHNICAL COMMITTEE**  
Ahmad Anas Yusof, UTeM, Malaysia  
Ahmad Faisal Mohamad Ayub, UTM, Malaysia  
Hendriawan Abd Kadir, UTeM, Malaysia  
Heping Li, NWPU, China  
Huizhen Yang, NWPU, China  
Khalid Azmi Isahak, IUM, Malaysia  
Khalid Isa, UTeM, Malaysia  
Maliq Arman Morsli, IUM, Malaysia  
Muhyie Md. Idris, UTM, Malaysia  
Mohamed Faisal Abd Rahman, UTeM, Malaysia  
Mohd Rizal Arshad, UTM, Malaysia  
Mohd Faisal Nor Azmi, UTeM, Malaysia  
Mohd Ridwan Hady Yaacob, UPSI, Malaysia  
Mohd Ridwan Zulfakar, UTM, Malaysia  
Muhammad Abdullah, IUM, Malaysia  
Nadira Hordin, UTM, Malaysia  
Raz Alzade bin Ali Hussain, STRIDE, Malaysia  
Rizal Mohd Nor, IUM, Malaysia  
Rosnawati Mond Mokhtar, UTM, Malaysia  
Ryzei Basal Azhar Ali, UTM, Malaysia  
Yanyan Sedo, IUM, Malaysia  
Xingqiang Peng, NWPU, China  
Yimin Chen, NWPU, China  
Zainah Md. Zain, UTM, Malaysia  
Zhao Zhong, NWPU, China  
Zohd Hani Ismail, UTM, Malaysia

USYS'22 brochure.

# A Fresh Look at Systems Engineering Methods for Ocean Observations

**Stephen Holt, Christoph Waldmann, OES Standing Committee on Standards**



*Ingredients of Systems Engineering.*



*Stephen Holt*



*Christoph Waldmann*

Systems engineering is a well-known concept for engineers in different disciplines. It has moved into ocean sciences when the complexity has risen above a certain level, for instance in the planning and design of new observing platforms and systems.

The core of the concept is formed by the collection and documentation of all requirements and subsequently linking them to the context and the system components.

The field of Ocean Engineering embraces the practices of formal Systems Engineering as part of its process. As such, the IEEE Ocean Engineering Society Standards Committee cooperates closely with the IEEE Systems Council Standards Committee on matters related to Ocean Systems Engineering. The IEEE Systems Council Standards Committee does not produce new standards related to the discipline of systems engineering since this field is involved more with processes and methodologies than with a set of specific standards per se. However, these two IEEE Standards Committees can recommend, as guidance, specific documents, texts, guidelines, etc., related to employing systems engineering principles, which are commonly accepted in academia, industry, and government from various countries. A list of examples follows on their website at: [ieeesystemscouncil.org/standards](http://ieeesystemscouncil.org/standards).





# IEEE Oceanic Engineering Society

## IEEE OES OCEAN DECADE INITIATIVE

### recent activities

- Ocean Decade Ambassador program
- Earthzine coverage of Ocean Decade event
- Ocean Decade Chapter funding
- Design the Future Ocean workshops
- Expert planery talks
- Planet Positive 2030 campaign by IEEE

### general activities

- Support Young Professionals (YP) of IEEE OES to engage with the UN Ocean Decade Early Career Ocean Professionals Programme
- Increase community awareness in coastal communities
- Facilitate the expansion of ICT into ocean observations, data assimilation, modelling etc. through workshops, and special events.
- Increase pre-university awareness high-school competitions relevant to Ocean Decade actions.
- Promote the engagement of developing countries in Ocean Decade activities.



## ABOUT THE IEEE OES OCEAN DECADE INITIATIVE



### Vision

Increase Ocean Decade awareness and support the global ocean science and technology communities in achieving the Ocean Decade and Sustainable Development Goals.



### Mission

Using OES as a resource for engineering expertise and a place to learn about technological advancements for **“the Science we need for the Ocean we want”**.



### Project

Boot-strapping the participation of OES and our members in the UN Ocean Decade.

Promoting recognition of members and their activities that align with the goals of the Ocean Decade.

Creating incentives for members and OES communities to become aware and make others aware of the Ocean Decade





## IEEE OES OCEAN DECADE INITIATIVE

### EXPECTED OUTCOME

Through this initiative, we expect,

- a majority of our membership to be aware of the Ocean Decade
- a measurable increase of awareness in conference attendees and exhibitors
- a significant number of presentations at our workshops and symposia that specifically address technology challenges posed by the Ocean Decade.

Elements of the initiative will be integrated into the normal operations of various parts of the society, including chapters, technology committees, workshops, symposia and the OCEANS conference.

# THE OCEAN DECADE

**10 Years. 10 Challenges. 1 Ocean.**

1. Understand and beat marine pollution
2. Protect and restore ecosystems and biodiversity
3. Sustainably feed the global population
4. Develop a sustainable and equitable ocean economy
5. Unlock ocean-based solutions to climate change
6. Increase community resilience to ocean hazards
7. Expand the Global Ocean Observing System
8. Create a digital representation of the Ocean
9. Skills, knowledge and technology for all
10. Change humanity's relationship with the ocean



A vibrant underwater photograph of a coral reef. In the foreground, a yellow and white striped fish swims towards the left. To its right, a large, dark, textured coral formation rises from the seabed. Several smaller fish are visible in the background, swimming in the clear blue water. The overall scene is bright and colorful, showcasing the biodiversity of the ocean.

## **2021 - 2030** **What is the UN Ocean Decade?**

### **The Science We Need For The Ocean We Want**

**The 'Ocean Decade',  
is a 'once in a lifetime' opportunity for  
ocean actors across the world to come  
together to generate knowledge and  
foster the partnerships needed to  
support a well-functioning, productive,  
resilient, sustainable and inspiring  
ocean.**

**Oceans are our largest and most  
important ecosystem for human  
survival on Earth.**

## UN OCEAN DECADE 2021 - 2030

---

### BACKGROUND

---

The United Nations Decade of Ocean Science for Sustainable Development 2021-2030

(referred to as 'the Ocean Decade') was proclaimed by the 72nd Session of UN General Assembly (UNGA) on the 5th of December 2017.

The Decade is being coordinated by a small team (referred to as the Decade Coordination Unit - DCU) within the Secretariat of the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) in an effort to promote transformational, large-scale change to advance urgent action on moving from the 'ocean we have' to the 'ocean we want'.

---

[WWW.OCEANDECADE.ORG](http://WWW.OCEANDECADE.ORG)





---

# OES Conference Calendar

**Qianyi Yang and Muhammad Mohsin, OES Calendar Coordinators**

## **OCEANS 2022 Hampton Roads**

October 17–21, 2022

Hampton Roads, Virginia

<https://hamptonroads22.oceansconference.org>

## **OCEANS 2023 Limerick**

June 5–8, 2023

Limerick, Ireland

## **OTC**

### **OTC 2023**

May 1–4, 2023

Houston, U.S.A.

<https://www.otcnet.org>

### **OTC Brazil**

October 24–26, 2023

Rio de Janeiro, Brazil

<http://www.otcbrasil.org>

## **OES Sponsored**

### **AUV 2022**

September 19–21, 2022

Singapore

<https://www.auv2022.org>

### **SAUVC 2022**

In-Person, September 23–26, 2022

Singapore

<https://sauvc.org>

### **BTS 2022**

September 25–October 2, 2022

Biograd na Moru, Croatia

<http://bts.fer.hr>

## **MetroSea 2022**

October 3–5, 2022

Milazzo, Italy

<https://www.metrosea.org>

## **USYS 2022**

December 5–6, 2022

Kuala Lumpur, Malaysia

<https://oes.ieeemy.org/about-us/ieee-usys-2022/>

## **UT23**

March 6–9, 2023

Tokyo, Japan

<http://www.ut23.org>

## **SusTech 2023**

April 19–22, 2023

Portland, Oregon, U.S.A.

<https://ieee-sustech.org>

## **Non-OES**

### **RobotX Challenge 2022**

November 11–17, 2022

Sydney, Australia

<https://robotx.org/programs/robotx-challenge-2022/>

Please contact us if you have any information about non-OES events that OES members are involved in.

# The Robotics for Asset Maintenance and Inspection (RAMI) 2022

**Gabriele Ferri<sup>1</sup>, Alessandro Faggiani<sup>2</sup>, Tommaso Fabbri<sup>2</sup>, and Fausto Ferreira<sup>3</sup>**

**<sup>1</sup>RAMI 2022 Technical Director, <sup>2</sup>RAMI2022 Deputy Technical Director,**

**<sup>3</sup>RAMI 2022 Head Judge, VP Workshops & Symposia**

NATO-STO Centre for Maritime Research and Experimentation (CMRE) has been organising Student AUV Challenge—Europe (SAUC-E), the premier European student competition for underwater vehicles, since 2010. Over the years, we have been fostering the use of heterogeneous robots in our competitions. In SAUC-E we have given teams the possibility to deploy also marine surface vehicles, introducing tasks that required robot cooperation. In fact, only teams composed of cooperative heterogeneous robots can be effective in solving complex tasks in real world scenarios. This interest led CMRE to locally organise the euRathlon 2015 Grand Challenge at Tor del Sale power plant site (Piombino, Italy) in September 2015. euRathlon 2015 Grand Challenge, organised in the framework of the euRathlon EU project, was the first world's multi-domain robotics competition. Disaster response tasks were proposed to teams composed of land, sea and air robots. The inspiration came from the Fukushima 2011 accident.

This formula of multi-domain competitions has continued with the European Robotics League (ERL) Emergency. ERL is a common framework for robotics competition funded by the European Union. ERL was launched in 2016 in three vibrant fields of robotics: industrial, service and emergency robots. The first season culminated with the ERL Emergency 2017, a multi-domain competition again locally organised by CMRE at the Tor del Sale power plant site in Piombino. ERL Emergency 2018 and 2019 took place again in La Spezia and were planned to take place in 2020 and 2021 but the COVID-19 pandemic made it impossible to have physical competitions.

For 2022, we have started a new competition named Robotics for Asset Inspection and Maintenance (RAMI). RAMI is part of the ERL Emergency League and is organised in the framework of the EU-funded METRICS project (<https://metricsproject.eu/>) aiming at addressing Inspection & Maintenance (I&M) tasks achieved in risky and/or hostile environments where human intervention is challenging or impossible, where direct link with an operator could not be guaranteed and where autonomous decisions are necessary to reduce operational time of the inspection tasks and ensure repeatability while maintaining an appropriate safety level for the mission. RAMI competition has events for aerial robots, organised by CATEC (Spain), and for underwater vehicles organised by CMRE. RAMI 2022 is the first RAMI event which we have conducted at La Spezia in July 2022.

## The Competition

CMRE hosted this year the RAMI 2022 robotics competition from 10 to 15 July after a two year interruption due to

COVID-19 pandemic. The competition took place in CMRE water basin. The areas were prepared to simulate an Oil&Gas plant in a harbour connecting it to the general theme of the RAMI competition: inspection&maintenance (I&M). To support teams' growth, we also proposed tasks similar to those present in ERL Emergency 2019.

Underwater robots were challenged to inspect a pipe structure, reach several waypoints and pass through a validation gate. In addition, several buoys of four possible colors had to be detected, localised and their colour recognised. A different action was requested of the teams depending on the buoy color: for instance, turning around the buoy in a clock-wise circle or stopping for 30 seconds increasing the depth. The objective was to force teams to integrate perception with adaptive mission planning in a realistic environment such as CMRE water basin. Finally, three manipulation tasks were added: staying into contact with the pipe, valve closing and picking up a stick bringing that to the surface in a controlled way. These tasks were the only ones allowed to be performed through teleoperation (ROV mode), while all other tasks had to be performed autonomously. As in the previous editions, the challenges were held at the CMRE waterfront sea basin, which is a sheltered harbor, providing participants with the opportunity to grapple with real-life sea conditions, including limited visibility and salty water, but within a safe, controlled environment. The limited visibility added severe difficulties to object recognition by AUVs, even if the targets were bright orange or red in color.

Nonetheless, several teams were able to tackle the tasks, achieving many goals. Out of the 4 marine teams registered, all tested their vehicles in the water. We tried to provide the teams as much time as possible to test their robots in the water basin.

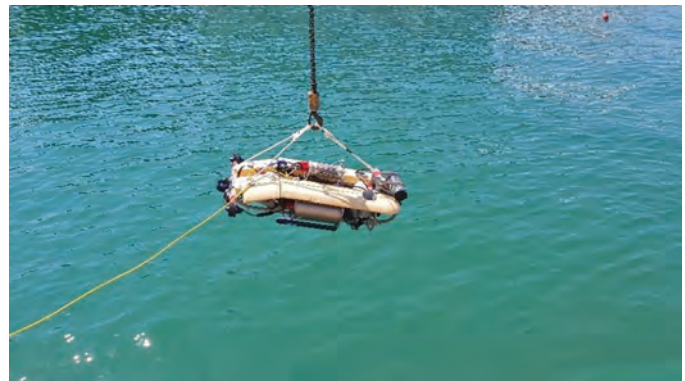


Figure 1. The new vehicle developed by AUV Team TomKyle.

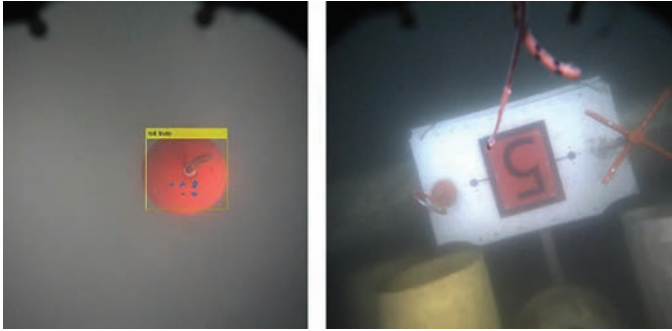


Figure 2. (Left) Tomkyle detection and classification of a red buoy. (Right) An image of the manipulation console with a number to be recognised. The valve and the stick to be grabbed are visible.

Only testing the robots in the water can allow teams to solve the technical issues and to prepare the robots for the proposed tasks. To support the practice at sea, a test arena containing the objects to be detected and one manipulation console was also prepared next to the competition area. This allowed the teams to collect data, for instance to acquire images of the colored buoys to train and test their classifiers.

We have noticed with pleasure that, despite the COVID-19, teams performance generally has grown over the past years. We have seen significant and steady progress in several teams and a constant look for improvement. The two top teams had accomplished several tasks, mainly in navigation, survey and manipulation. The rookie team managed to score some points as well. A fourth team had a significant hardware issue during the week that prevented full runs in the competition arena.

## The Participant Teams

This year 4 teams (of which one joint team by two universities) participated. Although initially more teams expressed their interest (including teams from the U.S.), uncertainty regarding COVID-19 travel restrictions made some teams cancel their participation. It is to be noted that after 2 years without competitions, some teams lost continuity as students graduate and there was no overlap between older generations and younger ones. This is why it is important to organise annual competitions, to support team participation and the succession with the required handover of experience. To start after the COVID-19 period, we think it is pivotal to involve people, to strengthen the community, contacting possible participants and sponsors. This year, we had the participation of two teams that had attended many of our past events. One team participated again in our events, after ERL17. A new team was also present. This was possible through a joint international venture, between two universities. This followed previous collaborations the two institutions had in the framework of the EUMarineRobots project, an EU-funded project aiming to make marine robotics infrastructures available to researchers for some specific projects. That team was mentored by a previous participant in SAUC-E 2012, which shows the virtuous circle of students participating in our events that later find a job in marine robotics and then become mentors. Of the competing teams, three had previously partici-



Figure 3. Teams with their awards.

pated in our competitions, showing how ERL/SAUC-E is today a fixed appointment for several European research groups.

## The Participant Teams Were

- 1) AUV Team TomKyle; from the University of Applied Sciences of Kiel, Germany. This team has participated since 2014 in our competitions yearly.
- 2) UNIFI Team; from the University of Florence, Italy. A veteran of our competitions (first participation in 2012).
- 3) OUBOT; from the Obuda University, Budapest, Hungary. This team had participated in euRathlon 2015 and ERL Emergency 2017. In these competitions, they participated thanks to an AUV loaned by the organisation. This year, they participated with a robot they built.
- 4) Black Pearl; from the University of Pisa (Italy) and Jacobs University (Germany). This team participated for the first time and included graduate students from Italy and undergraduate students from Germany.

## The Winners

RAMI 2022 was a hard-fought competition for the three days dedicated to three different Task Benchmarks (TBMs): Pipeline area inspection on Wednesday, Intervention on the pipeline structure on Thursday and finally the Complete mission at the plant on Friday. AUV Team TomKyle and UNIFI Robotics Team challenged in the three TBMs, each one winning one TBM and having a draw in the Intervention on the pipeline.



Figure 4. The winners with Gabriele Ferri.



AUV Team Tomkyle was finally awarded with the first RAMI 2022 award, by evaluating the results in the three TBMs and considering the results in the presentation the teams gave to the judges about their robots.

The winners of the RAMI 2022 were:

- 1st Place—AUV Team TomKyle.
- 2nd Place—UNIFI Robotics Team
- 3rd Place—Black Pearl.

Other prizes awarded were:

- “Best Rookie Award”—Black Pearl.
- “Persistency Award”—OUBOT.
- “Best Presentation”—AUV Team TomKyle

## Feedback

The feedback from both the participants and the judges was very positive. Teams reported good results in tasks, which are becoming harder and harder every year in order to support the gradual growth of participant teams and to push in some cases the state of the art. At the same time, it is felt the need to keep or create some simple tasks for the newcomers. We will try to achieve this trade-off in the future, to be attractive both for new entries, and for more experienced teams, which require more challenging tasks for developing and testing their capabilities. The realistic scenario, which attract participants, is also central to involve end-users and companies. This year, for instance, we had one judge from SAIPEM and one from ROSEN group. Following previous feedback, during the assessment of team performance, more points were awarded to achievements involving autonomy. This is thought to push teams to focus on autonomy and advanced perception. Results of RAMI 2022 showed good performance for autonomous navigation, mapping, imaging and tele-operated manipulation, while further work is needed for real-time perception and autonomy. This will be addressed in next year’s competition. Furthermore, to develop teams’ perception skills and algorithms, a virtual RAMI challenge is ongoing. In the virtual challenge we provide teams with an underwater image dataset for developing image processing software. This is also important since in the underwater domain there is lack of available datasets for developing and validating new image processing algorithms

## The Judges

This year we had a large pool of judges and visitors coming from all over Europe and the U.S. We are pleased to thank IEEE OES, Italian Army, Italian Navy, SAIPEM (Italy), ROSEN Group (Germany), Robonation (U.S.), Office of Naval Research (ONR) (U.S.) and the H2O Robotics (Croatia) who provided exceptionally qualified judges, increasing the quality of the competition. Dr. Fausto Ferreira (University of Zagreb, Croatia), the OES VP for Workshops & Symposia, was the Head Judge and visited us in the framework of the IEEE OES committee Marine Autonomous Systems Competitions Coordination (MASC2), working globally to standardise student marine robotics.

The local community was also engaged. Local schools from the La Spezia area were also involved in the framework of Giona’s Project. This allowed around 20 students close to high school graduation to come and interact with the teams.

## Sponsors

As in previous years, IEEE OES played a fundamental role as the Main Sponsor. One of the RAMI goals is to educate future multi-disciplinary engineers. Therefore, the sponsorship of ‘Breaking the Surface’ 2022, the 14th Interdisciplinary Field Workshop of Marine Robotics and Applications, is well aligned with our mission. The organisers of ‘Breaking the Surface’ provided 1 complimentary registration to the best rookie team, 1 to the best team and 1 to the second best. These students will have the opportunity to participate in the 14th edition of this multi-disciplinary and educational workshop that, since 2019, counts with the IEEE OES sponsorship.

As in the past, we had again the marine robotics commercial sector involved. Blue Robotics gave a Ping echosounder to the team that won the Persistency award.

Our aim is to continue to develop RAMI as a unique event that challenges teams with realistic conditions, with an emphasis on precise metrological evaluation. These achievements were made possible thanks to the fundamental support of IEEE OES and all our other sponsors. We thank all the teams, judges, presenters, visitors, staff and everyone involved, who made RAMI 2022 such a successful event.

**24–26 OCTOBER 2023**  
**SulAmérica Convention Center,**  
**Rio de Janeiro, Brazil**





SYMPOSIUM 2022, 19-21 SEP

IS GOING **HYBRID** !

WITH BOTH VIRTUAL & IN-  
PERSON PROGRAMS

EARLY-BIRD REGISTRATION  
DEADLINE: 31 JULY

---

NOW ACCEPTING NOMINATIONS FOR AUV  
**MID-CAREER RISING-STAR AWARD** &  
**LIFETIME ACHIEVEMENT AWARD**

DETAILS AT [AUV2022.ORG](http://AUV2022.ORG)



**PATRONS**





# SINGAPORE AUV CHALLENGE

*is back*



23-26 SEPTEMBER 2022  
SINGAPORE POLYTECHNIC

DESIGN TO COMPETE.  
DESTINED TO EXPLORE.

## OCEANS 2023 Limerick

CONFERENCE & EXPOSITION

5 - 8 June, 2023  
Limerick, Ireland

Blue Ocean Planet Earth

300+ ATTENDEES, 500+ TECHNICAL PAPERS,  
60+ EXHIBITORS, UNLIMITED OPPORTUNITIES  
[limerick23.oceansconference.org](http://limerick23.oceansconference.org)



**2022** 25.09. - 2.10.  
Biograd na Moru, Croatia

# BREAKING THE SURFACE

**14<sup>th</sup>** INTERNATIONAL INTERDISCIPLINARY FIELD WORKSHOP  
OF MARITIME ROBOTICS AND APPLICATIONS

Registration for Breaking the Surface 2022  
are now open at [bts.fer.hr/registration](https://bts.fer.hr/registration)

Early bird deadline: **1st July**

 [bts@fer.hr](mailto:bts@fer.hr)

 [bts.fer.hr](https://bts.fer.hr)

 [facebook.com  
/BTSCroatia](https://facebook.com/BTSCroatia)



**> 140**  
ATTENDEES



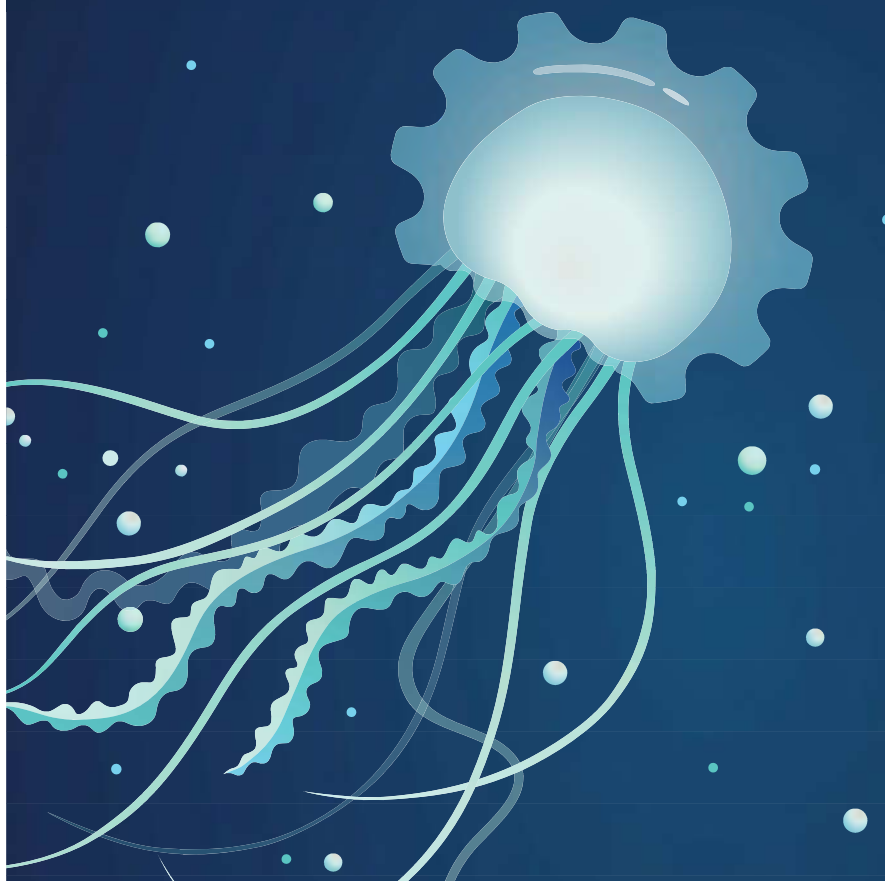
**25**  
LECTURES



**10**  
TUTORIALS



**5**  
PROGRAMME  
TRACKS



**Submit the abstracts by September 16!**



## **International Symposium on Underwater Technology March 6-9, 2023**

**In Person Meeting (with webinar option)**

**IIS Conference Hall "Haricot" Tokyo, Japan**

**– Advanced Underwater Technology for the Ocean –**

**URL: <http://www.ut23.org>**

The University of Tokyo is delighted to welcome international experts for the International Symposium on Underwater Technology (UT23). UT23 will provide you with a thematic umbrella under which attendees will discuss the problems and potential long-term solutions that concern not only the Pacific Rim countries, but the world in general.

### **Conference Scope**

Environmental Monitoring, Marine Robotics, Marine Mineral Resources  
Renewable Energy, Marine Construction, Observatory and Disaster Mitigation  
Fishery Engineering, Acoustics and Communications, Sensors  
**Special Topic: Remote Observation and Cloud Computing**

### **Important Dates**

Abstracts submission page open: April, 2022  
Deadline for Abstract Submission: **September 16, 2022**  
Notification of Acceptance: October 14, 2022  
Deadline for Paper Submission: December 9, 2022  
Deadline for Early Registration: January 20, 2023  
Symposium Dates: March 6-9, 2023

### **Organizers**

IEEE Oceanic Engineering Society (IEEE/OES)  
IEEE/OES Japan Chapter  
Institute of Industrial Science (IIS), the University of Tokyo  
Earthquake Research Institute (ERI), the University of Tokyo **Exhibition Opportunities**

In conjunction with UT23, there will be a limited number of booths for technical exhibition. We hope you would take this opportunity to display your products at the symposium. There are also opportunities for supporting the symposium. For more information, please contact the secretariat at [info@ut23.org](mailto:info@ut23.org)

For more information about UT23, please contact:

UT23 Secretariat: [info@ut23.org](mailto:info@ut23.org)





# A Blast from the Past! ... Student Poster Competitions

**Bob Wernli—Beacon Co-Editor-in-Chief and Photographer Stan Chamberlain**

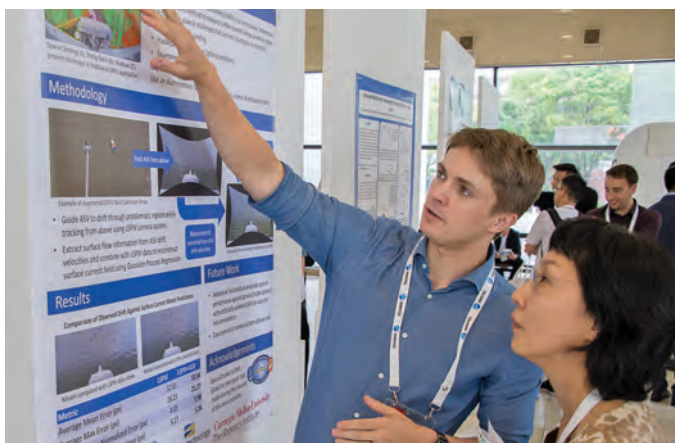
*A major effort in OES is to ensure that we have an excellent Student Poster Competition (SPC) at each OCEANS conference. Why? To expose these students to our society, the technologies that we address and introduce them to networking with other professionals. Does it work? It certainly does. As an example, AdCom member and our Technology Committee Coordinator, Shyam Madhusudhana, is shown in the below photo as he participated in the OCEANS 2010 Bremen conference SPC.*



OCEANS 2010 Bremen—Norman Miller and students and young researchers Shyam Madhusudhana, Adrian Bodenmann, and Tania Lado Insua.



OCEANS '10 Seattle—Student Poster Student Michael Shives and Norm Miller.



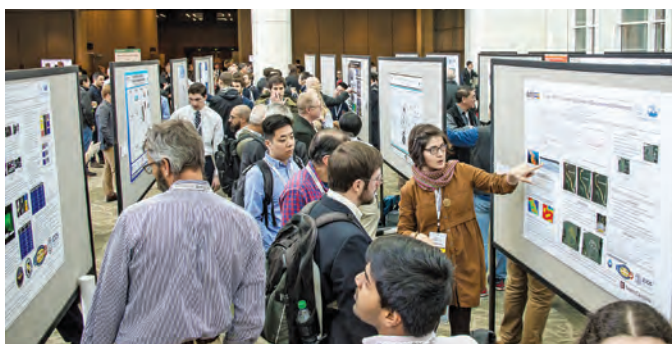
OCEANS '18 Kobe—Harumi Sugimatsu judging the poster of Christopher Tomaszewski.



OCEANS '11 Santander—Student Poster Winners.



OCEANS '21 San Diego—First Place Winner of the Norman Miller Award—Schuyler Nardelli, Rutgers Univ.



OCEANS '19 Seattle SPC judging.



# OCEANS 2022 Hampton Roads is on the Horizon

## Ray Toll, OCEANS 2022 Hampton Roads Co-Chair



OCEANS 2022 Hampton Roads is just a few months away, and all the planning since 2017 is about to bear fruit. Our Local Organizing Committee is unusually large, strong and diversified, resulting in a true whole of government/community approach to our conference theme, COASTAL RESILIENCE: ADAPTING TODAY TO SECURE TOMORROW. Our schedule is getting full as interest remains high

with close to 600 abstracts received and processed. We have an impressive list of speakers to set the tone for what should be a very productive and informative week for all attendees at the Virginia Beach Convention Center.



*Virginia Beach Convention Center.*

A few highlights that make OCEANS 2022 Hampton Roads unique:

- For the first time in conference history, NASA is playing a leadership role in conference planning and participation thanks to our NASA co-chair Laura Rogers.
- Also, for the first time, Atlantic Submarine Headquarters is playing an active role with SUBLANT Technical Director Dr. Marty Irvine as an honorary chair. Through his leadership, Naval Sea Systems Command and many Navy Labs are participating in some capacity.
- We are honoring the late Dr. Larry Atkinson, Old Dominion University Professor, who not only lead the nation in coastal resilience research and integrated ocean observing, but played a key role in both OCEANS 2012 Hampton Roads and this year's conference.
- We have created the Educational Village on the exhibit floor, allowing Universities and NGOs, and small businesses to showcase their products and research in marine technologies.
- Among the special panels being organized, A Decade of the Oceans panel will address the cross-cutting themes identified by the UN Decade Committee.

Another key aspect to this conference is how we are promoting the mutual technologies and organizations from West Coast to East Coast, springboarding from OCEANS 2021 San Diego this past September to Hampton Roads, followed in 2023 by



*Virginia Beach.*

the Gulf Coast. For example, the US Navy's largest fleet concentration areas exist in San Diego and Norfolk, followed by the Gulf Coast. A key priority for these conferences has been an attempt to link the problem areas and challenges identified in OCEANS 21 San Diego to potential solutions in OCEANS 22 Hampton Roads. The technical tracks and exhibits will therefore follow similar themes in both.

OCEANS 2022 Hampton Roads is a hybrid conference (in person and virtual), and supported by many schools in the region led by Old Dominion University.

We therefore expect a lively and informative conference with in-water demonstrations. We look forward to seeing you October 17–20, 2022.



*King Neptune on Virginia Beach.*

Visit us at [hamptonroads22.oceansconference.org](https://hamptonroads22.oceansconference.org) for all conference information and updates.



The Oceanic Engineering Society invites you to join us at OCEANS 2022 Hampton Roads for the following Society sponsored events:

### **Throughout the Week**

[Senior Membership](#) Drive at the Society booth

Learn about Ocean Decade Initiative opportunities at the Society Ocean Decade booth

### **Monday, October 17**

Student Mixer 4:00-5:30\*

### **Tuesday, October 18**

OES Annual Meeting and Awards Ceremony

Special Panel: Engineering and Scientific Challenges of Ocean-Based Carbon Dioxide Removal

OES Members Reception

### **Wednesday, October 19**

Young Professionals (YP) Breakfast\*

### **Thursday, October 20**

Women in Engineering (WIE) Breakfast\*

Women's Leadership Luncheon and Town Hall\*

We Hope you can join us! OCEANS 2022 Hampton Roads [Registration Early Bird Deadline](#) is September 12<sup>th</sup>.

\*Co-sponsored with the Marine Technology Society



# OCEANS 2023 Limerick

CONFERENCE & EXPOSITION

5 – 8 June, 2023

Limerick, Ireland

Blue Ocean Planet Earth



## Start planning your next OCEANS!

Save the dates for **OCEANS 2023, June 5-8** and join us in Limerick, Ireland.

The OCEANS conference is the flagship event of the IEEE Oceanic Engineering Society (OES) and the Marine Technology Society (MTS). The event is recognized as the premier forum for the international marine community to meet and discuss technical innovations and current trends in the marine technology sector. OCEANS brings together engineers, industry practitioners, government officials, public-sector executives, researchers and academics from all aspects of the oceanic spectrum.

**OCEANS 2023** will be hosted at the beautiful University of Limerick campus, located on the outskirts of Limerick City. It is the first time that OCEANS will be held in Ireland. The event will feature all aspects of oceanic engineering, science and technology. The conference theme is "**Blue Ocean Planet Earth**".

### Key highlights:

- Over 500 professionally reviewed technical papers, including special focus theme sessions.
- Plenary sessions with leaders from industry, academia, and government.
- 60+ exhibitors showcasing the latest innovations in products and services.
- A student poster session featuring outstanding projects and other student activities.
- Papers presented at the conference are subsequently archived in the IEEE Xplore online research database.
- Tutorials, workshops, demonstrations, government listening sessions, social and networking opportunities, field trips and an attractive social programme.



## Venue and surroundings

The University of Limerick is situated on 130 hectares of beautiful parkland, with the River Shannon as its unifying focal point. Located 4km outside Limerick City, the University is renowned for its superb facilities, well-equipped lecture theatres, sports facilities including a 50m pool, and attractive riverside walks.

The city is based in the Shannon Region, on Ireland's breathtaking West Coast. It is a vibrant place of culture and "craic" (fun), little secrets, and famous locals. Take a walk through Limerick's streets and you'll find stories everywhere.

The Region is the gateway to the Wild Atlantic Way, which offers visitors a chance to see the longest defined coastal driving route in the world, and to take in the amazing Irish landscape.



## Why exhibit at OCEANS?

- Access to a broad network of industry partners from the public and private sector.
- Opportunity to present your newest innovations, products and services.
- Innovation space – the hot spot of the exhibition space provides exhibitors and patrons with an opportunity to hold technical presentations and product demos.
- Hands-on technical workshops to encourage engagement between industry and academia.

[limerick23.oceansconference.org](http://limerick23.oceansconference.org)

Contact us





# OCEANS

---

CONFERENCE & EXPOSITION

---

# 2023

---

# GULF COAST

September 25-28, 2023 | Biloxi, MS | In-Person & Virtual

The OCEANS 2023 Gulf Coast conference is for global maritime professionals to learn, innovate and lead in the protection and utilization of the world's largest natural resource – our OCEANS.



100+ EXHIBITORS



500 TECHNICAL PAPERS



2,000 ATTENDEES



UNLIMITED OPPORTUNITIES





# Who's Who in the IEEE OES

**Shyam Madhusudhana**

**Administrative Committee, Chair of Student Poster Competitions,  
Coordinator of Technology Committees**

I have been an active member of IEEE OES for about 15 years, and I am thankful to the Beacon's editors for giving me this opportunity to share a bit about myself. My career trajectory has been somewhat eclectic, and I believe retracing some of it would make for a good story here. Before that, let's get some usual suspects out of the way—I like coffee, IPA, peaty single-malt scotch and mezcal; I listen to classic rock (Led Zeppelin, Cream), metal (Tool, Metallica, ACDC), grunge (Pearl Jam, Nirvana) and Carnatic music; I enjoy running, hiking, and I love to travel.

Growing up in land-locked Bengaluru in south India, I couldn't have, in the wildest of my fantasies, imagined a calling in an ocean-related discipline. In fact, it was only much later, in my thirties, that I even learned to swim. During my high-school years, having discovered that I was good at computer programming, I spent most summers learning new programming languages and developing computer games. It seemed like I was well poised to ride the wave (no pun intended) on the imminent software industry boom in India in the late 90s/early 2000s. After a bachelor's in computer engineering, goals evolved and I moved to sunny San Diego, California, in 2005 to pursue a master's in computer science. Within a year, I landed a job in a company that developed automatic speech recognition software. But it soon dawned on me that gigs in software industry weren't going to be fulfilling in the long run. Also, I didn't want to see myself surrounded by computer screens and keyboards for the rest of my life.

Fortunately, I did catch a whiff of the "outside world" during my master's. And that, ... was compelling enough! My research thesis involved automating analyses of blue whale vocal activity in passive acoustic recordings from the Pacific. With random luck, I got on a research cruise, on a vessel managed by the Scripps Institution of Oceanography (SIO). My tryst with IEEE OES began in 2008, when I attended the OCEANS con-



*With my former supervisors, Marie Roch (master's; right) and Christine Erbe (PhD; left), at a conference in St Andrews, UK, (2013).*

ference in Kobe, Japan, as a candidate in the Student Poster Competition (SPC), where I presented a part of my master's research. After a second SPC participation, at OCEANS Bremen in 2009, I developed an appreciation for being involved with a professional society. Of course, the natural choice then was the OES. While working fulltime in the software industry, I continued to remain engaged with my master's supervisor, Marie Roch, and other researchers at SIO. With weekends dedicated to playing cricket, I had to "find" time during weekdays to volunteer for OES. After helping resurrect OES' San Diego Chapter, I served as its Secretary and Treasurer for two years. I was even involved in the early stages of planning San Diego OCEANS (2013).

My *no-turning-back-now* moment happened in 2012, when out of the deep blue (again, no pun intended), I received an email from a Christine Erbe—a name unknown to me at the time—with an offer for pursuing a doctoral degree in marine related research. Turned out that my continued engagement in this field did have its dividends, a huge one. Needing to move to Australia and switching disciplines to a profession that I had not much knowledge about, indeed made me anxious. But, needless to say, I went with the flow (sorry, this is the last one, I promise) and grabbed the opportunity. I completed my PhD, in applied physics, from Curtin University in 2016, and have since been very much engaged in ocean-related research.

Whilst in Australia, I was looking to get back into being involved with OES. Along with Malcolm (Mal) Heron and a few others, I was involved in the formation of OES' Australia Chapter in 2013. I also served as the Secretary of the new Chapter for three years. Following the completion of my PhD, I had a short stint as a research associate at the Centre for Marine Science & Technology, Perth. By this time, I had also



*Engaged in my favorite sport—cricket. (San Diego, USA, 2007).*





*Out deploying Rockhoppers—bottom-moored autonomous underwater acoustic recorders—in the Atlantic, (2021).*

gotten into using passive acoustic monitoring (PAM) technology in terrestrial applications. In 2017, after moving back to India, I joined the National Institute of Oceanography as a research associate, where I was engaged in project design and fieldwork planning. It was then that I become more heavily involved with OES. Thanks to Mal, the then VP of Technical Activities (VPTA), who had recognized my volunteer efforts (while in Australia), I was appointed as the Coordinator of Technology Committees, in 2018. Shortly after, in 2019, I was inducted into OES' inaugural YP-BOOST program for young professionals. And, almost immediately, John Watson, who was then the Chair of SPCs at OCEANS conferences, passed on the baton to me.

It was in 2018, that I returned to USA; this time, to NY, for a postdoc at the Center for Conservation Bioacoustics, Cornell University. Originally hired to develop deep learning-based tools for PAM, I have since been engaged in a wide variety of projects—monitoring of endangered baleen whales in the Atlantic and Southern Oceans, developing novel cutting-edge solutions for the effective and efficient automation of analyses of hundreds of terabytes of underwater acoustic recordings, monitoring katydids in Panamanian forests and gibbons in east Asia, helping researchers in central Africa effectively monitor poaching activity, and data collection and assessment of underwater soundscapes around (both in time and space) US Navy's ship-shock trials. As a scientist involved in multiple aspects of cross-disciplinary projects, I now also hold a document that calls me a 'certified tree climber.' I believe in open research, and I actively contribute to the global scientific community. One of my biggest contributions in recent years is the

open-sourcing of the toolbox *Koogu* (<https://shyamblast.github.io/Koogu>), which facilitates rapid development of machine learning solutions in animal bioacoustics.

At present, I continue to work at Cornell University, and am engaged in multiple projects with global collaborations. Looking back, for someone that wanted to run away from a fulltime desk job, I couldn't be happier with where I have gotten. If I am not at my desk coding and debugging programs, or volunteering for OES, you could find me either on a tree or on a boat.



*Deploying autonomous recorders atop a tree in the tropical rainforest of central America, (2019).*



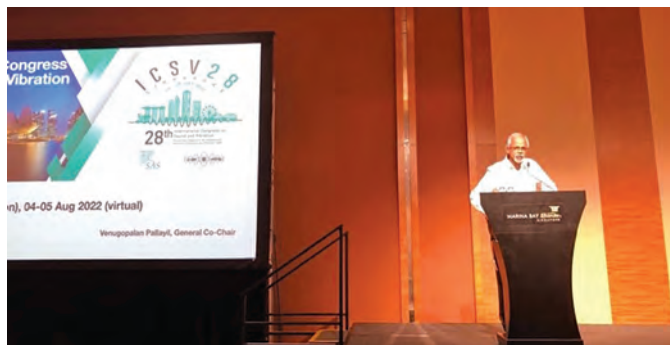
## Member Highlights

*Contact the editors if you have items of interest for the society*

### International Institute of Acoustics and Vibration (IIAV) and International Congress on Acoustics and Vibration (ICSV)

**Venugopalan Pallayil**, VPTA (2021–22), IEEE OES has been elected as a member of Board of Directors of IIAV. His 3-year term starts from 01 Jan 2023. In this capacity he will be providing volunteer services to the IIAV community in its organizational matters. He was the General Co-Chair for the IIAV's flagship conference, namely ICSV, held in Singapore during 25–28 July, 2022, at the Sands Expo and Convention Centre. The conference held in hybrid format had 162 in-person participants and over 200 virtual participants, largely from China. A couple of interesting aspects of this conference are two social events where the contributions from the members and session chairs are valued. There is a session chairs cocktail reception (including plenary speakers) and a 'Member's Nite,' where the members of the society are hosted for a dinner and drinks. This was one of the ideas for proposing an OES member's get-together during OCEANS 2022 Hampton Roads. Such activities can also be used for the promotion of memberships in our society.

The virtual sessions in this conference were held using pre-recorded author presentation videos, but with live Q&A sessions. Each virtual session was also handled by a session chair as if it were in the in-person conferences. 4 to 5 parallel sessions were run over two days to cover the virtual presentations. Most virtual presentations were from Chinese delegates as they were inconvenienced by the travel restrictions. The overall conference was run relatively well and largely accepted by the participants.



*Venu giving the opening address.*



*River cruise at the "Member's Nite"*



*Bhangra dance at the welcome reception.*



*Venu with IIAV President, Prof. Marek Pawetczyk (left) at the Gala Party.*

---

## AdCom Election Results

The election results are in for the 2023–2025 Administrative Committee members. This year we had a great list of 12 candidates from around the world (see their bios in the last issue of the Beacon) and the results were very close. Congratulation to the following six candidates who were elected:



*Shyam Madhusudhana*



*Nikola Miskovic*



*Karen A. Panetta*



*John Watson*



*Albert (Sandy) J. Williams 3rd*



*Stephen Wood*

**Welcome aboard. Now...let's get to work!**

---

## Welcome New and Reinstated Members

### **Australia**

Kevin G Eastment  
Vijay Kumar Oad

### **Canada**

Duane Hawkins

### **China**

YuLin Bai  
Yuanbo Bi  
Zhihao Fan

Feng Hong  
Yun Honglu  
Youdi Kong  
Junping Li  
Rui Lin  
Yinheng Lu  
Chenxin Iyu  
Pei Tianqi  
Rui Wang  
Tongjin Wei  
Hongfei Xie

Li Xinyang  
Kailin Zhang  
Yiming Zhong

### **Colombia**

Hilber Ricardo Lopez  
Moyano  
Astrid Daniela Pena  
Rodriguez  
Brian Rojas  
Juan David Rueda Quiroga

### **Egypt**

Omar Mohamed

### **France**

Allan Badian  
Barbara Nicolas

### **Germany**

Laura Meyer  
Giulio Sistilli



**Greece**  
Ekaterini-Fotini Magouta

**India**  
Milind Lui Fernandes  
Kretika Goel

**Italy**  
Muhammad Adil  
Domenico Curto  
Andrea Guercio  
Anna Verlanti

**Japan**  
Kousei Ishibashi  
Yuki Sekimori

**Korea, Republic of**  
Kyoungsoo Kim

**Kuwait**  
Ahmad Alyousif

**Malaysia**  
Ng Hsiang Boon

**Portugal**  
Bruno Mateus Ferreira  
Antonio Oliveira

**South Africa**  
Ewaoche John Okampo

**Switzerland**  
Giona Adami

Alfio S. Lanuto

**Tunisia**  
Raoua Aloui  
Malek Amara  
Amine Dalleli  
Olfa Hamdi  
Syrine Mansouri  
Daaloul Olfa  
Cyrine Sherni

**United Arab Emirates**  
Ismail Sultan

**USA**  
Thomas G Beck  
Cole Cameron  
Scott D Carlson

Corey Chamblee  
David M Fratanoni  
Nicholas Genco  
Daniel R Gonzagowski  
Tina Haley  
Amanda Hill  
Md Jahidul Islam  
Rachel E Kahn  
Adrienne Lai  
Laura E Lindzey  
Hafeez Opeyemi Oladejo  
Sean Peisert  
Katherine Skinner  
Sean M Wiggins  
Boxiao Yu

## UNIZG SBC Half-Year Activities Report March–July 2022

*Nadir Kapetanović, Anja Babić, Ivan Lončar, Igor Kvasić, Vladimir Slošić, Allan Badian*

### Introduction

It was a busy start of the year for members of the IEEE OES University of Zagreb Student Branch Chapter. As most COVID—related measures have been relaxed, many of the long-due field trials finally got completed. Field trials in bay Bistrina near Dubrovnik as part of the InnovaMare roadshow and field trials in Venice are just some of the sea trial events our members attended lately. Besides that, as every year we participated in the Croatian Festival of Science and took a prestigious award at the 13th International Agriculture Innovation Fair AgroArca in Prelog, Croatia. Most of all, we are excited that our small branch community is growing as visiting students joined our research group and happily shared their experience about working and staying in Croatia.

### Field trials in Bistrina bay, Croatia, April 2022

As a part of InnovaMare project, a so-called roadshow demo event named “Transforming Blue Economy for Sustainable Adriatic Sea” was held on the premises of the Laboratory for Mariculture, University of Dubrovnik in Bistrina bay, Croatia. Our members Anja Babić, Nadir Kapetanović, Vladimir Slošić and Kristijan Krčmar prepared the equipment for the demos on site April 25th–28th, while the main demo event took place on April 29th.

The main objective of the demo was to showcase our autonomous vehicles capabilities and ongoing equipment integrations. This included the autonomous surface vehicle (ASV) Korkyra and its subsystems used in autonomous inspection missions, i.e., surveillance camera, integration with Blueye Pro



*Laboratory for Mariculture, University of Dubrovnik in Bistrina bay, Croatia.*



*Mussel and oyster farm just in front of the Laboratory for Mariculture.*

ROV, a tether management system (TMS) for the ROV, a landing platform for a UAV, and WaterLinked UWGPS G2 system for acoustic underwater localization of the ROV.



*Deployment of the ASV Korkyra is now a 2–4 person job since its weight increased significantly with added subsystems.*



*Initial trimming of the ASV Korkyra and manual control tests with Blueeye Pro ROV tied in front of its TMS on Monday, 25th of April.*

In spite of the issues such as the punctured hull of the ASV Korkyra that was luckily detected on the first day and fixed right away on the next day, most of the performance tests went well. On Wednesday, April the 27th, while ASV Korkyra's hulls were getting dried, we managed to have a secondary setup of the underwater acoustic system deployment, so a rubber boat acted as the baseline of the SBL system. This was followed by a successful integration of the GNSS equipment with the UWGPS G2 system for relative-to-global coordinate frame reprojections. Also, the TMS, controlled based on the measured distance of the ROV from the ASV, was successfully tested both on Wednesday and on Thursday, April the 28th, when the ASV was deployed in the sea.

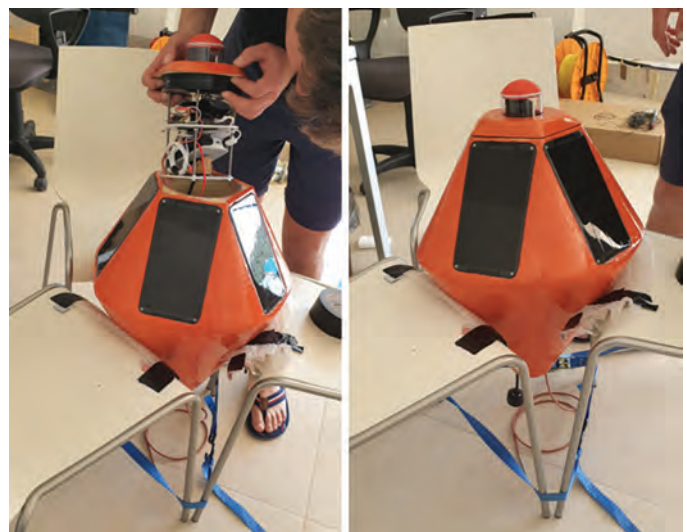
The other main demonstration was that of the newly developed surface unit for the Multifunctional Smart Buoys project. The field trials at Bistrina marked the first deployment of the



*Initial TMS-GNSS-UWGPS G2 integration performance tests while ASV Korkyra's hulls were being fixed on dry land on Wednesday, 27th of April 2022.*



*Successful performance tests of TMS-GNSS-UWGPS G2 integration performance tests at sea on Thursday, 28th of April.*



*The Smart Buoy being prepared for its first deployment in the bay.*

buoy unit, as well as another test for two previously deployed underwater acoustic sensor units.



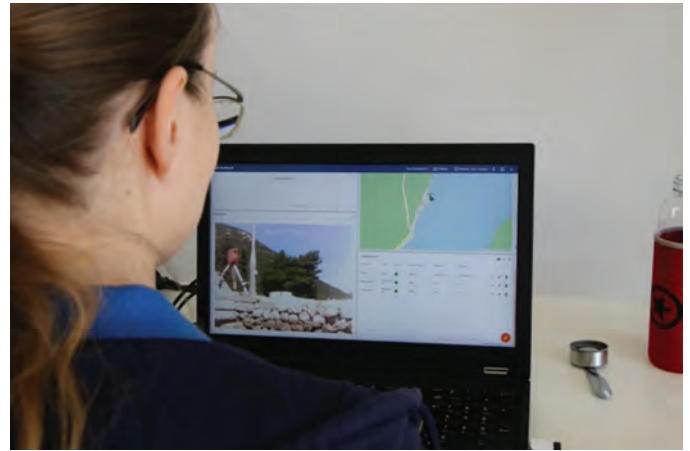


*Deploying the buoy.*

The units were deployed in the bay for 3 days total, with the sensor units gathering water quality data and sending it to the surface unit, while the surface unit collected temperature, GPS, and camera data, and relayed all of the acquired information to an online dashboard for user-friendly visualization.



*One of the sensor units and the buoy deployed in very shallow waters near a mussel farm.*



*Anja and Martin checking the data coming in from the newly deployed buoy and sensor units.*

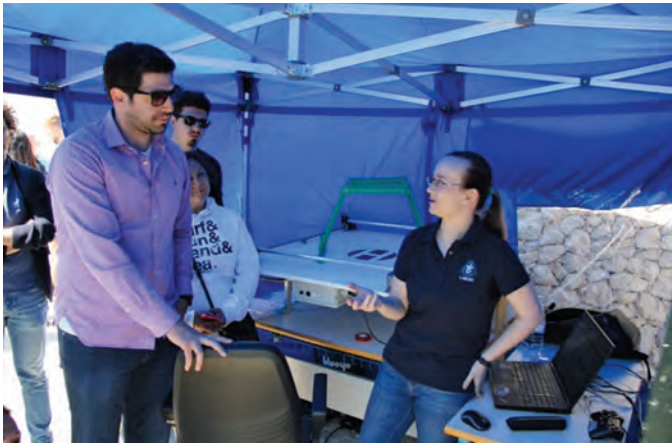
On the last day of our stay in Bistrina bay, Friday, 29th of April, we set up two nearby demo locations for our showcase. Autonomous buoys and sensor units were presented in front of the main building, while ASV Korkyra and its subsystems were showcased at the deployment location nearby. A large gazebo was set up to enable Anja and Nadir to show video streams and measurements from various subsystems on a large screen TV.



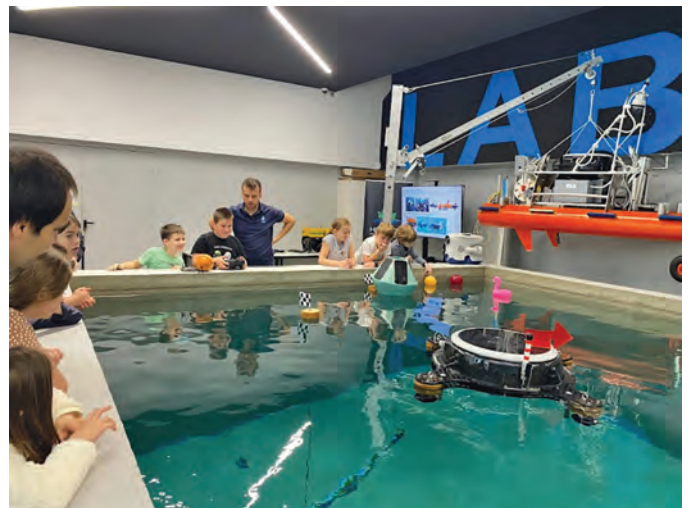
*Setup of the tent for demonstrating autonomous buoy's measurements and ASV Korkyra and Blueye Pro ROV video streams on a big screen TV.*







*Anja presenting the smart buoy and acoustic sensor unit system to interested visitors from various fields.*



*Nadir presenting the ASV Korkyra and Blueye Pro ROV developed for autonomous inspection missions in mariculture.*

*Vladimir Slošić and colleagues demonstrating underwater robots to the audience and holding a USV piloting course at LABUST laboratories in Zagreb.*

The attendees of the demo were very interested in all aspects of the equipment that was presented to them and wished to see these systems developed even further and hopefully even commercially available.

## Festival of Science, May 2022

After two years of online events, we finally welcomed another live edition of the Festival of Science in Croatia. The Festival of Science is a manifestation that has been continuously organized in Croatia since 2003 with the aim of bringing science closer to the public through informing about activities and results in the field of science, improving the public perception of scientists, and motivating young people to research and acquire new knowledge. We were all born curious; as small children we wonder why the sky is blue and the grass is green, and when we grow up we become productive members of society. The yearning for additional knowledge and the stimulation of inner curiosity at all ages is a worthy goal for which the Festival of Science stands. The organizers of the Festival are Universities of Split, Zagreb, Rijeka, Zadar and Osijek in cooperation with the Nikola Tesla Technical Museum and the British Council, under the high patronage of the Ministry of Science and Education.

As it was the case in previous years, the IEEE OES UNIZG student chapter and the Laboratory for Underwater Systems and Technologies were happy to participate in one of the 200 or so events at this year's Festival of Science with the theme—LIFE. As we all know, life on Earth began in water, and science and robots continue to make life easier and better every day. What is the connection between robots and water, what does the underwater world look like in virtual reality, and how robots can help fish and mussel farming were just some of the interesting topics participants could find out about at the Technical Museum Nikola Tesla. For those who were interested in how research robots were brought to life and how they became autonomous and wanted to try controlling underwater and surface robots, presentations were held at the LABUST laboratory at the Faculty of Electrical Engineering and Computing. Visitors of all ages got the chance of achieving a truly immersive experience and got a different perspective on life and science, because introducing science from a young age means in turn a better future for all of us.





*Luka Mandić and Igor Kvasić presenting underwater robotics to visitors at the Technical Museum Nikola Tesla in Zagreb.*

## The 13th International Agriculture Innovation Fair AgroArca, Prelog, Croatia, May 2022

Nadir Kapetanović and Kristijan Krčmar participated in the competition programme of the 13th International Agriculture Innovation Fair AgroArca. The fair took place in the small town of Prelog in Croatia, on 13–15th of May, 2022. It was organized by the Croatian Association of Innovators and the City of Prelog and gathered 130 exhibitors from 11 countries.

As a part of the HEKTOR project, they showcased the ASV Korkyra and its subsystems—the landing platform, the tether



*Fair stand with the ASV Korkyra and the ATMR ViV.*

management system, as well as the acoustic localization system and Blueye Pro ROV integrations. Our colleagues from LAR-ICS laboratory at the Faculty of Electrical Engineering and Computing University of Zagreb showcased their all-terrain mobile robot (ATMR) ViV that is developed for autonomous inspection and spraying in steep kartic vineyards.

ASV Korkyra won the Grand Prix, while ATMR won the Golden medal. On that occasion, President of the Croatian Association of Innovators, prof. dr. sc. Miljenko Šimpraga commented on the importance of innovations in agriculture and especially emphasized the development of innovations in cooperation with the academic community. A total of 16 gold, 18 silver and 21 bronze medals in the categories of young innovators and senior innovators were awarded at AGRO ARCA 2022.



*The awards were handed to prof. dr. sc. Zdenko Kovačić and Kristijan Krčmar.*

## Intelligent Autonomous Systems—IAS-17 Conference Zagreb, June 2022

17th international conference on Intelligent Autonomous Systems (IAS-17) was held in Zagreb from June 13th to June 16th, 2022. The conference was organized by Intelligent Autonomous Systems Society, Faculty of Electrical Engineering and Computing, KoREMA, ACROSS and DATACROSS. At the conference, our member, Vladimir Slošić, presented the paper



*Vladimir Slošić presented the paper at the IAS-17 conference.*



“Acoustical Underwater Localization of a Remotely Operated Vehicle in Mariculture” as one of the coauthors. At the beginning, project HEKTOR was presented and its main challenges, after that the integration of the catamaran Korkyra was explained and shown to the audience. At the end, results of the testing of acoustical underwater localization in the pool and at sea were presented and discussed. All the gathered data was made with the Waterlinked Underwater GPS system.

## Venice InnovaMare Trials, June 2022

As a part of the InnovaMare project, joint field trials between project partners were held in Venice on 20–22 June. Anja Babić and Martin Oreč participated in the experiments as representatives of LABUST, joined by researchers from the Consiglio Nazionale delle Ricerche (CNR) in Genoa and Venice.



*Testing area in the Venice Arsenal, Venice, Italy.*



*Buoy and SWAMP ready for deployment in the Arsenal of Venice.*



*SWAMP executing a trial mission in the Arsenal while the smart buoy monitors it.*

The vehicles communicated via Wi-Fi, with the buoy serving as a relay, sending collected data to an online IoT dashboard, providing real-time access to the status of the SWAMP catamaran as it went about an algae mapping mission.



*Approaching the remote testing area in the Venice Lagoon.*

Initial integration tests were performed in the historic Arsenal of Venice for the first two days of the trials, while the third day was reserved for more challenging deployment off the side of two boats near the abandoned island of Sant'Angelo della Polvere in the Venice Lagoon.



*Buoy and SWAMP deployed in the Lagoon of Venice.*



The trials were successful and served as an excellent logistics challenge, offering opportunities to test and practice buoy deployment, retrieval, and mooring options in a variety of conditions, as well as a stress test for the buoy.

### Internship Story by Allan Badian

In June our SBC got another member—Allan Badian from the Microelectronics & Automation department of engineering school Polytech Montpellier from Montpellier, France. He stayed with us for two months on an internship. Below is the story about his internship experience:

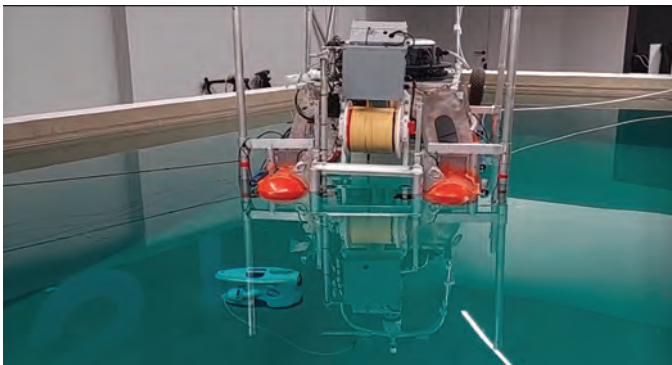
“To validate my 4th year of electrical & automation engineering studies, I carried out a 2-month internship at LABUST. It was my first experience with underwater robotics. I joined the team of Nadir Kapetanović to work on the Tether Management System (TMS) mounted on the autonomous surface vehicle (ASV) Korkyra developed in the scope of the HEKTOR project.



*Laboratory test room, LABUST FER—Zagreb.*

“I polished and refactored the code of the system, and also made a lot of tests in both computer simulation and pool tests with ASV and Blueye ROV in the laboratory. The TMS links the Blueye ROV to the ASV Korkyra and uses underwater acoustic localization (UWGPS) to track the ROV in order to wind/unwind the right amount of tether cable automatically.

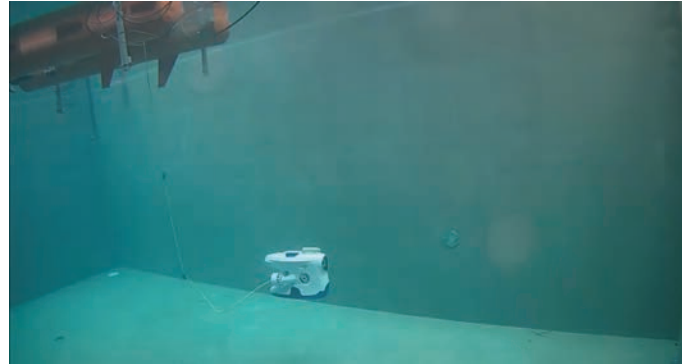
“The first challenge was to achieve an in-depth understanding of the way that the TMS operates. As I was going through refactoring steps, I discussed with Nadir about some new ideas



*Pool test of the Korkyra USV with the tether management system and Blueye ROV, LABUST FER—Zagreb.*

and features and a tracking method for the ROV in order to use the TMS motor less. It was really great to debate about what approaches were better to solve problems we had.

“The setup for the pool tests was a bit challenging because the acoustic localization is not as precise in an 8x4x3m pool (due to multipath issues) as in the open sea, but overall it worked quite well.



*Underwater picture of the pool test, LABUST FER—Zagreb.*

“During my time in Croatia, I also did a quick trip to Split. I spent time near Diocletian’s Palace, in the old town, and along the Riva promenade. I used one full day to join a group tour by boat to visit Komiža (island of Vis), Stiniva Cove, Budikovac and Town Hvar. Unfortunately, we couldn’t go to the famous Blue Cave because the waves were too big to enter safely.



*View from Spanish Fortress—Hvar Town.*

“Finally, I really enjoyed working with the LABUST team and the project was interesting. It was a great introduction to underwater robotics. I also deepen my experience in projects, programming using ROS, microcontrollers and developing software in Linux OS. It feels good to realize and apply what I learned at school. I would definitely come back to Croatia some day!”

### Conclusion and Future Plans

Finally, it was a busy but fruitful start of the year at the IEEE OES University of Zagreb Student Branch Chapter. All the hard

work finally got validated in pool and sea trials and experiment results got accepted or published in 10 conference and 3 journal papers this year. Beside presenting at the aforementioned IAS-17 conference, our members sent four of their publications to the upcoming 14th IFAC Conference on Control Applications in Marine Systems, Robotics and Vehicles (CAMS 2022) and five research papers to the OCEANS 2022 Hampton Roads conference, happening in October this year. Two papers got published in the April and May editions of the MDPI Sensors Journal, and another one got accepted for the Marine Technology Society (MTS) Journal.

In future plans, one of the biggest yearly events co-organized by our SBC, "Breaking the Surface 2022" workshop, is coming up from September 25th to October 2nd this year. As always, our members are preparing a dedicated social event night related to IEEE OES, many exciting demos and tutorials

during the week-long workshop and a novelty of this edition - the Acoustic Localization Challenge. Participants of the challenge will be asked to locate a hidden submerged pinger using nothing but passive acoustic receivers. Teams are going to be guided by world leading underwater acoustics experts through lectures and tutorials on the topic, and the team that obtains the most accurate estimate of the pinger's location will be awarded. More information about the whole event and registration options at [bts.fer.hr](https://bts.fer.hr).



### OTC Asia 2024

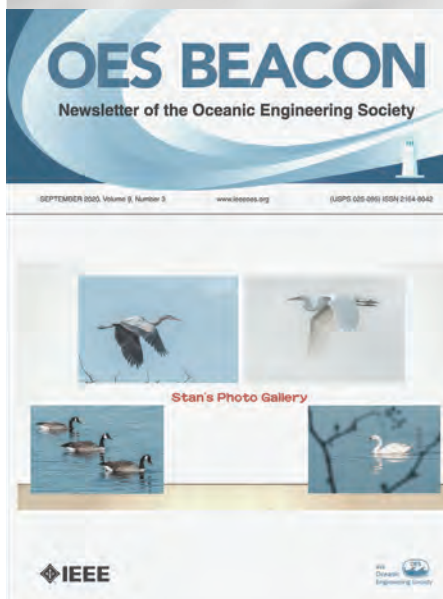
Offshore Technology Conference Asia

Dates: 2/27/2024–3/1/2024

Venue: Kuala Lumpur Convention Centre (KLCC), Kuala Lumpur, Malaysia







# IEEE OES PUBLICATIONS

## IEEE JOURNAL OF OCEANIC ENGINEERING

A quarterly journal published by the IEEE Oceanic Engineering Society.

<https://ieeaoes.org/publications/ieee-journal-of-oceanic-engineering/>

## OES BEACON NEWSLETTER

Provides articles on the latest society conferences, activities, members, etc., along with promotional information on upcoming OES events.

<https://ieeaoes.org/publications/oes-beacon/introduction-to-the-oes-beacon-newsletter/>

## IEEE EARTHZINE

Provides up-to-date information on science, technology, Earth/Ocean observation and information utilization and those participating and contributing to it's advancement.

<https://earthzine.org/>



# IEEE OES TECHNOLOGY COMMITTEES

STRIVE TOWARDS THE DEVELOPMENT OF VARIOUS OCEANIC ENGINEERING TECHNOLOGIES AND ITS APPLICATIONS TOWARDS THE BENEFIT OF HUMANITY.

- AUTONOMOUS MARITIME SYSTEMS (AMS)
- CURRENT, WAVE, TURBULENCE MEASUREMENT AND APPLICATIONS
- DATA ANALYTICS, INTEGRATION AND MODELING
- OCEAN OBSERVATION SYSTEMS AND ENVIRONMENTAL SUSTAINABILITY
- OCEAN REMOTE SENSING
- OCEAN SUSTAINABLE ENERGY SYSTEMS
- POLAR OCEANS
- STANDARDS
- SUBSEA OPTICS AND VISION
- UNDERWATER ACOUSTICS
- UNDERWATER CABLES AND CONNECTORS
- UNDERWATER COMMUNICATION, NAVIGATION AND POSITIONING



Visit <https://ieeeyes.org/technical-activities/technology-committees/> for details



- ARE YOU AN ENGINEER, SCIENTIST, EDUCATOR, TECHNICAL EXECUTIVE OR ORIGINATOR IN AN IEEE-DESIGNATED FIELD?
- HAVE YOU BEEN IN PROFESSIONAL PRACTICE FOR AT LEAST TEN YEARS?
- HAVE YOU SHOWN SIGNIFICANT PERFORMANCE OVER A PERIOD OF AT LEAST FIVE OF THOSE YEARS?

## APPLY FOR IEEE SENIOR MEMBERSHIP TODAY!

### Senior Membership Benefits

- Recognition for you
- Leadership eligibility
- Ability to refer other candidates membership.
- Review panel
- Letter of commendation
- Announcements
- Complimentary society voucher
- Senior Member plaque



# ATTENTION OES STUDENTS



## INTERNATIONAL STUDENT POSTER COMPETITION FREE TRAVEL TO A CONFERENCE PRIZE MONEY

[WWW.IEEEORG](http://WWW.IEEEORG)

IF YOU'RE AN OES STUDENT MEMBER, DON'T MISS OUT ON  
YOUR CHANCES TO ENTER THE STUDENT POSTER COMPETITION

HAVE YOU COMPLETED SOME EXCELLENT RESEARCH? BE SURE TO ENTER THE OES STUDENT POSTER COMPETITION. UP TO 25 INTERNATIONAL STUDENTS ARE CHOSEN TWICE A YEAR TO TRAVEL, ALL EXPENSES PAID, TO THE NEXT OCEANS CONFERENCE TO PRESENT THEIR RESEARCH IN THE POSTER SESSION. THE THREE TOP POSTERS RECEIVE **\$3,000, \$2,000 AND \$1,000** FOR 1<sup>ST</sup>, 2<sup>ND</sup> AND 3<sup>RD</sup> PLACE.





## IEEE OCEANIC ENGINEERING SOCIETY EX-OFFICIO ADMINISTRATIVE COMMITTEE

<b>Co-Editors-in-Chief, OES BEACON</b> HARUMI SUGIMATSU University of Tokyo ROBERT WERNLI First Centurion Enterprises	<b>Women in Engineering</b> FARHEEN FAUZIYA	<b>CHAPTER CHAIRS</b>	VANCOUVER Jacqueline Nichols	<b>REGION 10, ASIA &amp; PACIFIC</b>
<b>Earthzine Editor-in Chief</b> HARI VISHNU	<b>Young Professional</b> ROBERTO PETROCCIA	<b>REGION 1-6, USA</b>	VICTORIA Tom Dakin	AUSTRALIA Vacant
<b>Social Media</b> MANU LGNATIUS	<b>Technology Committee</b> <b>Coordinator</b> SHYAM MADHUSUDHANA	PROVIDENCE Gopu Potty	<b>REGION 8, EUROPE, MIDDLE EAST &amp; AFRICA</b>	DELHI Arun Kumar
<b>Webmaster</b> STEVE HOLT	<b>Joint OCEANS Advisory Board (JOAB)</b> BILL KIRKWOOD	HOUSTON In Chul Jang	FRANCE Philippe Courmontagne	HONG KONG Kim Fung Tsang
<b>Student Activities</b> ROBERTO PETROCCIA and FARHEEN FAUZIYA	<b>Awards, Nominations</b> JERRY C. CARROLL	SAN DIEGO Kevin Walsh	ITALY Maurizio Migliaccio	INDONESIA Marina Frederik
<b>Student Branch Chapter (SBC) Support Program</b> BRANDY ARMSTRONG	<b>IEEE USA R&amp;D Policy</b> JIM BARBERA	SEATTLE Gerald (Skip) Denny	NORWAY John Potter	JAPAN Masanao Shinohara
<b>Membership Development</b> RAJAT MISHRA	<b>Chapter Coordinator</b> GERARDO G. ACOSTA	HAWAII Mark Rognstad	PORTUGAL Anibal Matos	KOREA Son-Cheol Yu
<b>Fellow Evaluating Committee</b> N. ROSS CHAPMAN	<b>Professional Activities Committees for Engineers (PACE)</b> JIM COLLINS	<b>REGION 7, CANADA</b> CANADIAN ATLANTIC Mae L. Seto	SPAIN Joaquin del Rio Fernandez	MADRAS Sannasiraj SannasiAnnamalasiamy
		NEWFOUNDLAND & LABRADOR Eric W. Gill	RUSSIA Igor Shirokov	MALAYSIA Shahrieel Mohd Aras
		OTTAWA Yifeng Zhou	TUNISIA Habib Kammoun	NEW SOUTH WALES Kumbesan Sandrasegaran
		QUEBEC Georges Fournier	UKRI Radhakrishna Prabhu	SHANGHAI Lian Lian
		TORONTO Lian Zhao	<b>REGION 9, SOUTH AMERICA</b>	SINGAPORE Hari Vishnu
			ARGENTINA Gerardo Acosta	TAIWAN Fong C. Chiu

## TECHNOLOGY COMMITTEE CHAIRS

<b>AUTONOMOUS MARITIME SYSTEMS (AMS)</b> HANU SINGH	<b>DATA ANALYTICS, INTEGRATION AND MODELING</b> GOPU POTTY	<b>OCEAN REMOTE SENSING</b> FERDINANDO NUNZIATA	<b>STANDARDS STANDING</b> CHRISTOPH WALDMANN	<b>UNDERWATER CABLES AND CONNECTORS</b> M.A. ATMANAND
<b>CURRENT, WAVE AND TURBULENCE MEASUREMENT AND APPLICATIONS</b> HUGH ROARTY	<b>OCEAN OBSERVATION AND ENVIRONMENTAL SUSTAIN- ABILITY</b> JAY PEARLMAN	<b>OCEAN SUSTAINABLE ENERGY SYSTEMS</b> SEAMUS GARVEY	<b>SUBSEA OPTICS AND VISION</b> FRANK CAIMI	<b>UNDERWATER COMMUNICATION, NAVIGATION, AND POSITIONING</b> MILICA STOJANAVIC
		<b>POLAR OCEANS</b> ANDREAS MAROUCHOS	<b>UNDERWATER ACOUSTICS</b> KENNETH FOOTE	

## JOURNAL ASSOCIATE EDITORS

Filippo Arrichiello Kenichi Asakawa M.A. Atmanand Ralf Bachmayer Edmund F. Brekke Brad Buckham Li Chongyi Nicholas Chotiros Tory Cobb Brandon Cochenour Runmin Cong	Nuno Cruz Lee Culver Eric Delory Roe Diamant Brendan Englot Kenneth Foote Eric Gill Joao Gomes Merrick Haller Michael Hayes Wei He	Alan Hunter Drs. Guoyuan Li Toshihiro Maki Eliza Michaloupoulou Andrey Morozov Andrea Munafò Barbara Nicolas Costas Pelekanakis Vincenzo Piscopo John Potter Gopu Potty	Mike Richardson Roland Romeiser Tetjana Ross Torstein Sæbø Dick Simons Joao de Sousa Milica Stojanovic Ken Takagi Blair Thornton Harris Tsimenidis Andrea Trucco	Karl von Ellenrieder Kathleen Wage John Watson Wen Xu Fumin Zhang Peng Zhang Haiyong Zheng Rosa Zheng
---	--	---	--	--

## STUDENT BRANCH CHAPTER ADVISORS AND CHAIRS

<b>Escuela Superior Politécnica Del Litoral</b> Advisor: Altamirano Luis Chair: Aguirre-Rojas Karen Elizabeth.	<b>Strathclyde University</b> Advisor: Andrea Coraddu Chair: Olena Karpenko	<b>University of Florence</b> Advisor: Alessandro Ridolfi Chair: Alessandro Buccic
<b>Panimalar Institute of Technology—CHENNAI</b> Advisor: M Arun Chair: K P Adithya, R Vijayalakshmi	<b>University of Zagreb</b> Advisor: Nikola Miskovic Chair: Anja Babić	<b>National Engineering School of Sfax</b> Advisor: Habib Kammoun Chair: N/A
<b>Shanghai Jiao Tong University</b> Advisor: Lian Lian Chair: Daiwei Li	<b>Western Washington University</b> Advisor: Lund John A Chair: Kintzele James Lee	<b>Pontificia Universidad Catolica de Chile</b> Advisor: Giancarlo Troni Chair: Fernanda Lecaros Saavedra
<b>The University of Southern Mississippi</b> Advisor: Mustafa Kemal Cambazoglu Chair: Laura Hode	<b>Indian Institute of Technology Delhi (IITD)</b> Advisor: Monika Aggarwal Chair: Puja Dube	<b>Sri Sai Ram Engineering College</b> Advisor: Dr.Bhagavathi S Chair: Kharthick Rham M

# OCEANS 2023 Limerick

CONFERENCE & EXPOSITION

5 – 8 June, 2023  
Limerick, Ireland

Blue Ocean Planet Earth



IEEE Oceanic  
Engineering Society

## Start planning your next OCEANS!

Save the dates for **OCEANS 2023, June 5-8** and join us in Limerick, Ireland.

The OCEANS conference is the flagship event of the IEEE Oceanic Engineering Society (OES) and the Marine Technology Society (MTS). The event is recognized as the premier forum for the international marine community to meet and discuss technical innovations and current trends in the marine technology sector. OCEANS brings together engineers, industry practitioners, government officials, public-sector executives, researchers and academics from all aspects of the oceanic spectrum.

**OCEANS 2023** will be hosted at the beautiful University of Limerick campus, located on the outskirts of Limerick City. It is the first time that OCEANS will be held in Ireland. The event will feature all aspects of oceanic engineering, science and technology. The conference theme is "**Blue Ocean Planet Earth**".



Contact us

[limerick23.oceansconference.org](http://limerick23.oceansconference.org)