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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.

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Member Benefits—Did You Know?

Connect Virtually with Google Hangouts Meet

From the 30 April IEEE Membership Bulletin - Google Hangouts Meet is a business web conferencing solution from Google that is available to any IEEE member. During this time, when in-person meetings are being canceled, your digital presence is so important. Your membership benefits have more value now than ever through helping you connect with customers, find new business, and prepare to charge forward when this crisis is over. Google Hangouts Meet comes with the ieee.org email account. While it normally supports up to 100 participants, Google has increased this capacity to 250 until 1 July 2020. To take the most advantage of Google Hangouts Meet, members must use their ieee.org Google account to sign in.

Visit the IEEE.ORG website and search for Google Meet or use the following link:

https://entrepreneurship.ieee.org/2020_03_27_member-benefit-google-hangouts/

From the OES BEACON Editors

Harumi Sugimatsu and Robert Wernli

Welcome to the June 2020 issue of the Beacon. As you can see in the photos, your Beacon editors are following proper COVID-19 safety procedures. For your own safety, please follow appropriate safe distance guidelines and do not read this issue of the Beacon within 6 feet of anyone. (Just kidding). Also, as you'll see in our photo salute, we've tried to keep a smile in these troubled times by changing from our usual "Blast from the Past" to a "Toast to the Future." There are good times ahead for all of us. Keep smiling.

In all seriousness, this pandemic has caused considerable problems for our society and its members. As indicated throughout this issue many workshops and symposia have been cancelled or postponed along with the OCEANS 2020 Singapore and OCEANS 2020 Gulf Coast conferences. On the positive side, there appears to be many opportunities for some of our events to be held in a "virtual" atmosphere. Please refer to our website to find the latest on our society events.

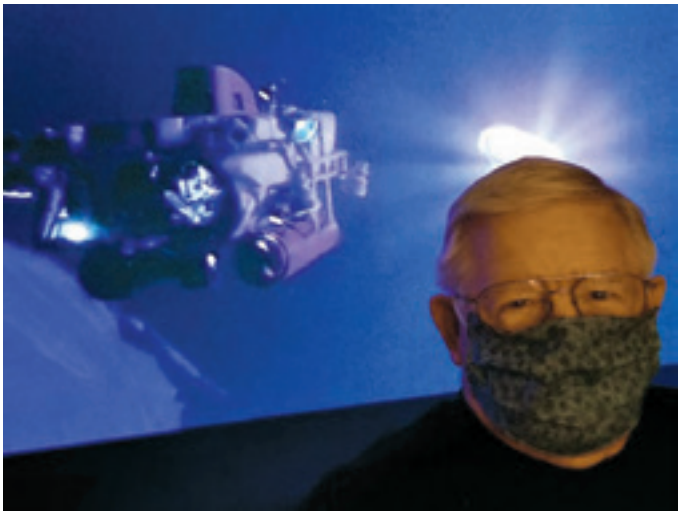
An important note is that our AdCom elections are here for the 2021-2023 team. Voting deadline is 1 July. You should have received the list of candidates and election materials via email, however, we are also including all information on the 12 candidates in this issue. A good note is that there were 21 nominees for the 12 election candidate positions. And a great aspect of these applicants are their wide international range and many are some of our younger professional members. Be sure to read their vision of the future in their candidate statements.

The Journal EIC again provides recently released papers that are available to our members and our VP for Technical Activities provides the latest on our technical committee activities. We also have a call for Distinguished Lecturers (DLs). Our VP for Workshops and Symposia provides an update to upcoming events, most of which have been postponed or cancelled. An excellent overview of the latest Oceans Best Practices Workshop is also included.

There is plenty going on in our chapters as reported in the articles from the Victoria, Malaysia and Japan chapters and also from Japan's award winning "Team Clairvoyance."

We also take pride in our members. Be sure to see the latest articles including "Who's Who in the OES," latest from some of our Young Professionals, and a report from our Student Activities chair. We also have the latest report from First Flight High School's phytoplankton program that OES supports financially.

Your Beacon editors ensure this issue is safe to read. Harumi in the ocean.



Bob in a movie! Can you guess which one??

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.

VPTA Column: Celebrating the Maturity of Technology Committees

Malcolm Heron, OES Vice President for Technical Activities

Malcolm Heron

The Technology Committees Coordinator, Shyam Madhusudhana, has been busy raising the visibility of the TCs inside OES and in the community more generally. The TCs are at the very foundation of the Society and feed into many aspects of OES. It is instructive to go back to the constitution to see that the Purpose is: *The Society shall promote close cooperation and exchange of technical information among its members through publications and meetings. The Society shall foster the technical and professional growth of its members.*

There are twelve TCs and about half of them are running workshops or symposia, and we have recently been seeing more reports of these activities in the Beacon. We have now engaged the Singapore Chapter, under the capable control of Bharath Kalyan, to provide a template web page for each Technology Committee. This is a win-win for OES because the TCs get their web pages and the Singapore Chapter gets a reasonable reward. The idea is that OES members will be able to go to the TC web page at <ieeeoes.org/technical-activities/technology-committees>, scroll down to your favourite TC and click a link to the web page for that TC to see the complete palette of their activities. Bharath is iterating the new TC pages through the respective chairs but by the time this issue of Beacon comes out the Autonomous Maritime Systems, Polar Oceans, Underwater Communication, Navigation and Positioning, and Standards should be close to having links to their web pages; and others will be following closely in their wake.

The TCs are carrying out their activities with financial support through the TC Activities Funding Scheme, but they do not have structured rosters of membership. This causes extra work for the TC Chairs because they have to create and maintain their own lists of members. We are addressing that by listing the TCs as "products" in the *IEEE Memberships and Subscriptions Catalog under Technical Committees*. Some other Societies have already done this. Members can then find and "purchase" them for $0 at the time of membership renewal (i.e., FREE), and this will be added to their membership record in the IEEE system. Note that this is completely voluntary and the choice of TCs is yours. I urge you to go to the Catalog and have a look sometime before you renew your membership later in the year.

There have been some quite big changes in the TCs over the last couple of years and now the creation of specific TC web pages, and an identified and active membership for each TC, marks a maturity where the TCs are taking their rightful place serving the PURPOSE of the Society.

And by the way: you can sign up for more than one of the following TCs if you wish.

The current OES Technology Committees are:

- Autonomous Maritime Systems TC (AMS)
- Current, Wave, Turbulence Measurement and Applications TC (CWTMA)
- Data Analytics, Integration and Modeling TC (DAIM)
- Ocean Observation Systems and Environmental Sustainability TC (OOSES)
- Ocean Remote Sensing TC (ORS)
- Ocean Sustainable Energy Systems (OSES)
- Polar Oceans TC (PO)
- Standards TC (STD)
- Subsea Optics and Vision TC (SOV)
- Underwater Acoustics TC (UA)
- Underwater Cables and Connectors TC (UCC)
- Underwater Communication, Navigation and Positioning TC (UCNP)

Call for OES Distinguished Lecturers Nominations for 2021–2023 Close July 31, 2020

Malcolm Heron, OES Vice President for Technical Activities

The IEEE Oceanic Engineering Society (OES) invites nominations for OES Distinguished Lecturers. The IEEE OES Distinguished Lecturers Program provides high quality speakers to the Oceanic Engineering Community, especially, OES Chapters, Student Branch Chapters, and Student Clubs. Appointment as an OES Distinguished Lecturer is a major Society recognition. The selected Distinguished Lecturers will be approved by the OES AdCom at their September Equinox Meeting, to commence on 1 January of the following year.

Nominations

Distinguished Lecturers will have

- high technical proficiency in their area;
- demonstrated ability to make technical presentations that are inspiring to audiences of experts, as well as to general audiences;
- OES membership throughout the term of their appointment.

The DL nominee must be nominated by an OES member who does not have conflict with the selection process. Self-nominations are not accepted. If you are looking for a nominator we encourage you to contact the chair of the most relevant OES Technology Committee. Nominations for a four-year term 2021–2024 close on 31 July 2020 with the Vice-President for Technical Activities. A nomination email should include a brief CV (1 page) of the nominee, contact details for the nominee, the nominator and endorsement by the relevant Technology Committee Chair..

The Distinguished Lecturer Committee will consider nominations, taking into account the diversity of topics and geographic spread of the pool of Distinguished Lecturers, as well as the criteria given above.

Duties

The Distinguished Lecturers will start their three-year term in January. Each Lecturer should submit topics in his/her field of expertise that will be posted on the Society Website. The Distinguished Lectures should be readily available to travel within their geographical area upon contact by the Chapters or appropriate organizations, and will be expected to add small diversions to international travel to present lectures as opportunities arise. Reasonable travel expenses will be paid by the Distinguished Lecturers Program.

New DLs from 2020 to 2023

Malcolm Heron, OES Vice President for Technical Activities

We have three new DLs from 2020 to 2023.

Donna M. Kocak
John R. Potter
Tamaki Ura

Their bios and topics of our excellent DLs follows. You can see their information on the OES website too.

Donna M. Kocak

L3Harris Technologies, Melbourne, Florida, U.S.A.

Topics

1) Perspectives in Ocean Engineering
2) Fiber optic cables and systems
3) Hazard monitoring by electro-optic methods

Biography

Donna Kocak has had an outstanding career in defense and scientific projects developing and applying solutions in subsea optics, imaging and robotics. She graduated with an M.Sc in Computer Science in 1997 from the University of Central Florida; an MBA in 2008 from the University of Florida; and M.Sc in Industrial Engineering in 2011 from the University of Central Florida. She is currently a Senior Scientist, Advanced Concepts Engineering, and Fellow at the Harris Corporation in Melbourne, Florida, where she has developed novel optical imaging and communication solutions for under-sea defence and scientific projects. Prior to 2008 Donna Kocak was Founder and President of Green Sky Imaging, LLC (GSI) who developed laser/video photogrammetry software for underwater inspection and survey. Her earlier career positions were with Naval Training Systems Center, Florida; Harbor Branch Oceanographic Institution, Florida; eMerge Interactive; and the Advanced Technologies Group in Florida.

Donna M. Kocak

Her raft of Honors and Awards validate her reputation as a leader in her profession with a clear ability to develop innovation seeding projects and new maritime business. She has been invited to speak to a wide range of audiences from school groups to defense think-tanks, on topics from undersea optics technologies to over-views of ocean engineering.

She has over 75 publications which follow a development of her interests from technology topics earlier to more recent papers on the state of technology and the future demands in subsea optics.

Honors and Professional Engagements:

L3Harris Technical Fellow, 2020

HARRIS Building a Legacy Award for demonstrating pride and accountability by developing next generation of talent through leadership and mentoring (2018)

Elected President of the Marine Technology Society (MTS), 2017–2018

Invited USA Science & Engineering Nifty Fifty Speaker, 2015–2016

SWE Space Coast Outstanding Woman Engineer Award, 2012

Appointed to FL Tech OE & UCF EECS Industry Advisory Boards, 2011

Delegated Senior Member of IEEE Oceanic Engineering Society, 2010

HARRIS Golden Quill (2009, 2016) and Industry Recognition (2012) Awards

Founded/Appointed Chair of the MTS Ocean Observing Systems Committee (2008–2015); & Chair of Underwater Imaging Committee (2004–2008)

Appointed to MTS Journal Editorial Board (2008–Present); MTSJ Guest Editor of 10 special issues including 4 State of Technology volumes (2008–2019)

Member of NDIA, MTS, IEEE/OES, SWE and Upsilon Phi Epsilon Honor Society

John R. Potter

Norwegian University of Science and Technology
Trondheim, Norway

Topics

1) The next wave of game-changing heterogeneous nested autonomy
2) Underwater Acoustics, communication and networking
3) Ocean noise and marine mammals
4) Lessons learnt in the open ocean, a blue-water sailing perspective

Biography

John Potter has a Joint Honours degree in Mathematics and Physics from Bristol University in the UK and a PhD in Glaciology and Oceanography from the University of Cambridge on research in the Antarctic, for which he was awarded the Polar Medal in 1988. John has worked on polar oceanography, underwater acoustics, ambient noise (including imaging), marine mammals, communications, IoUT, autonomous vehicles and strategic development. He has 40 years' international experience working at the British Antarctic Survey in the UK, NATO in Italy, SIO in California, NUS in Singapore and most recently at NTNU in Norway. John is a Fellow of the IEEE and MTS, an Associate Editor for the IEEE Journal of Oceanic Engineering, IEEE OES Distinguished Lecturer, PADI Master Scuba Diver Trainer & an International Fellow of the Explorer's Club.

John is a 'big-picture' visionary academic professional with experience encompassing strategic business development and award-winning research, including a National Defence Technology Prize in 2006 and the NATO Scientific Achievement Award in 2018. He has a proven track record of establishing research facilities that exemplify standards of excellence, having founded the Acoustic Research Laboratory and co-founded the Tropical Marine Science Institute in Singapore, and is a recognised educational leader with coaching, facilitating and training experience. He is an effective verbal/written communicator, experienced in managing change, building new opportunities, advocating for universities/organisations and interfacing with multi-national governmental, academic, military, and industrial organisations, as demonstrated by his pioneering leadership to establish the first digital underwater communications standard, 'JANUS'. He is extensively internationally published, with over 2,500 citations. John has also sailed with his family across the Atlantic, Pacific and Indian Oceans, clocking 50,000+ nautical miles of blue-water cruising over a period of 30 years in pursuit of environmental awareness and marine conservation.

Among his achievements are:

- Pioneering work on the impact of climate change on the Antarctic, for which he was awarded the Polar Medal by H.M. Queen Elizabeth II, with his publications from the 80s still being cited today.
- Leading the project that developed the first Ambient Noise Imaging system (ADONIS), producing passive acoustic video images of silent objects in real time, for which he received an ASA award for best paper.
- Expedition leader for a 10,000 n.m. circumnavigation of the Indian Ocean by sailboat in support of education, public outreach and marine research, leading to publication of the first measurements of persistent organic pollutants in the Indian Ocean in 30 years.
- Leading the project that built the first 2-D digital Ambient Noise Imaging array (ROMANIS), resulting in a National Defence Technology Prize.
- Leading the team that developed the first digital underwater communications standard 'JANUS', now adopted by 28 nations and which resulted in the NATO Scientific Achievement Award
- Conceived and wrote the draft Letter of Intent, now adopted as a formal memorandum, signed in October 2018 by Defence Ministers of 13 NATO nations, to collaborate on Maritime Unmanned Systems.
- Founder of the Acoustic Research Laboratory (ARL) in Singapore
- Educational leader and award-winning instructor/trainer with a history of improving instruction methods including use of new technologies and nurturing innovation through experiential learning.

The following selected publications illustrate his diverse experience:

1) Gordon, J., Gillespie, D., Potter, J.R., Frantzis, A, Simmonds, M.P., Swift, R., et. al. (2003) A review of the effects

of seismic surveys on marine mammals. *Marine Technology Society Journal, 37, (4),* 16-34. (332 citations)
2) Chitre, M., Potter, J.R., Ong, S.H., (2006) Underwater Acoustic Signal Processing-Optimal and Near-Optimal Signal Detection in Snapping Shrimp Dominated Ambient Noise. *IEEE Journal of Oceanic Engineering* 31 (2), 497-503. (161 citations)
3) Potter, J.R., Paren, J.G. (1985) Interaction between ice shelf and ocean in George VI Sound, *Antarctica. Oceanology of the Antarctic Continental Shelf* 43, 35-58. (108 citations)
4) Potter, J.R., Mellinger, D.K., Clark, C.W. (1994) Marine mammal call discrimination using artificial neural networks. *The Journal of the Acoustical Society of America 96 (3)*, 1255-1262. (95 citations)
5) Petrioli, C., Petroccia, R., Potter, J.R., Spaccini, D. (2015) The SUNSET framework for simulation, emulation and at-sea testing of underwater wireless sensor networks. *Ad Hoc Networks, 34,* 224-238. (82 citations)
6) Potter, J.R., Alves, J., Green, D., Zappa, G., Nissen, I., McCoy K. (2014) The JANUS underwater communications standard. *Underwater Communications and Networking* (80 citations)
7) Epifanio, C.L., Potter, J.R., Deane, G.B., Readhead, M.L., Buckingham, M.J. (1999) Imaging in the ocean with ambient noise: the ORB experiments. *The Journal of the Acoustical Society of America 106 (6)*, 3211-3225. (66 citations)
8) Petrioli, C., Petroccia, R., Potter, J.R. (2011) Performance evaluation of underwater mac protocols: From simulation to at-sea testing. *IEE/MTS OCEANS 2011 Spain*, 1-10. (56 citations)
9) Wurl, O., Potter, J.R., Obbard, J.P., Durville, C. (2006) Persistent organic pollutants in the equitorial atmosphere over the open Indian Ocean, *Environmental Science and Technology*, 40(5) 1454-1461 (53 citations)
10) Potter, J.R. (1994) Acoustic imaging using ambient noise: Some theory and simulation results. *Journal of the Acoustical Society of America 95(1) 21-33.* (47 citations)

Tamaki Ura

President of Deep-Ocean Ridge Tech Co., Ltd.
Professor Emeritus of University of Tokyo, Japan

Topics

1) Autonomous Underwater Vehicles Perspective
2) Deep Sea Exploration
3) Underwater Technologies

Biography

Tamaki Ura is Professor Emeritus of the University of Tokyo, where he is a world leader in the development of Autonomous Underwater Vehicles.

He has developed various types of Autonomous Underwater Vehicles (AUVs) and related application technologies including navigation methods, a new sensing method using a chemical sensor, precise seafloor mapping methods, a precise seabed positioning system with a resolution of a few centimeters, a new sensing system of the thickness of cobalt-rich crust; and more. He has shown, by using these technologies that AUVs are practicable and valuable tools for deep-sea exploration.

Professor Ura has dedicated himself to the activities of international societies by establishing IEEE/OES Japan Chapter, where he served as its first chair from 1995 to 2000. He organized the International Symposium on Underwater Technology: UT'98, UT2000, UT'02, UT'07, UT'11, UT'13 in Tokyo and UT'04, UT'19 in Taipei, UT'09 in Wuxi, UT'17 in Busan and UT'15 in Chennai under the IEEE/OES Japan Chapter, and realized the international symposium on OCEANS/Techno-Ocean 2004, Kobe in November 2004. This was the first OCEANS conference held in Asia.

He has contributed on ocean related themes not only for the academic audiences but also for the public. He worked as a Cabinet Councillor for The Headquarters of Ocean Policy of Japanese Government from 2007 to 2018. He was a Commissioned Judge of the High Marine Accidents Inquiry Agency from 1984 to 2008, and he was the chairman of the Ocean Technology Committee of the Society of Naval Architects of Japan from 1998 to 2000.

After retiring from the University of Tokyo, he has been engaged in R&D of field robots such as beach cleaning robots and tomato collection robots. In addition, he organized a team which investigated the sunken ship, and discovered 27 submarines such as I-47, I-58 of Imperial Japanese Navy and U-boat U-511(Ro-500), and the passenger ship "Taiyo Maru".

Based on these activities, he has received many awards;

2019: Distinguished service award (Robotics and Mechatronics Division) from the Japan Society of Mechanical Engineers (Japan)
2016: The Fujisankei Communications Group Award of the 25th Grand Prize for the Global Environment Awards from Fujisankei Communications Group (Japan)
2013: Technical Achievement award (Robotics and Mechatronics Division) from the Japan Society of Mechanical Engineers (Japan)
2012: AUV "TUNA SAND" was awarded the 5th Robot Award from METI (Japan)
2010: IEEE Oceanic Engineering Society Distinguished Technical Achievement Award
2007: Nominated as IEEE Fellow, for contributions to autonomous underwater vehicle technologies.
2006: Distinguished Service Award from IEEE/OES Japan Chapter (Japan)
2000: Award from Agency for Science and Technology (Japan)
1999: Award from the Japan Society of Mechanical Engineers (Japan)
1998: Award from High Automation Technology Association (Japan)
1995 and 1997: Awards on Invention from the Society of Naval Architects of Japan (Japan)
1982: Houkou Award on the significant contributions to safety of moored ship (Japan)
1979: Award from the Society of Naval Architects of Japan (Japan)

From the Vice President for W&S—A COVID-19 Update

Philippe Courmontagne, Vice President for W&S

For 2020 and 2021, IEEE OES is involved in several upcoming events as a co-sponsor. But this year is really a particular one, as the general chairs of these events have to manage with the coronavirus COVID 19 pandemic. For this reason, and since my last article in the previous Beacon, some changes have appeared. It is really difficult to ensure these changes will be definitive, so please visit the OES website for the latest on any possible date, format or location changes to these events.

Marine Debris: a UN perspective—End of May, 2020, Cascais, Portugal

Following the success of the workshop "Marine Debris Indicators: What's Next?", IEEE OES will be one of the organisers of a new workshop concerned with maritime pollution.

Ucomms—September 1–3 2020, Lerici, Italy POSTPONED to September 2021

The mission of the UComms conference series is to promote the development of a deep understanding of the propagation of communication signals underwater and the performance of higher layer protocols with the objective of supporting the intelligent choice of network-wide standards, as a foundation for interoperability.

UComms '20 is the fifth conference of the series organised by the NATO Centre for Maritime Research and Experimentation (CMRE) and is open to scientists and engineers involved in research, development, implementation and use of underwater communication systems.

The conference topics covers the full range of interests from physical understanding of the communication channels (acoustic optical, radio) through to network protocols and experimentation.

Visit http://www.ucomms.net/ !

Autonomous Underwater Vehicle Symposium (AUV)—September 30–October 2, 2020, St John's, Canada

From a face-to-face event to a face-to-computer one

Every two years the IEEE Oceanic Engineering Society (IEEE OES) sponsors a collaborative symposium to bring together those working in the field of autonomous underwater vehicles.

This symposium will cover topics from vehicles to extreme environments, exploring software development; multi-vehicle; mission planning; navigation, localization and control; applications (mapping, oceanography …).

Due to concerns around COVID-19 and resulting travel restrictions, all AUV2020 sessions will be held remotely. The symposium will include recorded and real-time events to accommodate attendees in different time zones.

The abstract submission deadline has been extended to May 30. Registration fees will be discounted, and a new pricing structure will be proposed.

All you have to know can be found here: http://auv2020.org/

GEO Blue Planet Symposium—October 28–30, 2020, Port Elizabeth, South Africa

While writing this article, we had received no information concerning any changes to this event

This 5th GEO Blue Planet Symposium will be co-organized by SAEON (South African Environmental Observation Network), and CSIR (Council for Scientific and Industrial Research) and the ACCESS programme (Alliance for Collaboration on Climate & Earth Systems Science). SAEON is well known for its work in the international ocean community for its contributions to ocean and coastal research and as an international participant with the JCOMM, the UNESCO/WMO Joint Commission on Oceans and Meteorology. The CSIR, is a world-class African research and development organisation and undertakes directed, multidisciplinary research and technological innovation that contributes to the improved quality of life of South Africans. The ACCESS programme is an earth systems science research consortium in South Africa representing several academic and research agencies and has a significant capacity building sub-programme.

More information will be available at the symposium's webpage: https://symposium.geoblueplanet.org/

IEEE USYS—December 14–15, 2020, Malaysia

While writing this article, we had received no information concerning any changes to this event

For its 9th edition, this International conference on Underwater System Technology: Theory and Applications will be held in Malaysia during December 2020.

This conference aims to provide a platform for researchers, scientists, engineers, academicians, as well as industrial professionals from all over the world to share, discuss and disseminate their current R & D activities and experiences related to the field of underwater system technology, including relevant theories as well as applications.

USYS 2020 focuses on exploring new technology and approach to utilizing the vast resources of the oceans, 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.

Deadline for abstract submission: July 30, 2020

Website: http://oes.ieeemy.org/about-us/ieee-usys-2020/

International Symposium on Underwater Technology 2021 (UT21)—March 1–4, 2021, Tokyo, Japan

UT21, as a face-to-face event in Tokyo, is postponed to 2023 and will become UT23, UT21 will become an Online event.

The University of Tokyo is delighted to welcome international experts for the International Symposium on Underwater Technology (UT21). One of the most pleasant months in Japan will host the highly successful symposium, which is organized by the IEEE OES, IEEE OES Japan Chapter, the University of Tokyo's Institute of Industrial Science (IIS), and Earthquake Research Institute (ERI). The symposium 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.

The symposium consists of keynote talks, double-track technical sessions, a student poster session and a technical tour on the first day. It will feature advanced underwater technology and scientific use of submarine cables & related technologies. Suggested topics are Environmental Monitoring, Marine Robotics, Renewable Energy, Sensors, Acoustics and Communications, Observatory and Disaster Mitigation …

The important dates are:

- Abstract submission date: September 18, 2020
- Notification of acceptance date: October 16, 2020
- Full paper submission date: December 11, 2020
- Conference Dates: Mars 1–4, 2021.

Online Event – Details will be announced soon

Do not miss the opportunity to participate to this great event by visiting: http://www.ut2021.org/

IEEE/OES China Ocean Acoustics Symposium (COA 2020), Harbin, China—POSTPONED

COA 2020 is the second edition of the COA's series. This event, sponsored by the IEEE Oceanic Engineering Society, has a goal to create in China an exchange platform for universities, research institutions and industries worldwide in one of the key fields of ocean science and engineering.

The aim is to create opportunities for high-level joint research in specific areas of common interest by facilitating the sharing of research achievements, experiences and new ideas on hot topics. By actively participating in the symposium, postgraduate students and young researchers will have the opportunity to challenge their ideas, new approaches and developments of techniques and technologies. The organizers will invite widely recognized professors and experts to give tutorials and talks on underwater acoustics fundamentals, new approaches and cutting-edge applications.

Due to the Coronavirus, this Event has been Postponed to 2021 and will be Held in Harbin from July 14 to July 17, 2021.

The new important dates are:

- Abstract submission date: March 20, 2021
- Conference Dates: July 14–17, 2021.

All you have to know: www.meetlist.org/COA2020/

Do not forget IEEE OES exists to serve you, but only your participation in events can allow the society to fulfill its mission!

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:

- S. Ravikumar; Anandanarayanan R; A. George; B. Pattanaik; P. Vinayak Dudhgaonkar; P. Jalihal; A. Samad, "Experimental Investigation of a Bidirectional Impulse Turbine for Oscillating Flows at Various Resistive Loads".
- A. Das, "Real-Valued Sparse Bayesian Learning for Off-Grid Direction-of-Arrival (DOA) Estimation in Ocean Acoustics".
- M. Al-Ani; M. Belmont, "On Fully Describing the Probability Distribution of Quiescent Periods From Sea Spectral Density".
- Y. Zhou; F. Tong; A. Song; R. Diamant, "Exploiting Spatial-Temporal Joint Sparsity for Underwater Acoustic Multiple-Input-Multiple-Output Communications".
- J. Sun; S. Liu; F. Zhang; A. Song; J. Yu; A. Zhang, "A Kriged Compressive Sensing Approach to Reconstruct Acoustic Fields From Measurements Collected by Underwater Vehicles".
- D. Sun; X. Li; Z. Cao; J. Yong; D. Zhang; J. Zhuang, "Acoustic Robust Velocity Measurement Algorithm Based on Variational Bayes Adaptive Kalman Filter".
- B.P. Driscol; L.A. Gish; R.G. Coe, "A Scoping Study to Determine the Location-Specific WEC Threshold Size for Wave-Powered AUV Recharging".
- P. Casari; F. Campagnaro; E. Dubrovinskaya; R. Francescon; A. Dagan; S. Dahan; M. Zorzi, R. Diamant, "ASUNA: A Topology Data Set for Underwater Network Emulation".
- P. Stinco; A. Tesei; G. Ferri; S. Biagini; M. Micheli; B. Garau; K.D. LePage; L. Troiano; A. Grati; P. Guerrini, "Passive Acoustic Signal Processing at Low Frequency with a 3-D Acoustic Vector Sensor Hosted on a Buoyancy Glider".
- Y. Noguchi; T. Maki, "Tracking Omnidirectional Surfaces Using a Low-Cost Autonomous Underwater Vehicle".
- I.V. Florinsky; S.V. Filippov, "Three-Dimensional Geomorphometric Modeling of the Arctic Ocean Submarine Topography: A Low-Resolution Desktop Application".
- B. Thomas; A. Hunter; S. Dugelay, "Phase Wrap Error Correction by Random Sample Consensus With Application to Synthetic Aperture Sonar Micronavigation".
- R.H. Rogne; T.H. Bryne; T.I. Fossen; T.A. Johansen, "On the Usage of Low-Cost MEMS Sensors, Strapdown Inertial Navigation; and Nonlinear Estimation Techniques in Dynamic Positioning".
- L.J. Wong; B. Kalyan; M. Chitre; H. Vishnu, "Acoustic Assessment of Polymetallic Nodule Abundance Using Sidescan Sonar and Altimeter".

Finding Connectedness Through the OES

Jeff Dusek, Student Activities Chair

Jeff Dusek, Assistant Professor of Mechanical Engineering at the Franklin W. Olin College of Engineering in Needham, Ma.

When I learned I had the opportunity to serve as the Oceanic Engineering Society Student Activities Chair in early February, I had a great plan lined up to connect with students at OCEANS Singapore, learn more about ongoing activities throughout the summer, and begin to put ideas in place with an eye towards OCEANS Biloxi. Well, as we all know, the spring has looked a little bit different than planned! When Olin College of Engineering shifted to fully online instruction in mid-March, my spring became a scramble to support remote instruction of a project-based curriculum, combined with a seemingly endless series of Zoom calls. Probably like many of you, I struggled to adapt to online teaching, missing the spontaneous learning opportunities that happen in the classroom and laboratory when working with undergraduate students. Despite these challenges, we made it through the semester, and here I am with some time to reflect on the things that OES does extremely well when connecting with students, and areas where we can aspire to do better.

When I speak with students, faculty, and staff at Olin during this period of disruption, the number one comment I hear is that they all miss the feeling of connectedness that comes with being part of our community. I think this applies well beyond our campus, and is one of the aspects that has made this pandemic so challenging for us all. When it comes to my role as the Student Activities Chair (SAC) for the OES, I see creating opportunities for connectedness between students, as well as between students and the broader society,

Spring 2020 has demonstrated the value of connectedness, in the classroom, in the lab, and through the OES.

Jeff (far right) hiking with fellow SPC participants following the OCEANS 2014-Taipei conference.

to be my primary role. This has always been true, but COVID-19 has shown us just how important community, shared knowledge, and cross-disciplinary cooperation truly are.

The OES has done an excellent job over the past several years of enhancing access through sponsored student memberships, increasing awareness through social media use, and providing direct monetary support for student chapters. While these efforts have created an excellent foundation for growth, I believe more can be done to create developmental opportunities for students. In particular, I would like to take a fresh look at the student programming at the OCEANS conferences, with a focus on undergraduate and secondary school students.

Existing programs at the OCEANS conferences already provide foundations for student connection, with the highlights being the Student Poster Competition (SPC) and the student mixer. I believe we can build on these successful programs to increase scaffolding intentionally designed to support students throughout the conference experience. I have a strong fondness for the SPC, having been involved as a student, a research advisor, and a judge. As SAC, I would like to create an undergraduate-focused developmental complement to the competition. This would center on coaching technical communication skills via a designated technical session or poster session, introduction to industry and academic career paths, resume support, and formal recognition in the conference program. Additionally, I would like to see increased promotion and structure for the student mixer at every conference. In Seattle the food was excellent, and an informal "speed dating" session provided great networking opportunities. I believe we can build on these successful programs at future OCEANS conferences by leveraging the density of professional talent to host panels for students focused on maritime career paths in academia, industry, and government. Combined with a career fair and resume portal, we can strengthen connections between our academic institutions and industry partners, and provide clear career and research pathways for students.

Finally, the OCEANS conferences provide an opportunity to expand on the society's connections to pre-college students. The exhibitor hall at OCEANS is fascinating, and we should leverage it better to draw students to the maritime fields. We can start this effort by inviting local middle and high schools to the conference hall to learn about the diverse set of opportunities in marine engineering. These visits should be complemented by a booth dedicated to providing information about all of the colleges, universities, and trade schools that provide undergraduate and graduate programs in marine-related fields. I consistently hear from students that they want to work on big, relevant problems in climate and sustainability, and the marine industry is full of ways to make real, lasting impact. Let's leverage our conferences and meetings to recruit the next generation of ocean engineers and scientists!

While the OCEANS conferences provide a centerpiece for OES student activities, this spring has demonstrated we cannot rely on in-person opportunities to grow connectedness. With the OES spread across the world, the lessons learned from remote teaching and work should be applied to growing the connectedness of our society even while we are apart. To start, I plan to schedule a series of virtual meetups with student chapters so we can share the awesome activities currently taking place, and learn about plans for the future. I am confident that we can collaboratively imagine ways to increase the connections between student chapters, even if we are faced with continued disruption of our conference schedule. A distinct challenge facing the marine industry is how to expand and diversify the talent pool by drawing in students from non-traditional backgrounds. In Seattle, the gender disparity in the SPC was striking, and promoting and empowering women and minorities in the society and maritime industries needs to start at the student level and permeate throughout the field. While virtual interactions will likely have limitations, as a society we can view this disrupted time as an opportunity to expand our activities to stakeholders that may not have been able to attend conferences in the past, all while reducing our carbon footprint through reduced travel.

There is no doubt that the beginning of 2020 has been challenging. I feel incredibly privileged to be struggling with online teaching and planning remote undergraduate summer research opportunities while blessed with good health. While the path ahead is far from clear, no matter if we are together again in Singapore or Biloxi this fall or not, my goal as SAC is to foster connectedness within the maritime student community. I have benefitted personally and professionally from the opportunities presented to me by the OES, and I humbly look forward to working on your behalf.

As a New OES Calendar Coordinator—Stephanie Kemna

Stephanie Kemna, OES Calendar Coordinator

Hi all!

I am Stephanie Kemna, former IEEE OES Young Professional (YP) Boost recipient for 2019, and now OES Calendar Coordinator!

I got involved with IEEE OES in 2018 when I first applied to the *YP Boost program* but was still in a PhD program. I then started participating in the student activities meetings, headed by Brandy Armstrong, and became a *social media reporter* at OCEANS 2018 Charleston, which meant my conference visit was co-funded by IEEE OES. That was an ideal situation for someone who had just graduated and started at a new company! After OCEANS Charleston I applied again for the YP Boost program, and received funding in 2019 to attend both OCEANS conferences in Marseille and Seattle, while getting the opportunity to become more involved with IEEE OES.

Here I am at OCEANS Marseille, dubiously awaiting what the caricaturist will make of me.· :) Photo courtesy of Farheen Fauziya

At both conferences I coordinated the social media reporting for IEEE OES, and I also participated as a judge in the student poster competition (SPC). Furthermore, I attended the *IEEE OES AdCom* meetings, and learned more about the society. These opportunities have been a lot of fun and also very rewarding! You get the chance to see more of the ocean engineering field, beyond your own expertise, interact with both junior and senior people in the field, and feel part of a broader community, that really appreciates your contributions.

This year, I am trying to do my share by keeping track of upcoming conferences for the calendar on our website – https://ieeeoes.org/conferences/conference-calendar/. Our calendar lists OES sponsored events and workshops, as well as OES recommended or relevant IEEE events. A lot of events are currently being postponed or canceled given the global pandemic, so hopefully we can keep track and provide you with the latest information, or at least provide you with a handy place with easy access to websites of conferences to check the latest info. Kind of like your private bookmark folder, but without having to share that between computers – just browse to our calendar page from any PC!

We hope you are also looking forward to some exciting conferences, whether virtual or in person, such as *OCEANS 2020 Singapore*, now August 11–14, or *OCEANS 2020 Gulf Coast*, October 19–22!

At the OCEANS Seattle Young Professionals meeting.

Chapter News

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

Victoria Chapter—Tracking Marine Solar Panel: University of Victoria Student Capstone Project

Reported by Connor Clark and team members.

This past spring, five University of Victoria engineering students took on the challenge of designing and producing prototypes for a sun-tracking, sailboat-mounted solar panel platform. Sam DeCosse (OES student member), Connor Clark, Nick Girvan, Jason Zhao, and Owen Yuan were able to produce two prototypes with the help of the IEEE Oceanic Engineering Society Victoria Chapter, then design and analyze a third in just three months.

Prototype 2, shown at Tectoria conference, with UVic team, and client, Eduard Wisernig.

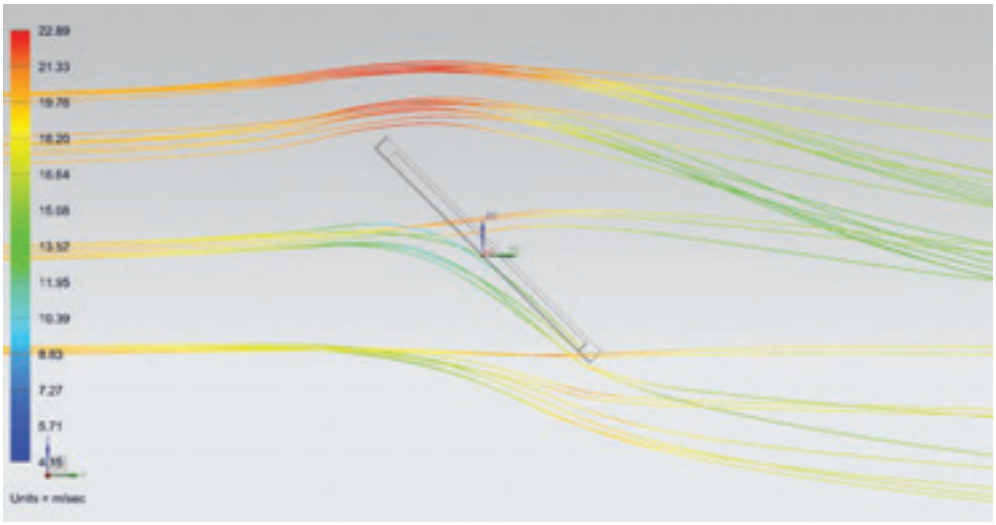
The prototypes were showcased at Victoria's Tectoria conference, presented alongside the client's other sustainable marine projects. Eduard Wisernig, of WiserTech Marine Solutions, is using the students' prototypes to help guide the final design iterations of the Seal project before taking it to market.

The first prototype was a small proof-of-concept used to test software and help identify potential design issues. This version was completed in under two weeks, features a small 40W solar panel with two servo motors for actuation, and was built out of laser cut plywood.

The second prototype is nearly full-scale, is built of aluminum and PVC and is capable of supporting a 70W solar panel. It employs a linear actuator to control altitude and a stepper motor to orient azimuthally. It was used as a base model for the phase three design, which is composed of durable marine-grade materials, such as 316 stainless steel, and includes a number of design improvements.

Stress analysis was completed using wind loading from Siemens NX computational fluid dynamics (CFD) software. This was in addition to approximations from empirical studies on wind tunnel experiments on solar panels and rougher engineering approximations, which were used to validate the CFD results. A number of critical wind loading cases were considered, for example the loading from a 40 knot tailwind acting on the rear of the panel (see the velocity streamlines below). Depending on the orientation of the panel to the wind, the Bernoulli effect can become significant, in this case pulling up on the back of the panel.

The team would like to thank IEEE OES Victoria Chapter for their generous contribution as well as Eduard Wisernig for his leadership and guidance. For further information about the project, check out his website: wisertech.ca/index.php/seal



Streamlines over Solar Panel, 20 m/s Tailwind.

Malaysia Chapter

Visit to Universiti Malaysia Perlis (UniMAP)

Reported by Khalid Isa & Zool H. Ismail

On Feb 21st, 2020, IEEE OES Malaysia Chapter organized a visit to Universiti Malaysia Perlis (UniMAP). The activities included a meeting session with YBhg. Prof. Ir. Dr. Mohd Rizal Arshad, Deputy Vice-Chancellor (Academic and International) of UniMAP cum the Past Chair of IEEE OES Malaysia, a discussion regarding organizing the 12th National Technical Seminar on

Photo session with the Deputy Vice-Chancellor (Academic and International), UniMAP.

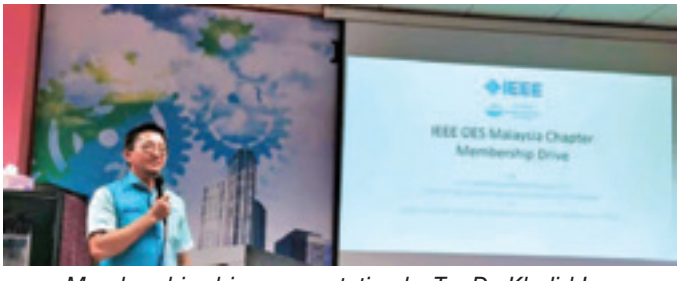
DLP presentation by Prof. Ir. Dr. Mohd Rizal Arshad.

Unmanned System Technology 2020 (NUSYS'20) in UniMAP, and preparation for the IEEE OES Malaysia Chapter Distinguished Lecture Program (DLP) in UniMAP. There are many activities in 2020 that have been discussed with the UniMAP Deputy Vice-Chancellor (Academic and International), such as a road trip to Krabi and DLP program at the Academy of Sciences Malaysia (ASM).

IEEE OES Malaysia Chapter Memebership Drive

Reported by Khalid Isa

Ts. Dr. Khalid Isa, Chair of IEEE OES Malaysia, has conducted a membership drive at UniMAP on Feb 21st, 2020. This event provides a platform for the UniMAP academician to understand and join the IEEE OES Malaysia Chapter. The IEEE membership provides the resources and opportunities to keep on top of changes in technology, get involved in standards development, network with other professionals in a specific area of interest, mentor the next generation of engineers and technologists, and so much more. The attendee has been informed about IEEE and OES in general, IEEE OES Malaysia Chapter including the benefits and fees.



Membership drive presentation by Ts. Dr. Khalid Isa.

Distinguished Lecture Program (DLP)

Reported by Khalid Isa & Mohd Rizal Arshad

On Feb 21st, 2020, IEEE OES Malaysia Chapter has organized a Distinguished Lecture Program (DLP) at the Pauh Putra Main Campus, UniMAP. The DLP topic entitled ASV and AUV

Photo session with the attendees (UniMAP academician).

Robotics Platform Technology: Advancement and Potentials, has been presented by Prof. Ir. Dr. Mohd Rizal Arshad. This DLP was attended by UniMAP academician and has been held for two hours, starting from 3.00 pm until 5.00 pm.

Japan Chapter—The third Underwater Forum · ZERO held as a WEB Meeting

Reported by Harumi Sugimatsu, OES-J Vice Chair

The third Underwater Domestic Forum · ZERO was held as a WEB meeting on 24th April 2020, in Tokyo under a state of emergency due to the spread of coronavirus infection. It was the first attempt for us to hold the forum as a WEB meeting, however we decided to keep holding the forum periodically to share the information and networking with people even in this critical situation. All speakers and participants, over 250, attended it remotely that day. For the participants who are not familiar with the WEB meeting system, we also distributed YouTube video simultaneously.

As a result, the Forum was successful, i.e., technically worked well, the number of attendees who live in a distance places was increasing (usually they could not attend), more active Q&A than usual forums, etc. Many attendees requested us to keep the WEB meeting style along with a face to face meeting style in the future.

IIS, U-Tokyo Campus where the 3rd Forum originally to be held. The season is changing from cherry blossoms to fresh green leaves.

Toshihiro Maki, a forum steering committee member, was working for the web forum.

Engineers supported the web forum.

A key point is that the Forum was a domestic one, therefore only a few people living in a time difference area were attending. We are now in the turning point of the technology. VR technology will take us to a more-higher place where what we do, and what we should do, will be considered. The third Underwater Forum · ZERO was a good opportunity for us to consider the conference style in near future.

Improving Global and Regional Ocean Observing Through Best Practices and Standards

Jay Pearlman (IEEE), Pauline Simpson (IODE), Johannes Karstensen (GEOMAR), Pier Luigi Buttigieg (AWI), Francoise Pearlman (FourBridges), Christoph Waldmann (MARUM), Cora Hoerstmann (AWI)

As many of us know, the oceans play a key role in global issues such as climate change, food security, and human health. However, there are challenges to a real understanding of the oceans including their vast dimensions and internal complexity, efficient monitoring and predicting of the planet's oceans evolutionary dynamics. Thus, the effort of ocean observing and analyses must be a collaborative effort of both regional and global scale. The first and foremost requirement for such collaborative ocean observing is the need to follow well-defined and reproducible methods across activities: from strategies for structuring observing systems, sensor deployment and usage, and the generation of data and information products, to ethical and governance aspects when executing ocean observing. Thus, "ocean observing" are all activities of the value chain from preparing and conducting observations to impacts on society through applications of information. To meet the urgent planet-wide challenges we face, common methods across all aspects of ocean observing should be broadly adopted by the ocean community and, where appropriate, should evolve into. Best Practices and Standards. Thus, these Best Practices and Standards not only make the life of individual scientists easier but also contribute to a better usage of the collected information by other groups and organizations across the value chain.

Best practices bring many benefits such as quality and consistency of observations, interoperability of data, efficiency (don't reinvent the wheel), and transparency. However, Best Practices are scattered and can be hard to find; they can be lost when a project ends, promising methods may not be shared, and work to create a Best Practice is often not acknowledged. To reduce this fragmentation, there is now an open access, permanent, digital repository of Best Practices documentation (oceanbestpractices.org) that is part of the Ocean Best Practices System (OBPS). But the system is broader. In addition to the repository, the OBPS includes a peer reviewed journal research topic (https://www.frontiersin.org/research-topics/7173/best-practices-in-ocean-observing), a forum for community discussion and a training activity for creating and using Best Practices. Together, these components serve to realize a core objective of the OBPS, which is to enable the ocean community to create superior methods for every activity in ocean observing from research to operations to applications that are agreed upon and broadly adopted across communities.

The OBPS implementation is built on a vision of "a future where there are agreed and broadly adopted methods across ocean research, operations and applications"—and a mission "to provide coordinated and sustained global access to methods and Best Practices across ocean sciences to foster collaboration and innovation" (Pearlman et al. 2019). The importance of this was recognized by the UNESCO Intergovernmental Ocean Commission (IOC), which accepted the OBPS as an IOC project in July 2019. It is operated as a collaboration of the International Oceanographic Data and Information Exchange (IODE) and the Global Ocean Observing System (GOOS).

There are many debates on what methods should be included in the OBPS to further the vision and mission. People will say, "I do not know if my practice is best, so I will not participate." Others say "we have integrated standard operating practices (SOP) to guide our work—these are our Best Practices but we don't use the name Best Practices." Thus, the OBPS accepts

Figure 1. The Ocean Observing Value Chain from observations to users.

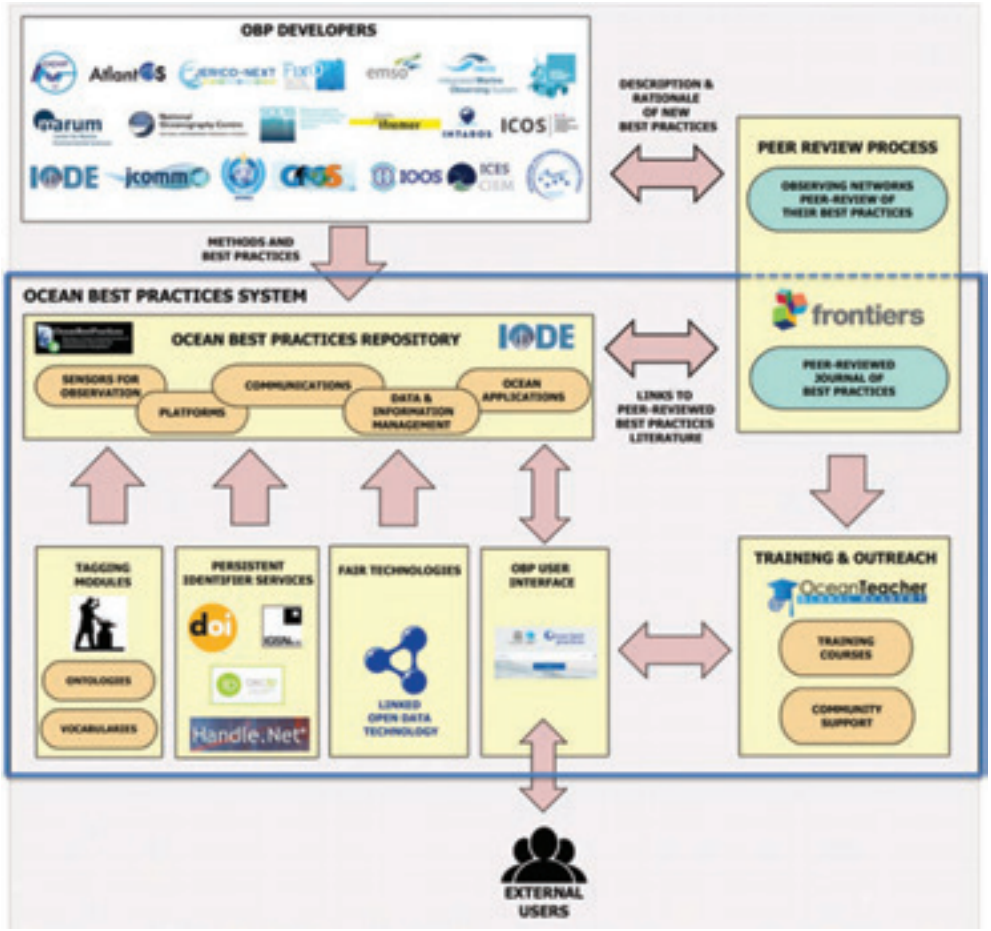


Figure 2. The Ocean Best Practices System.

all forms of methods documentation such as SOPs, manuals, etc., in addition to Best Practices. Of course, methods are not static. Technology changes, applications move to new areas with different environments and skill bases. The OBPS provides a place where Best Practices can be collected and compared and where their evolution can be documented. To do this they must be readily discoverable and accessible. The OBPS has developed a semantic-based search user interface (Buttigieg, et al, 2019), which finds and then tags documents to help users sort through the more than 1000 ocean Best Practices in the OBPS Repository. These Best Practices are available at oceanbestpractices.org.

The support and use of Best Practices are a community-wide activity in which many facets of ocean observing participate. There is an annual workshop in which scientists and engineers, both young professionals and experienced practitioners, come together to discuss community needs and OBPS capabilities. The latest workshop, the Ocean Best Practices Workshop III (OBP Workshop III), was held at the International Oceanographic Data and Information Exchange (IODE) in Oostende, Belgium, 02–03 December 2019. It was organized with support from IEEE Oceanic Engineering Society, IODE and GOOS with the objective of better understanding the future needs of the ocean observing community. The workshop outcomes were defined as: (1) an articulated strategic direction for ocean Best Practices; (2) recommendations for Best Practice synthesis; (3) the relation between standards and Best Practices; and (4) recommendations for further Ocean Best Practices System development/implementation, embedding outcomes from community input.

The 2019 Workshop III encouraged maximum audience participation and was structured with hour-long panels followed by discussion. This format was effective in stimulating ideas and discussions to lay out a future vision of ocean Best Practices and how OBPS will contribute to improving ocean observing in the decade to come. The panels addressed:

- Community inputs for Best Practices
- Key Advances in Ocean Observing and in related Technologies
- Synthesizing Best Practices
- Standards and Best Practices
- Capacity Building and Training
- Best Practices Vision for the Decade

Breakout Sessions were also a major part of the agenda, to provide opportunities for participants to share insights and, importantly, to make recommendations to the Panel on Vision for the Next Decade and ultimately the OBPS Steering Group. A detailed proceedings is available at Simpson, et al., 2020, which covers the discussion and recommendations. This paper will address some of the key recommendations.

Standards and Best Practices

An area that created a lot of discussion, led by Christoph Waldmann, was the relation and balance between standards and Best Practices. The two are closely related as Best Practices may evolve into standards while standards can leverage Best Practices descriptions for their detailed implementation. Both are developed through iterative processes that require community engagement and adoption. Culturally, the ocean research community generally works through Best Practices while the marine operations community uses many standards (for cables, ships, etc.).

This depends on the value/benefit to each of the communities. Recognizing this, the standards and Best Practices discussions noted that:

- Collecting these Best Practices in a central repository, the Ocean Best Practices System (OBPS), is of high value for the ocean observing communities and science community as a whole.
- Not all Best Practices have to be transferred to standards. It depends on the value/benefit for the community.

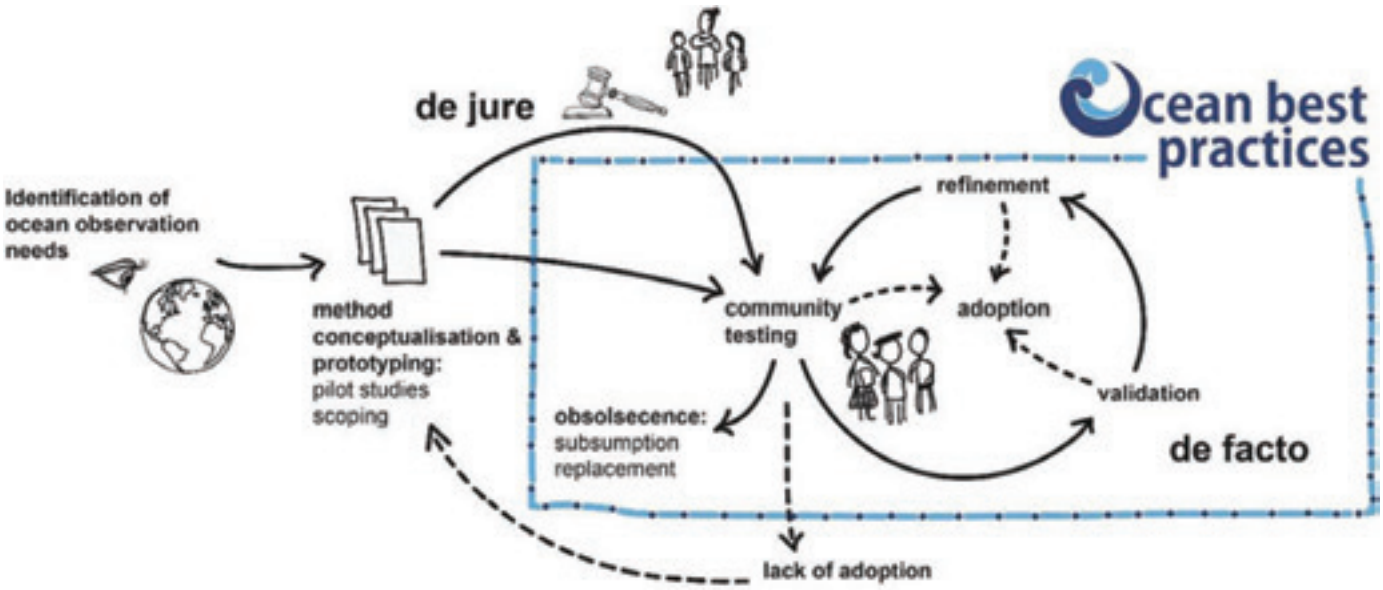


Figure 3. Evolution of Best practices (de facto) and Standards (de jure). From Hoerstmann et al 2020.

- Mission critical observations, for instance Tsunami forecasting systems, need standards.
- Metadata of data is very important for data users. The World Meteorological Organization (WMO) has developed the Observing System Capability Analysis and Review (OSCAR) tool which targets all users interested in the status and the planning of global observing systems as well as data users looking for instrument specifications at platform level.

Recommendations from the breakout included:

- Development of a more elaborate structure for the OBPS portal should be considered that makes the access to the required information more intuitive.
- Pilot projects shall be initiated to assist this process where a certain number of different use cases shall be elaborated and act as template for other domains. This will include capacity building aspects. Champions could be the cases of the carbon measuring community, ARGO, GO-SHIP, and HF RADAR. The promotion of communities like the glider community would benefit from this effort.
- It should be considered to connect OBPS Best Practices to GitHub and similar capabilities.

The importance of pilot projects to help understand the implementation of standards and Best Practices was noted in multiple discussions.

Capacity Development

The panel on capacity development recommended the creation of a "product" (e.g., peer-reviewed paper, a Best Practice, web page, training module), which would describe various types of capacity development activities (with their pros and cons) in relation to various types of Best Practices in OBPS and beyond. Such a product would not aim at providing a solution to every case, but would provide guidance on the most suitable capacity development modality according to the need, Essential Ocean Variable/platform that forms the subject of the capacity development, area of the ocean observing value chain being targeted, career stage and geographical location of target audience, as well as available budgets, etc.

While developing this product, the compilation of all the different capacity development modes highlighted should be complemented by modes previously not considered: hackathons, problem-based learning, student projects, collaborative research projects, infrastructure investments/donations, mentoring programs, training for policy makers (and school teachers), formal academic programs such as university degrees, and others to be determined. The most suitable mode depends on the participant's current knowledge and available resources. The OBPS has initiated a survey on available capacity development programs as a follow up to this discussion at the workshop.

Panel on Best Practices Vision for the Decade

The panel was led by Anya Waite. Its purpose was to integrate the discussions of the workshop into a series of recommendations for the OBPS evolution.

The characteristics of a decadal vision were broad and reflect the technical and social aspects of bringing together the community and working toward broad interoperability through the use of Best Practices, Standards and other means. The "strawman" characteristics were:

- Interoperability of data & knowledge & semantics
- Fully FAIR and known Data
- Excellent Data Management Plans
- 100% clear Provenance where data comes from and where it is being used
- Excellent Communication
- Trust in data, scientists and the general public
- Value to Society

For interoperability, both data and knowledge interoperability (at all levels) needs to be part of the discussion. Additional facets of interoperability include legal interoperability, syntactic/semantic interoperability, etc. When we use

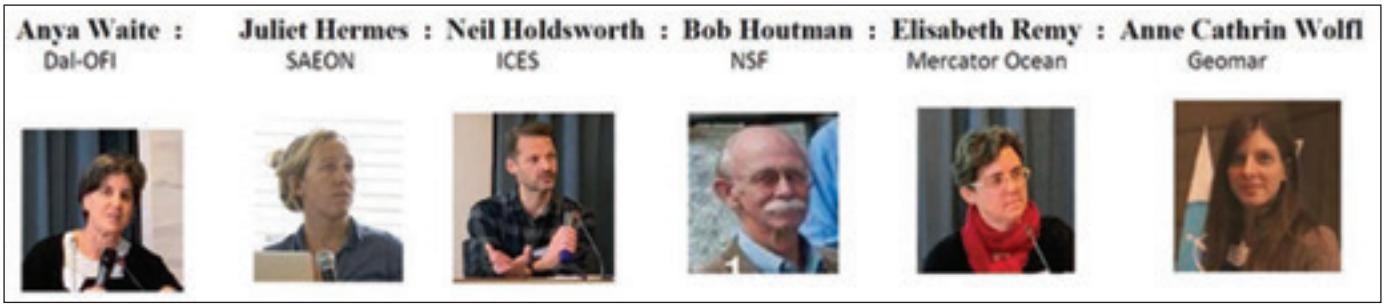


Figure 4. Panelists for the Best Practices Vision for the Decade Panel.

the term interoperability does it mean for the ocean community or for the OBPS? It is both. We have an opportunity, to engage the different communities and challenge these communities about the availability of interoperable data within and across communities/disciplines to support outcomes reaching across the value chain. These use data interoperability as a "model" for a vision, but the characteristics are applicable to the Best Practices that cover the value chain from sensing to applications to societal impact. The panel identified that, to play an effective role in furthering this vision, there are certain key attributes of the OBPS:

- Portal/User Interface
- Synthesis and Standards and Accreditation
- Outreach and Communication
- Capacity Development and Retention

Participants in the workshop were asked to rank these through a real time poll. The results are shown in Figure 5.

The lighter distributed colors show the voting patterns for each of the four subjects. The participants identified the portal/interface as the highest priority with outreach/communications second. The message is that participants believe that the OBPS must continue its move from passive accumulation of BPs towards engagement and collaboration. Upgrades to the interface are already under way. Outreach and communication—including developing a communication plan—needs strengthening beyond the activities that have been done so far. It is interesting to reflect that the convergence among similar Best Practices and the creation of standards was the lowest in the ranking of the four. Standards have not been readily accepted by ocean observers due to the top down nature of standards creation. For the data and information practitioners, both *de jure* and *de facto* standards such as OGC WMS or NetCDF formats have found growing acceptance.

The final recommendations of the panel and the workshop focused on six areas of development, some long-term, but many for the next year or two. A detailed discussion of these is available in the workshop proceedings (Simpson, et al., 2020). The development areas were:

A Five-Page Description of Best Practices for Best Practices (BP4BP). This supports community development and submission to the OBPS. The paper was written following the workshop and is available in the OBPS repository (Hoerstmann, et al., 2020)

Position Paper to Journal Editors. Peer reviewed paper authors are more and more being required to publish the data underlying the research outcomes. The workshop recommended that the methods (Best Practices) used to collect and analyze the data should also be published as part of the peer-reviewed research. We recognize in making this recommendation that making BP citation a requirement might be too strong, as we don't have full convergence on each BP. It is possible that some people won't agree with the BPs that have been published and will instead cite their own practice in a paper.

Connect OBPS to other repositories. This can include GitHub for software and selected fora for community discussions. In response, the OBPS is implementing such a forum for community dialogues.

Outreach and Communications. A July 2019 Survey on ocean Best Practices showed that approximately 30% of the 450 respondents knew about the OBPS. Of those who knew about it, 80–90% would recommend its use. This is a clear indicator that more outreach is required.

Pilot Project on Synthesis. In the Breakout session on synthesis, there was a discussion on possible pilot case studies to address synthesis among Best Practices. Some of the areas suggested included: Microplastics; e-DNA; Acoustics (sound); Capture fisheries; Machine learning; and Harmonization of metadata. It is expected that the workshop in 2020 will address some of these options.

Capacity Development Pilot Project—There are a lot of varied methodologies that are being used for capacity development.

Figure 5. Ranking of areas for further OBPS development.

Figure 6. Workshop participants from many countries and disciplines contributed to the discussions and outcomes.

In terms of a repository of training methods/Best Practices, the panel acknowledged that it would take significant work. This area follows up the discussions at the OceanObs'19 Conference (http://www.oceanobs19.net), which made similar recommendations.

Workshop Participation

The importance of engineering participation in the creation of Best Practices cannot be understated. The workshop was fortunate to have a mix of science, engineering and operations expertise. Participants in the workshop are shown in Figure 6. It was this participation that made the workshop what it was.

Acknowledgements

The organizers. gratefully acknowledge the *Ocean Best Practices System Steering Group* for providing organizational, and/or logistical and in-kind support for Workshop III. We particularly acknowledge the co-sponsorship of IEEE, which enabled broader participation in the workshop, particularly of young professionals. In addition, co-sponsorship was provided by IODE and the NSF-sponsored OceanObs Research Coordination Network (NSF grant 1728913, Research Coordination Networks (RCN): Sustained Multidisciplinary Ocean Observations). Participants included members from the following IEEE OES Technology Committees: Current, Wave, Turbulence Measurement and Applications; Ocean Observation Systems and Environmental Sustainability; Ocean Remote Sensing; and Standards. Also, Roberto Petroccia YP Boost 2019-2020, attended the workshop.

Material for this article was extracted from the proceedings of the Evolving and Sustaining Ocean Best Practices Workshop III 2019 (Simpson, et al., 2020)

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ANNOUNCEMENT: Offshore Technology Conference Asia 2020 To Go Virtual

The Offshore Technology Conference Asia (OTC Asia) recognises the unprecedented and ongoing global challenges associated with the COVID-19 pandemic. The health and safety of our partners, attendees, exhibitors, and staff are of utmost importance.

Considering the rapidly changing guidance and restrictions by governments and companies, and following consultation with key partners and stakeholders, the decision has been made to transition OTC Asia 2020 to a virtual event in the fourth quarter of 2020. We are actively working to confirm dates in October or November.

By shifting to a virtual event, we are committed to providing the industry a platform for continued knowledge-sharing and professional development to preserve the significant work of the programme committee and authors to prepare for this conference. In addition, it will provide opportunities for businesses to showcase solutions, network and engage with long standing and potential clients during this challenging time.

We are excited to be a part of this pioneering effort by the not-for-profit professional associations that organise OTC Asia. We look forward to the solidarity and collaboration of our industry and its leaders to support this inclusive opportunity to bring the industry together through digital innovation to share and discuss the latest insights on the challenges we are facing.

We understand there will be many questions about what a virtual OTC Asia will entail. OTC Asia will be communicating more information as plans are finalised.

We thank you for your patience and understanding given these complex circumstances.

We look forward to your participation in OTC Asia 2020 later this year.

Cindy Yeilding
OTC Board Chair
Senior Vice President
Strategic Initiatives
BP America, Inc.

Neil Kavanagh
OTC Asia 2020
Oversight Committee Chair
Chief Scientist
Woodside Energy

Mohamed Firouz Asnan
OTC Asia 2020
Conference Programme Committee Chair
Senior Vice President
Malaysia Petroleum Management
PETRONAS

Chayong Borisuitsawat
OTC Asia 2020
Conference Programme Committee Vice Chair
Executive Vice President
Engineering and Development Group
PTTEP

Richard Kho
OTC Asia 2020
Conference Programme Committee Vice Chair
Managing Director,
Global Solutions, Malaysia
Shell

About OTC Asia
Since the maiden OTC Asia was held in March 2014 in Kuala Lumpur, it has established itself as Asia's premier offshore energy event. OTC Asia, which is programmed to benefit the industry in the region and around the globe, is a collaborative effort amongst 13 sponsoring non-profit academic, scientific and professional organisations dedicated to the advancement and diffusion of scientific and technological knowledge of offshore resources and related environmental matters.

For further information please contact otcasia@otcnet.org or visit 2020.otcasia.org.

Sponsoring Organisations
American Association of Petroleum Geologists
American Institute of Chemical Engineers
American Institute of Mining, Metallurgical, and Petroleum Engineers
American Society of Civil Engineers
American Society of Mechanical Engineers
Institute of Electrical and Electronics Engineers, Oceanic and Engineering Society
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OFFSHORE TECHNOLOGY CONFERENCE ASIA

P.O. Box 10056, 50700 Kuala Lumpur, Malaysia
Telephone: +60.3.2182.3000 • Facsimile: +60.3.2182.3030 • Email: otcasia@otcnet.org • Website: www.otcasia.org

ANNOUNCEMENT: Offshore Technology Conference Asia 2020 – New Dates

Due to the ongoing global public health concerns related to COVID-19, and following extensive consultation with our key partners and stakeholders, the decision has been made to reschedule the Offshore Technology Conference Asia (OTC Asia), originally scheduled 24-27 March 2020 at the Kuala Lumpur Convention Centre in Kuala Lumpur, Malaysia.

OTC Asia 2020 will now be held 17-19 August 2020 at the Kuala Lumpur Convention Centre.

With these rescheduled dates, we are committed to delivering a successful event and platform to provide our participants with the foundations of a quality technical programme for knowledge-sharing and professional development, and business exhibition.

Since the maiden OTC Asia was held in March 2014 in Kuala Lumpur, it has established itself as Asia's premier offshore energy event. OTC Asia, which is programmed to benefit the industry in the region and around the globe, is a collaborative effort amongst 13 sponsoring non-profit academic, scientific and professional organisations dedicated to the advancement and diffusion of scientific and technological knowledge of offshore resources and related environmental matters.

We look forward to the solidarity and support of our industry and its leaders for OTC Asia to continue to achieve this mission.

OTC Asia will be reaching out to all participants to confirm their rescheduling arrangements.

Our thoughts are with those impacted by this outbreak around the world.

We thank you for your understanding given these complex circumstances and look forward to your participation in OTC Asia 2020 this August.

Cindy Yeilding
OTC Board Chair
Senior Vice President
Strategic Initiatives
BP America, Inc.

Neil Kavanagh
OTC Asia 2020
Oversight Committee Chair
Chief Scientist
Woodside Energy

Mohamed Firouz Asnan
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Lerici, Italy • 1-3 September 2020

POSTPONED to September 2021

Supported by:

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IEEE Oceanic Engineering Society

ATLAS ELEKTRONIK

IEEE OES AUV2020 Symposium

AUV2020 moves to remote mode

After hosting its largest ever delegation in Porto, Portugal in 2018, the IEEE OES AUV Symposium was scheduled to head to St. John's, Newfoundland and Labrador, Canada.

Due to concerns around COVID-19 and resulting travel restrictions, all AUV2020 sessions will now be held remotely. Memorial University is proud to continue its partnership with the IEEE OES to deliver this year's symposium in a new and innovative format. The symposium will include recorded and real-time events to accommodate attendees in different time zones. Keynotes, workshops, presentations, the student poster competition, networking opportunities, virtual tours, and social programs will be brought to you in the comfort of your own home.

The abstract submission deadline has been extended to **May 30**. Registration fees will be discounted and a new pricing structure will be announced soon. Keep up-to-date by visiting **auv2020.org** or find us on Twitter, **@AUV2020**.

Important Dates

Deadline for abstracts: **May 30**

Notification for authors: **June 15**

Deadline for full paper: **August 1**

AUV2020 has invited authors to submit contributions on the following topics:

- Vehicle design
- Vehicle navigation
- Sensor design & data fusion
- Vehicle control
- Autonomy
- Mission planning
- Applications
- Multi vehicle systems
- Open source robotics

Call for Nominations for the IEEE OES Autonomous Maritime Systems Award

The Autonomous Maritime Systems Technology Committee of the IEEE OES would like to ask you to nominate persons who should be recognized in our community for their accomplishments in the autonomous maritime systems (AMS) field. The awards will be presented during a special online session of AUV2020.

Please send the following information to the Awards Committee:

- Nominee's name
- Affiliation
- Recommendation letter with detailed reasons why you nominate the person.

Nomination of others and self-nominations are both welcome.

Email your nominations to the AUV2020 Awards Committee at: **awards@auv2020.org**

Mario Brito, Anna Wåhlin, and Yanwu Zhang to deliver plenary talks

Dr. Mario Brito is an Associate Professor in Risk Analysis and Risk Management at the University of Southampton. He will present "Towards using Machine Learning for Autonomous Underwater Vehicles Mission Risk Quantification" at AUV2020.

Dr. Anna Wåhlin is a Professor of Physical Oceanography at the Department of Marine Sciences, University of Gothenburg. She plans to bring "An AUV underneath the 'Doomsday glacier': Revealing pathways and modification of warm water flowing beneath Thwaites ice shelf, West Antarctica" to symposium attendees.

Dr. Yanwu Zhang is a Senior Research Engineer at the Monterey Bay Aquarium Research Institute (MBARI). He will deliver "Targeted Sampling by Autonomous Vehicles" during this fall's online session.

Find full speaker biographies and plenary descriptions at: **auv2020.org/program/**

International Symposium on Underwater Technology
March 1 - 4, 2021
IIS Conference Hall "Haricot" Tokyo, Japan
Advanced Underwater Technology for the Ocean

The University of Tokyo is delighted to welcome international experts for the International Symposium on Underwater Technology (UT21). UT21 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.

UT21 Online Event will be re-organized during the original symposium dates. Details will be announced soon.

See you again personally at UT23 in Tokyo!

CALL FOR PAPERS

UT21 invites the researchers and engineers from research institutions, and industries from ar their contributions.

- **Environmental Monitoring**
- **Marine Robotics**
- **Marine Mineral Resources**
- **Renewable Energy**
- **Marine Construction**
- **Observatory and Disaster Mitigation**
- **Fishery Engineering**
- **Acoustics and Communications**
- **Sensors**

Authors are asked to prepare 2-page abstract with text between 500 to 1000 words, with figures and tables. PDF files of the abstract are to be submitted via web-based submission site.Authors of accepted abstracts are expected to prepare and submit a manuscript for symposium proceedings to be distributed at the conference. (4 to 10 pages in the IEEE Standard double-column format.)
All papers presented at the conference and included in the conference proceedings will be published on IEEE Xplore©

STUDENT POSTER COMPETITION

UT21 Student Poster Competition will offer students the opportunity to attend the UT21 and present your research works. Students are asked to prepare 2-page abstract with text between 500 to 1000 words, with figures and tables. PDF files of the abstract are to be submitted via web-based submission site. The abstracts submitted will be reviewed by the Student Competition Committee.
Students of accepted abstracts are expected to prepare and submit a manuscript for symposium proceedings to be distributed at the conference (4 to 10 pages in the IEEE Standard double-column format.)
Students are to prepare poster for presentation at the conference and also participate in the poster discussion time at the symposium in Tokyo.

UT21 will provide l travel support for the student Student Poster Compet

paper and est student poster awarded during the

page open: **April, 2020**
stract Submission: **September 18, 2020**
of Acceptance: **October 16, 2020**
ne for Paper Submission: **December 11, 2020**
eadline for Early Registration: **January 21, 2021**
Symposium Dates: **March 1 - 4, 2021**

SPONSORS

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

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Katsuyoshi Kawaguchi, JAMSTEC
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Masanao Shinohara, ERI, The University of Tokyo
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Blair Thornton, IIS, The University of Tokyo /University of Southampton
Secretariat
Harumi Sugimatsu, IIS, The University of Tokyo

SPONSORSHIP OPPORTUNITIES

In conjunction with UT21, 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

E-mail: info@ut2021.org
Or visit our website: http://www.ut2021.org

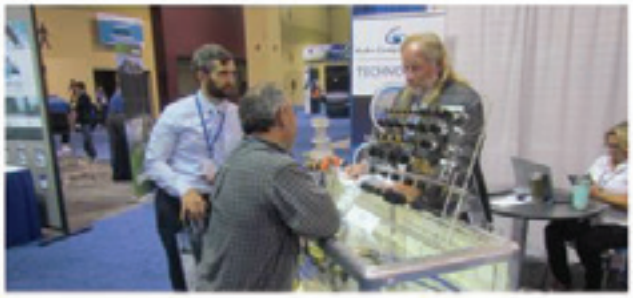
OCEANS 2020 GULF COAST AND 2020 SINGAPORE GOING VIRTUAL:
5 – 30 OCTOBER 2020
GULF COAST WILL RETURN PHYSICALLY:
23 – 29 SEPTEMBER 2023

OCEANS
CONFERENCE & EXPOSITION

IEEE Oceanic Engineering Society (OES)

marine technology SOCIETY

Time is fast approaching for the upcoming OCEANS 2020 conference hosted in Gulf Coast Mississippi. We expect more than 2,000 attendees and will feature experiential content tracks as well as exciting opportunities to engage with attendees in the interactive exhibit hall and/or thru unique sponsorships.



VISIT OUR WEBSITE FOR THE LATEST INFORMATION

The conference will be held at the renovated Mississippi Coast Convention Center and the famous Beau Rivage Resort & Casino will be the host hotel.

For more information in booking your company's activation or information on the next steps for getting involved visit OceansConference.org or contact

Todd.Gilmore@mci-group.com
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OCEANS 2021 San Diego

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DON'T MISS THE WORLD'S PREMIER OCEANS EVENT –

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SEPTEMBER 20-23, 2021

"SUSTAINING OUR OCEANS…
…SUSTAINING OUR FUTURE"

THROUGH OUR 3 PILLARS:

"InFocus" **– on the latest in new and emerging technologies**

"InQuire" **– on innovative research and science**

"InVest" **– investment strategies and spending priorities across government and industry**

OCEANS 2021 HIGHLIGHTS INCLUDE:

- 200+ EXHIBITS -
- 10+ TECHNICAL TRACKS -
- EXTENSIVE SCIENTIFIC SESSIONS -
- TUTORIALS -
- STUDENT POSTER COMPETITION -
- GOLF TOURNAMENT -
- UNDERWATER FILM FESTIVAL -

TO STAY INFORMED, VISIT:
SANDIEGO21.OCEANSCONFERENCE.ORG

Welcome to COA 2021!

2021 IEEE/OES China Ocean Acoustics Conference - COA 2021, Harbin, China

*27-30 May 2021 *The conference has been shifted from 2020 to 2021 due to COVID-19*

The second IEEE/OES China Ocean Acoustics Conference (COA 2021) will be held from 27th May to 30th May, 2021 at Harbin, China. Conference chair, Professor Yang Desen, welcomes all colleagues in marine acoustics and related fields to submit latest research in the up-coming conference. COA 2021 will focus on discussing, exchanging and sharing the cutting-edge research topics, by well-known scholars worldwide, creating new opportunities for cooperation. The conference will present the latest research in marine and underwater acoustics through invited and contributed papers. For more info, please visit the URL as below.

ULR: http://www.chinaoceanacoustics.cn/COA2021

The 2016 IEEE / OES China Ocean Acoustics Symposium (COA2016), initiated by Professor Yang Desen (Harbin Engineering University) and Professor Jean-Pierre Hermand (Université Libre de Bruxelles) was a great success and established a high-level platform for international cooperation and scientific exchange. COA 2016 attracted extensive attention from academic circles in the mainland and abroad.

Continuing this tradition, second IEEE/OES China Ocean Acoustics Conference (COA 2021) will be held from 27th May to 30th May, 2021 at Harbin, China. Conference chair, Professor Yang Desen, welcomes all colleagues in marine acoustics and related fields to submit latest research in the up-coming conference. COA 2021 will focus on discussing, exchanging and sharing the cutting-edge research topics, by well-known scholars worldwide, creating new opportunities for cooperation. The conference will present the latest research in marine and underwater acoustics through invited and contributed papers.

All accepted and presented full-papers will be submitted for publication in the IEEE Xplore and will be indexed at EI Compendex. Selected papers will be recommended for review and publication in IEEE journal. Scholars and students are welcome to submit contributions and participate in the conference to exchange new ideas, new technologies and new methods.

The conference program will also include tutorials by well-known experts on topics relevant to marine acoustics research. A technology exhibition will also be held during the conference to show-case advanced marine and underwater acoustic instruments, equipment and systems from Chinese and international manufacturers.

Conference Dates: May 27-30, 2021

Registration: May 27, 2021

Technical Sessions: May 28-29, 2021

Tutorials: May 30, 2021

VENUE: Harbin, China

ORGANIZING COMMITTEE

Honorary chair: YANG Shi-e

Co-Chair: YANG Desen

Technical Committee Chair: YIN Jingwei, QIAO Gang, Suleman Mazhar

Finance Chair: HU Bo

Secretary: WU Yingzi

Treasurer: FENG Xuan

Local Coordinator: LIU Songzuo

Student Affairs Chair: WANG Jianan

Publication Chair: ZHOU Tian

Social events Chair: MENG Yu

IMPORTANT DATES

Abstract submission date: Mar. 20, 2021

Notification of acceptance date: Apr. 20, 2021

Full paper submission date: Apr. 30, 2021

Please submit extended abstract (in English) online. The abstract should consist of minimum 500 words and can be up to 2 pages including necessary diagrams or tables. Final paper requires 4-6 pages.

CONTACT: Wu Yingzi, 18846070800 (Harbin Engineering University)

EMAIL: COA2020@hrbeu.edu.cn, wuyingzi@hrbeu.edu.cn

A Toast to the Future! . . . Here's to the Good Times Ahead!!

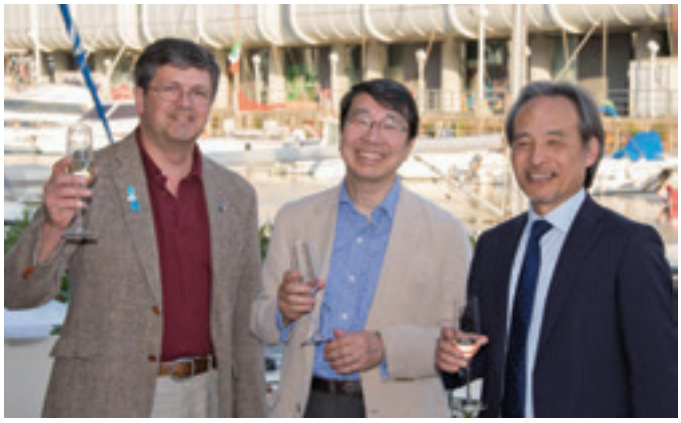
Bob Wernli—Beacon Co-Editor-in-Chief, photos by Stan Chamberlain

With the uncertainty of the future and the concerns regarding the Coronavirus, we think that we should replace our usual "Blast from the Past" with "A Toast to the Future." Yes, our existing conference schedule has been changed dramatically, and our "grip and grin" sessions have been few and far between, but we need to keep a positive outlook and plan for when we can all get together again. So . . . here's ***"A Toast . . . from the Past . . . to the Future." Keep smiling.***

OCEANS 2017 Aberdeen

OCEANS 2017 Aberdeen

OCEANS 2019 Aberdeen



OCEANS 2015 Genova Leadership 2

OCEANS 2007 Vancouver

OCEANS 2016 Monterey

OCEANS 2016 Shanghai

OCEANS 2015 Washington

OCEANS 2018 Kobe Gala

OCEANS 2011 Santander Gala

OCEANS 2015 Washington Leadership

OCEANS 2016 Monterey Leadership

OCEANS 2011 Santander Gala

OCEANS 2008 Kobe

Global OCEANS 2020: Singapore-U.S. Gulf Coast

The enduring COVID-19 pandemic does not allow the Marine Technology Society and the IEEE Oceanic Engineering Society, co-sponsors of OCEANS 2020 Singapore and OCEANS 2020 Gulf Coast, to hold these conferences as planned with all their regional distinctiveness by their respective organizing committees.

Safety of the participants being paramount, the organizing committees have decided to combine forces and invite worldwide community participation to a single virtual conference "Global OCEANS 2020: Singapore – U.S. Gulf Coast", which will feature a mix of live and on-demand events available to all registrants at a very affordable rate, October 5-30, 2020.

Further details of this first-ever virtual OCEANS conference will be posted in the coming weeks on the conference website and on the Societies' social media channels.

Zdenka Willis, President, Marine Technology Society &
Christian De Moustier, President IEEE Oceanic Engineering Society
(For Sponsoring Societies)


GLOBAL OCEANS 2020:
SINGAPORE – U.S.
GULF COAST
THE FIRST EVER GLOBAL VIRTUAL OCEANS CONFERENCE COMBINING OCEANS SINGAPORE & GULF COAST 2020!
OCTOBER 5-30, 2020
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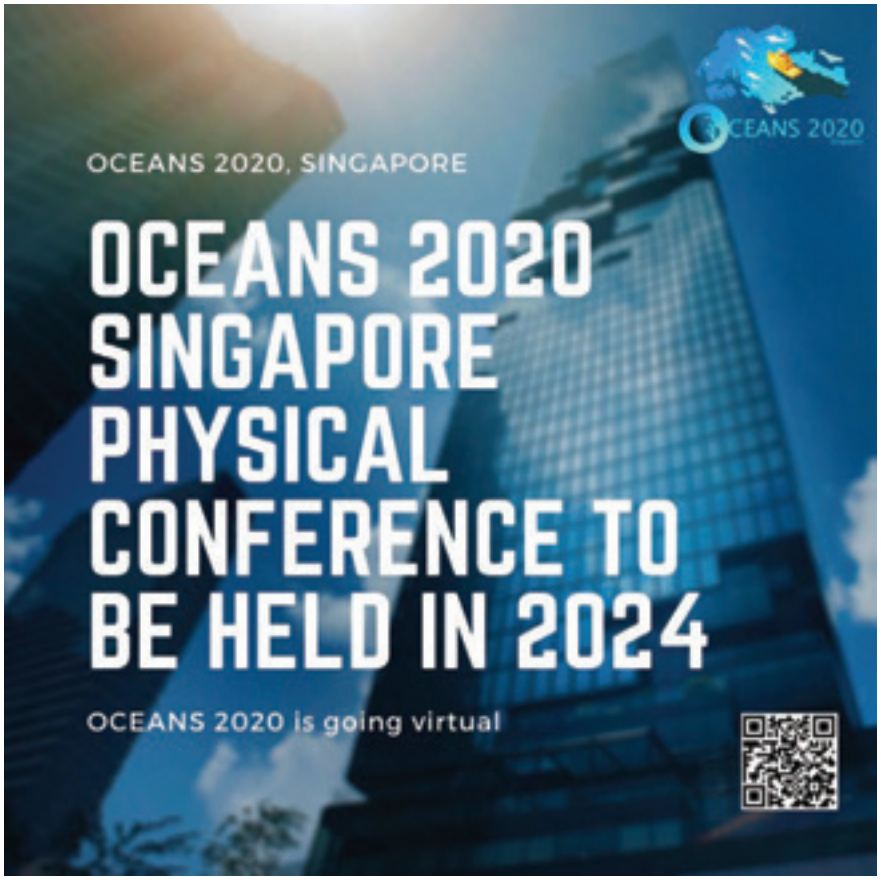
OCEANS 2020, SINGAPORE
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OCEANS 2020 is going virtual

Who's who in IEEE OES

Fausto Ferreira, IEEE Senior Member, OES AdCom Member

It's always hard to write about yourself. It's also hard to keep the reader's attention through the whole article. So, I will start with the fun part and hopefully entice you to read until the end.

My relationship with the ocean starts in my childhood. At the age of 4, I was so convinced that I wanted to be a yacht builder that I sent a letter about it to a TV show. Looking at what I am doing now (marine robotics), I didn't end up too far from it. My fascination with robotics also begins at an early age when my aunt gave me a toy robot. Since then, I wanted to study robotics. I ended up finishing a Master's degree in Electrical and Computer Engineering at Instituto Superior Técnico in Lisbon, Portugal. My thesis was on autonomous docking for a search and rescue ground robot, which culminated in a patent. After graduating, I moved to Italy as a Marie Curie Early Stage Researcher (ESR) at the National Research Council (CNR) of Italy. What was supposed to be a one year contract but became a two-year contract, and after 12 years, I still work in Italy.

I can't jump into what I did in my first job and the first few years of my research career without talking about the missing piece of the puzzle. Before I finished primary school, I discovered a sport that I still practice today, orienteering. In an orienteering competition, athletes are given only a map and a compass and must find their way from one point to another with no other information. It's an individual sport that gives the freedom to choose your own path in the forest. I guess the orienteering mentality has been reflected in my career.

First, because in my first job I worked in vision-based Simultaneous Localization and Mapping (SLAM) for underwater vehicles. But also because I have chosen an unorthodox career path. In the first few years, I had a linear course. Following the end of my ESR position, I stayed at CNR as a Research Associate and enrolled in PhD studies at the University of Genoa. I worked in the same area, enlarging the scope of my research from underwater computer vision to sonars and Automatic Target Recognition (ATR). Throughout my PhD, I had the opportunity to spend six months as a Visiting Scientist at the NATO STO Centre for Maritime Research and Experimentation (CMRE) in Italy and three months at the University of Miami in the U.S., funded by the Office of Naval Research Global (ONRG). Close to the end of my PhD, in July 2014, I joined NATO STO CMRE as a Scientist. I became more involved with robotics competitions (both marine and multi-domain) and have been Deputy Director of our annual robotics competition ever since. I have also been strongly involved in the organization of UComms, an underwater acoustic conference organized by CMRE with the support of IEEE OES, among others.

By now you might be wondering at what point this story becomes unorthodox. Well, in late 2015, I enrolled in a Bachelor of Science in Political Sciences and International Relations. Confused? Being the son of an engineer and a language teacher, I always had a place in my heart for social sciences, so to me, exploring this new avenue seemed obvious. I graduated in late 2018 with a thesis on regulatory and liability issues of autonomous surface vehicles, which blended both of my backgrounds.

Currently, I am continuing my research in this area. Specifically, I'm interested in collision avoidance regulations for autonomous marine vehicles (surface and underwater) and their relation to the current laws for ships and submarines. I am spending some time as a Visiting Scholar at the Faculty of Law, University of Zagreb.

The two YP-BOOST Program members.

My fiancée and I ready for the UComms'18 Gala Dinner.

With Bill Kirkwood (OES AdCom) and BTS Committees Chairs (Zoran Vukić, Nikola Mišković, Ivana Mikolić and Antonio Vasilijević).

Volunteering for OES came naturally to me. As a teenager, I volunteered in my local cultural association, helping to organize theater and music festivals. Sometimes I would even participate as I've studied music for 11 years (my other hobbies include writing for newspapers, travel and reading). I have also helped my club organize foot and mountain bike orienteering events including World Cups. During my PhD, I collaborated with the School of Robotics in several robotics workshops for youngsters. Later, due to my involvement in marine robotics competitions and the interest of OES in this kind of activity, the two dots connected.

In 2018, I was selected as one of the two Young Professionals for the inaugural OES YP BOOST Program. I started contributing to the society as a judge in the Student Poster Competition and in the social media initiative. But it wasn't until 2019 that I had the honor of being part of the Administrative Committee (AdCom), joining a great group of fellow scientists and engineers. It is a pleasure to volunteer and give back to the society that organizes OCEANS and so many other workshops and keeps the quality of scientific output high through the Journal of Oceanic Engineering.

In the past year, I became involved in the OCEANS Reconnaissance Committee (RECON) with a particular focus on finding potential European venues. I initiated contact with the University of Limerick to organize OCEANS'23 for which I will serve as OES Liaison. I recently also began a supervisory role of OCEANS tutorials. In this new position, I am guiding the local tutorials chairs in all the phases of organizing the tutorials. We are currently trying new models for the tutorials including free registration (for attendees already registered for OCEANS) and making sure that the content remains relevant and popular. Most recently, I volunteered to join the Membership Development Committee to help my colleagues keep up the excellent work done for attracting students and young professionals. I have some proposals for promoting early career professionals and keeping students engaged after graduation. At the same time, I am part of the Autonomous Marine Systems Technical Committee. Within this committee, I am mainly involved in marine robotics competitions around the world, such as the Singapore AUV Challenge, the European Robotics League, and RobotX. You can always find me at one of those challenges, at any OCEANS, UComms or at the annual Breaking the Surface workshop.

Breaking the Surface (BTS) is an interdisciplinary workshop that gathers practitioners in the field of marine robotics and applications (archeology, biology, security, and geology). BTS is a very special workshop for me. Not only because I have attended every single edition (10 years in a row) or because I performed sea trials and demos several times. Nor just because since 2019, OES is a sponsor of this event, and there are plans to expand it soon to other geographic areas. But ultimately, because I met my fiancée there in the 2016 edition! We are now spending the quarantine together and trying to plan a wedding during these strange times of COVID-19. It's not easy, but the most important thing is to be safe! My life has been an incredible journey and I hope it continues. I would be delighted to help you get more involved with OES activities and leadership, but I can't promise you will find a wife!

Member Highlights

Contact the Editors if You Have Items of Interest for the Society

Marinna Martini Transfers from USGS to NOAA National Marine Fisheries

Marinna Martini

If you had asked me 6 months ago what I would be doing a year from now I would have said—retiring. After 30 years of service to the USGS (United States Geological Survey, Department of Interior), I was enticed by the opportunity to give more time to IEEE, amateur radio, community service, learn about astronomy (and sleep in after a night of observing), travel to more competitive curling, take long trips away with Al to New Zealand, across country and see national parks, and so on. Maybe I would consult with my new Professional Engineering license. That was the plan.

My career at USGS began with building data loggers, getting to use the latest cool technology, designing moorings and managing projects, and peaked with the systems design and project management of a profiling bottom lander (Fig. 1) that streamed data back over the internet through the Woods Hole Oceanographic Institution's coastal observatory [1]. Work then evolved to managing a small team, grappling with bureaucracy, and processing data. The science evolved to come ashore: mapping beaches and the surf zone, where GIS skills are key and newly minted geoscience postdocs design the instrumentation. As much as I enjoyed new skills that came with the evolution (python, mapping with RTK-GPS), I missed making physical things and working directly with electronics. I missed big ships. I figured at least some of those things I could do in retirement with ham radio, and still do public service.

Enter COVID-19. No curling, no star parties, no travel for an unknown period of time. Amateur radio, at least, is a distanced activity.

Fortunate to be in government service, I remained employed and my USGS office was sent home to work. Finally, an advantage to being an introverted geek. My USGS team was in hiring mode (and still is), and so I was monitoring USAjobs.gov for postings in the Cape Cod area. NOAA (National Oceanic and Atmospheric Administration, in the Department of Commerce) was looking for an electronics engineer for the kind of work Dr. Foote and I started in 2010 [2]–[3], and was interrupted by the urgent matter of the Gulf of Mexico oil spill. I was intrigued, so I applied… and I was hired.

The new job is with the Ecosystems Surveys Branch at the Fisheries Service's Northeast Fisheries Science Center, e.g., NMFS in Woods Hole, MA. I have received a warm welcome from my new NOAA colleagues. While I am seated in the "ESB", my skills will be available to the entire Center; an opportunity to serve a more diverse group of scientists and their equipment. I am replacing Joe Godlewski, also an IEEE member, so my immediate concern will be to learn everything I can about Fisheries work, continue to support and upgrade things Joe built such as the EchoCal (https://github.com/jmgodlewski/EchoCAL) and the "Survey Sensor Package" that is used on dredges. I may also help with Habcam, (https://habcam.whoi.edu/). Something to note about EchoCal: the acoustic target calibration technique [4] the system is designed for was developed and refined by some of our own OES members, Drs. Foote and de Moustier to name two.

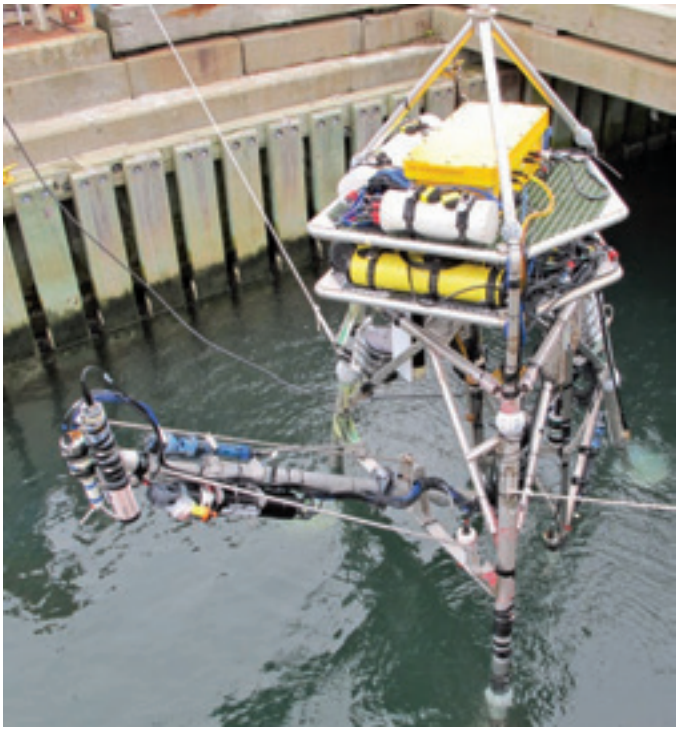

Figure 1. Profiling bottom lander being tested in 2011, the protruding arm moves sensors through the bottom boundary layer, image credit U.S. Geological Survey.

Another influence was the OCEANS Plenary Presentation: "Offshore aquaculture needs YOU!" by Lisa Vollbrecht, Research Manager, Kampachi Farms, LLC (Kailua Kona, Hawaii). It is available online (https://seattle19.oceansconference.org/plenary-offshore-aquaculture-needs-you/).

That is what I know for now, one week into my new job. To all my IEEE colleagues, stay well and best of luck in all your endeavors.

References

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IEEE Oceanic Engineering Society Election For Election of Members to the Administrative CommitteeNominees for the Term 1 January 2021–31 December 2023

René Garello, OES Junior Past President

The OES Administrative Committee election closes on 1 July. When you review the below candidates, I think you will agree that OES is truly becoming a major international society of IEEE, that includes participating members from students, Young Professionals to our Senior members. Be sure to cast your vote.

VOTE NOW at https://eballot4.votenet.com/IEEE

You will need your IEEE Account username/password to access the ballot. For quick reference, your username is <your email address>. If you do not remember your password, you may retrieve it on the voter login page. Please make sure you are signed out of all other applications in your browser. You can copy the link and paste into a private browsing window if using Firefox or an incognito window if using Chrome.

Voting must be completed no later than 1 July 2020. Any returns received after this date will not be counted. **The online voting site will close at 4:00 pm Eastern Time.**

The photos, bios and statements of our excellent slate of candidates follows. You can see their information on the voting site.

GERARDO ACOSTA (M'97-SM'01) Gerardo Gabriel Acosta was born (1964) in General Roca, Río Negro, Patagonia Argentina. He graduated as Engineer in Electronics from the National University of La Plata, Argentina (1988), and has a Ph.D. in Computer Science, from the University of Valladolid, Spain (1995). He is a Full Professor in Control Systems (Electronic Area) in the Engineering Faculty at National Buenos Aires Province Centre University (UNCPBA), Argentina. He also is Independent Researcher of the Argentinean National Research Council (CONICET), Director of the Research & Development Group "INTELYMEC", at the Engineering Faculty-UNCPBA, and member of the Directive Council of Center for Research in Physics and Engineering in Buenos Aires Province Centre, CIFICEN-UNCPBA-CICPBA-CONICET.

His working interests include the use of computational intelligence in automatic control, particularly intelligent control techniques in underwater robotics and oceanic technologies. He has more than 170 publications and 2 copyrights in this and related fields. He has been awarded with Scientific Production UNCPBA Award in 1998, an EU Marie Curie grant in 2004, the INNOVAR 2011 second position in Robotics, for the autonomous robot CARPINCHO, and the INNOVAR 2012 first position in Robotics, for the autonomous underwater vehicle ICTIOBOT, both developed at INTELYMEC-UNCPBA.

He became an *IEEE Member* in 1996, being *Senior Member* in 2001, Officer in the IEEE Argentina Section since 1999 in different chapters, received the 2010 Outstanding Chapter Award from CIS, and is a founding member and chairman of the IEEE Oceanic Engineering Society (OES) Argentinean Chapter, and member of the Administrative Committee of the OES international (2015, 2016 and 2018–2020). He also served as Counsellor of the IEEE Student Branch at UNCPBA (2001–2003). Since 2015 he is volunteering within the EARTHZINE publication as associate editor, with a group of three journalists and science writers of South America. He has been the research leader of more than 15 R+D projects, funded by the Argentinean Government, the Spanish Government and the European Union. He has been invited as a professor of PhD programs in Argentina and Spain, and is the Director of the PhD program at the Engineering Faculty-UNCPBA. He also serves as reviewer and member of the scientific committee of several national and international journals and conferences.

Statement: I have been volunteer of the IEEE for more than 17 years and particularly in OES since 2010. I had the great honour to integrate the OES AdCom (2015, 2016 and 2018–2020). In this last period I have been involved in Chapters Coordination, which is a key link between technical societies like our OES and the regional division of IEEE. I had the great opportunity of helping in the settling of new funding schemes for chapters and to make Chapter's Chairs to feel part of a great group of colleagues enlarging the scopes and activities of our IEEE OES. I have also participated in the contents and changes of the Earthzine Magazine, facilitating the contribution of many of our members and other people that are active in thinking and working for our oceans and related technology improvement. I feel I still have many things to develop in both previous topics and many others. I consider that the core activities of the Society are their publications and their periodical technical meetings and activities. In both of them I can devote time and effort. Particularly, there are three main tasks that I picked up to work on:

- IEEE OES presence in South America supporting with time and work the initiatives of our society there. The "old" ones (Rio Acoustics and the Latin American Symposium), the "new" ones (the Breaking the Surface Symposium South America) and the new ones that may appear in a near future. In addition, I would like to take care of the student branch chapter in Ecuador and the chapter in Argentina, to provide them with all of the information and possibilities to organize local activities. I would like to see new chapters and student branch chapters in other littoral countries like Brazil, Chile, Uruguay and Perú, to support and organize technical activities,

and to introduce and involve more students in the wonderful topics related to oceans and technology.
- Keeping on giving new sights and insights from the south to the Earthzine publication, with articles and coverage of oceans related activities in South America. This is a privilege mean to disseminate and promote our growing knowledge of oceans and the advances in ocean engineering to the great audience.
- Coordination of Chapters all over the world to keep OES close to regional sections and councils of IEEE, and serving to generate local activities to give visibility to our society among engineers in different countries. I will work to have a reliable communication channel among chapters, and between chapters and the society, to facilitate the organization of activities, like promoting the Distinguished Lecturers Program, teaching new members about the current funding possibilities, and starting to establish and spread a "best policies and practices" for chapters.

FARHEEN FAUZIYA (GSM'01-M'19)

Educational credentials:
- PhD. Indian Institute of Technology, ***Underwater Acoustic Communication***, February 2020
- M.Tech in Communication System with 75.1% from Manav Rachna International University (MRIU), Faridabad, Haryana in 2014. Thesis: "A Comparative Study of Phoneme Recognition using different methods"
- B. Tech in Electronics and Communication Engineering from MACET, Patna in 2010 (75.3%).

Work Experience:
- P Project Associate for one year at IIT Delhi—Worked on Modeling and representation of underwater acoustic noise.
- P Business Developer for one year at Insta Power Ltd., Gurgaon—Responsibilities included design and business development.

Achievements and Accolade:
- IEEE/OES WIE (Women in Engineering) Liaison for 2019-present.
- IEEE WIE Leadership Committee member 2019.
- Student Branch Chapter interim Chair of Marine Technology Society in IIT Delhi.
- Student Branch Chapter interim Chair of IEEE WIE-IITD student affinity group.
- Judge of Student Poster Competition at IEEE/MTS OCEANS'18 Conference, Kobe Japan 2018.
- Judge of Student Poster Competition at IEEE/MTS OCEANS'18 Conference, Charleston, USA 2018.
- Judge of Student Poster Competition at IEEE/MTS OCEANS'18 Conference, Marseille, France 2019.
- Student Social Media Volunteer at IEEE/MTS OCEANS'18 Conference, Kobe Japan and Charleston USA 2018. (https://earthzine.org/oceans-2018-charleston-coverage/)
- Session chair at ACM WUWNet 2017, IEEE/MTS OCEANS'17 Conference, Aberdeen, Scotland, IEEE/MTS OCEANS'16 Conference, Monterey, USA.
- Student poster accepted in IEEE/OES OCEANS'17. Also awarded travel grant for presenting the work.
- Student Volunteer at the workshop on Big Data and Ontology, Delhi 2015 and IEEE NCC Conference, Delhi 2013.
- Awarded travel grant IEEE/MTS OCEANS'17 Aberdeen, ACM WUWNet'17 Halifax Canada and IEEE/MTS OCEANS'18 Kobe, Japan to present and attend the conferences.
- IIT-Delhi (MHRD) institute fellowship for PhD
- Student Member, IEEE, IEEE Oceanic Engineering Society and IEEE Signal Processing Society, IEEE Women in Engineering.
- Reviewer for JASA, IEEE Access, DISP'19, TESA'19, IINTEC'17.
- TPC member for 2019 ICRAMET, SCS-NCC 2018, WSCAR 2018.

Statement: I have been a very active member of the OES since 2016, and have been a regular at OCEANS conferences. At my first conference I presented my work, increasing the quantum of participation at each subsequent event. Besides, presenting my work at these events, I have participated in multiple activities including regularly chairing sessions, judging student poster completion, social media reporting. Further, for the last one year I have been serving as the OES WIE liaison, and have been actively contributing the cause of women in STEM. As OES WIE liaison, I am a member of the IEEE WIE leadership committee.

My contributions over the said period can broadly be classified in the following areas:
- Social Media Reporting: As social media reporter at more the four OES events, I have covered diverse activities at these gatherings. I have also actively contributed to OES Beacon. Currently, I am an Associate editor of *IEEE Earthzine*.
- Volunteering activities at conference: Besides, being an active volunteer for multiple OES activities, I have been an SPC judge for four times running. Some of volunteering contributions include organising panels and informal lunches/breakfast. Before that my work was accepted as an entry to the SPC competition. I have chaired sessions at OCEANS and other conferences multiple times.
- IEEE/OES activities in my section: I have been a very active member in my IEEE section. I am the Chair of three students chapters OES, MTS and the IEEE WIE affinity group. I have been a part of the organising committee and member of review committee at multiple conferences organised/sponsored by IEEE.

Other than contributing to IEEE and OES, as a part of my Doctoral work I performed research in the area of underwater acoustic communications. I continue my work in that area. Before PhD I had worked as a research associate in a project on ambient ocean noise modelling. The learning and insights gained in the last five years have made me extremely interested in continuing research in the exciting and challenging area. My research focus is on the theoretical aspects of wireless communications. The practical application of the outcomes of my

research is in improving the performance of communication systems in the presence of noise and to exploit the directional diversity afforded by a vector sensor. Wireless communication is often the best option for subsea systems and has a number of advantages such as flexible deployment independent of existing infrastructure, enabling mobility and autonomous vehicles, deployment of distributed sensor networks, and ad-hoc network connectivity. My work has encompasses all of this and has the potential to have a significant positive impact on the ecology of our planet. The eventual objective of my work is to solve this very challenging and pertinent problem.

My doctoral work was on the performance evaluation of vector sensor based acoustic communication systems. A vector sensor has the ability to provide diversity with single sensor. Exploiting this property of a vector sensor, I have proposed a few architectures to build and analyse high performance underwater acoustic communication systems. I am also part of project that aims to develop and deploy underwater communication systems for pollution monitoring and causal analysis. Earlier I had worked on characterization of ambient ocean noise, in which I had used fractal and multi-resolution based techniques for characterizing the noise. This work is also significant because precise noise modeling is the other key element in the design of robust and high performance communication systems. I have three Journal papers and ten conference papers, nine of which are in the prestigious IEEE/MTS OCEANS conferences. Further, one of them was accepted as a student poster competition in OCEANS'17 Aberdeen.

Moving forward, I want to make an even stronger contribution to the IEEE and WIE community. Some of the ideas that I wish to put to practice include the following:

- Women in STEM in developing countries: Some ideas that I intend to push include: (i) Enabling work from home post parental leave, (ii) Provision for transferable post-doc positions, and (iii) reaching out to girl students and their guardians. Being from a developing country, who will relocate to a developed country, I bring a unique perspective, which intend to make use of in enabling Women in STEM, especially, in developing countries.
- Student participation in OES events: Expanding student activities at OES events, and aligning it with young professional and career extension activities.
- Increasing reach to include the underprivileged: Enabling remote participation of students from developing countries. It might also benefit expecting mothers and young mothers. Organising webinars to increase exposure.

I have volunteered many IEEE/MTS OCEANS conference as social media reporter and student representative in the last four years. I have also played a role of session chair in technical program of many IEEE/MTS OCEANS conferences. My contributions in this area have provided me with the opportunity to be part of the team that judges the student posters at IEEE/MTS OCEANS; I was part of that team in the IEEE/MTS OCEANS'18 conference at Kobe, IEEE/MTS OCEANS'18 conference at Charleston, IEEE/MTS OCEANS'19 Marseille and am again a member for the forthcoming conference in IEEE/MTS OCEANS'19 Seattle. Currently, I am IEEE OES WIE Liaison and serving as IEEE WIE Leadership committee member. I am also interim chair of student branch chapter of OES (Oceanic engineering Society), MTS (Marine Technology Society) and IEEE WIE (Women in Engineering) at IIT Delhi.

In conclusion, I would like to submit that not only am I uniquely placed to understand the malady of the talent on the sidelines, I am extremely motivated about this cause. This is clearly evidenced by my strong and sustained participation and contributions to the IEEE and OES activities. I believe, my strong grounding in research is another asset that can be leveraged by our OES society.

FAUSTO FERREIRA (GSM'08-M'09-GSM'10-M'15-SM'19) Dr. Fausto Ferreira obtained his Master Degree in Electrotechnical and Computer Engineering, major in Systems, Decision and Control from Instituto Superior Técnico, Technical University of Lisbon, in October 2008. He obtained his PhD in Electronic Engineering, Information Technology, Robotics and Telecommunication from the University of Genoa, Italy in April 2015. He has worked in search and rescue robotics during his Master and holds a patent based on his Master thesis. He has been working in underwater robotics and computer vision since late 2008. From November 2008 until November 2010 he was a Marie Curie Early Stage Researcher (ESR) in the EU FreeSubNet project at the National Research Council of Italy (CNR). During that time, he developed algorithms for motion estimation and mosaicking for underwater vehicles. Since January 2011 until April 2015 he was an Associate Fellow at CNR while enrolled in his PhD at University of Genoa, continuing his research in real-time mosaicking. In 2013, he was a Visiting Scientist at the NATO STO Centre for Maritime Research and Experimentation (CMRE), formerly known as NURC. He attended the OCEANS'13 Bergen Student Poster Competition (SPC). He was a J-1 Short-Term Visiting Scholar at University of Miami under a Visiting Scientist Program grant from the Office of Naval Research Global (ONRG) in 2014 working on the fusion of sonar and optical data.

In mid-2014 he joined NATO STO CMRE as a Scientist working on sonar mosaicking and the organization of marine and multi-domain robotics competitions. He has been the co-PI and deputy technical director of several competitions: SAUC-E 2014, euRathlon 2014 and 2015 and European Robotics League (ERL) Emergency 2017, 2018, 2019 and 2020 editions and the technical director of SAUC-E 2016. He has participated as a judge, invited speaker or organizer in several robotics competitions under the umbrella of the Autonomous Marine Systems (AMS) Technical Committee of IEEE OES (euRathlon, ERL Emergency, SAUVC, RobotX). He was a member of the Local Organizing Committee of the IEEE OES UCOMMS'18 conference and is the Operations Coordinator of IEEE OES UCOMMS'20. He has organized 2 Winter/Summer Schools, 4 Workshops and co-organized 9 sea trials. Fausto currently serves as a member of the IEEE OES Administrative Committee,

OCEANS RECON Committee and is also the OES Liaison for OCEANS 2023 Limerick and the OCEANS Tutorials Coordinator. Most recently, in December 2018, he earned a Bachelor in Political Science (International Curriculum) with a thesis on regulatory and liability issues of Autonomous Surface Vehicles. He is currently interested in collision avoidance regulations for unmanned marine vehicles. He serves as an Associate Editor and in the Board of Directors of Earthzine, an IEEE OES publication. He holds over 40 peer-reviewed papers, including a patent and a book chapter. He has served as a reviewer for a total of 14 journals and over 30 conferences including *IEEE Journal of Oceanic Engineering*, *IEEE Sensors* and *IEEE Robotics and Automation Letters* (RA-L). He has also contributed to 7 editions of the OCEANS SPC as reviewer or judge. His research interests include underwater computer vision, robotics competitions, educational robotics and maritime law for unmanned marine vehicles.

Statement: I have been involved with IEEE OES since OCEANS'09 Bremen. Over the years, I have attended many OCEANS and, since 2015, I have been deputy technical director of marine robotics competitions co-sponsored by IEEE OES. I am part of the Marine Autonomous Systems Competition Committee (MASC2) under the OES TC for Autonomous Marine Systems (AMS).

In 2018, I was selected to be one of the first two members of the OES Young Professionals (YP) BOOST program. This allowed me to observe better how the society works, but in 2019, I could start contributing better by serving in the Administrative Committee. In the past year, I have become the OCEANS Tutorials Coordinator helping the local Tutorial chairs and a member of the OCEANS Reconnaissance (RECON) Committee. As a RECON member, I have made the initial contact that led to OCEANS'23 Limerick for which I am serving as OES Liaison.

In a year, my volunteer activities enlarged and expanded. It is my commitment to do better if I am elected for a 3 years term. My focus will be to analyze current status and propose improvements where is possible as I did in the past for instance, for what regards OCEANS Tutorials.

I believe that, while our society and conferences are of great value, due to intense competition of other conferences, changing business models, and other factors, some challenges are coming up that we need to be ready for. First of all, we need to be relevant to the community, especially to a younger audience if we want to keep attracting new generations. Several initiatives are already in place (including SPC and YP BOOST). However, I would like to implement a couple of new ones such as job speed dating at OCEANS conferences, early career awards and others. Promoting the society and showing our value to our members is vital and I would like to help prepare corporate videos explaining what OES does and the reasons to join us. There are at the same time enormous opportunities that we should leverage on. The involvement of new YPs is bringing new people with new ideas on how to run OES. The recent increase in the number of students and student branches is excellent news. However, we need to make sure these students keep engaged beyond the first year of membership. Members are one of the strongest pillars of our society and I would like to help the Membership Development Committee design initiatives that address not only younger generations but also all members from different geographical regions and genders.

The other strong pillar of OES is our technical activities. High-level single-track conferences co-sponsored by OES or larger events such as OCEANS should attract the best research work around the globe. The model of having special issues of the Journal of Oceanic Engineering (JOE) dedicated to some of these conferences has been working very well. JOE is highly reputed and remains a top journal in the area. However, due to new trends, other models should be evaluated, such as a hybrid model with contemporaneous publishing at a conference and journal. Keeping the technical standard high should be the goal, especially in times of conferences proliferation. If elected, these two pillars will be my main concern besides my current responsibilities related to OCEANS conferences.

MALCOLM HERON (S'71-M'71-SM'93-LS'10-LF'12) was born in New Zealand. He received the B.Sc. degree in physics, the M. Sc. (first class honors) degree in physics, and Ph.D. degree in radio science, all from the University of Auckland, Auckland, New Zealand, 1965, 1967, and 1971, respectively. Between 1971 and 2007, he held several positions in physics in James Cook University, Townsville, Qld. Australia, ranging from Lecturer in Physics to Professor of Physics. He also served a term as Pro-Vice Chancellor for Science and Engineering at James Cook University (1989–1995). He was the Foundation Director of the Australian Ocean Radar Network between 2007 and 2011, and is currently the CEO of PORTMAP Remote Ocean Sensing Pty, Ltd., Queensland, Australia, and an Adjunct Professor at James Cook University. He has published more than 200 articles on radio wave propagation in the environment, physical oceanography, and mesoscale meteorology. Since 1981, his research focus has been on development and application of HF ocean radars. Through the 1990s his research has broadened into oceanographic phenomena which can be studied by remote sensing, including HF radar and salinity mapping from airborne microwave radiometers. Throughout, there have been one-off papers where he has been involved in solving a problem in a cognate area like medical physics, and paleobiogeography. Occasionally, he has diverted into side-tracks like a burst of papers on the effect of bushfires on radio communications. Prof. Heron is a Fellow of Engineers Australia. He has served on multiple committees in the Northern Australia Section of the IEEE and is the Foundation Chair of the Australian Chapter of the IEEE Oceanic Engineering Society. He was an Elected Member on the AdCom of OES in 2006–2011 and 2014–2016, and served on several associated committees. He was the Associate Editor of the *IEEE Journal of Oceanic Engineering* (1986–2009), and was a Guest Editor for a Special Issue of the Journal in 2006.

He is currently OES VP for Technical Activities (2017–20), member of the OTC Asia Oversight Committee, and member of the IEEE Corporate Innovation Award Committee (2020).

Statement: The Oceanic Engineering Society has done well with its Strategic Planning and Implementation over recent years and the new Strategic Goals for 2020–2022 will confirm those solid directions. My role if elected would be to support the implementation of that plan. In particular, I would work with the incoming VPTA to provide a clean and supportive handover. The participation of OES in the Decade of Ocean Science and joint activities with other societies needs work in the next few years. This is linked to the strategic need to create operational collaborations across the Technology Committees in running workshops/symposia. At the moment this falls across VPTA and VPWS areas. For long-term viability it is important to have AdCom members actively supporting the OTC series in Houston, Asia, and South America. OES needs to recruit more of its members into active and supportive roles in OTC. Each and every member of AdCom should have a clearly define role in OES with reporting lines through the VPs. This may seem simple and intuitive, but the reality is that ex officio members of AdCom (being Chairs of Committees etc) have defined roles but this is not mandated for elected members. This is a problem for the dynamics of OES.

KATSUYOSHI KAWAGUCHI (M'96) was borne 1964 in Tokyo JAPAN. He took a Ph. D from Tokai University in 1993. He is currently a director of Engineering Department JAMSTEC and visiting faculty member of Center for Integrated Underwater Observation Technology, Institute of Industrial Science, the University of Tokyo. As the OES activity, He served as vice Chair of OES Japan Chapter 2014–2015 and has been Chair of OES Japan Chapter since 2016 to present. During this period, he acts as a TPC Co-Chairs at several international conferences co-hosted by the IEEE OES such as Techno-Ocean 2014, Techno-Ocean 2016 and OCEANS'18 MTS/IEEE Kobe/Techno-Ocean 2018 (OTO'18). His devoted promotion, mainly in Asian region, made the OTO'18 a great success, gathering the largest participants and papers in the history of the OCEANS conference. As for the activity to be done in the future, he will be hosted International Symposium on Underwater Technology scheduled to be held in Tokyo in 2021 (UT21) as General Co-Chairs. His research interest is real-time seafloor observatory development. He has served as an engineering director of DONET during the past for 15 years. DONET is a submarine cabled observatory development program for megathrust earthquake disaster mitigation started from 2006. His team developed cabled observation system and carried out the construction using ROV with special modifications. The program spends a decade to construct two backbone cabled systems, 51 earthquake and tsunami observatories, and two bore hole observatories. The development stage of DONET was completed March 2016 and change over to practical use. The information from the seafloor is utilized for an earthquake early warning system and tsunami forecast of the Japan Meteorological Agency. Based on these research activities, he is conducting UT piggybacked international symposiums called Scientific use of Submarine Cables and related technologies (SSC) to enhance international cooperation in this field. Such activities have led to the use of OES as an international venue for discussing the scientific use of submarine cables.

In 2016, He formed a Shell Ocean discovery X-prize competition (AUV competition) team "team KUROSHIO" as an advisory board member and led the team to the second place in final round 2018. The team consists mainly of young researchers from research institutes, universities and companies in Japan, and its core members belong to OES/OES Japan Chapter. Taking this opportunity, He designed a system in OES Japan Chapter to support young members in the chapter participate in the competition. Such efforts are expected to be effective in motivating society activities by young researchers.

Statement: Since becoming a member in 1995, I have used OES as a point of contact for international information sharing on ocean research and development. I am very favorable to the society's policy of discussing engineering to support the scientific research of the oceans. I will stand for the candidate to pass on this benefit from the OES to the new generation in a new way.

If I become a committee member, I would like to recommend the following:

1) Building a strong framework for international corroboration of scientific use of submarine cable and related technologies.

   Several national projects have been held around the world for observations using submarine cables technologies, which are my background, but it is expected that international utilization will expand in the future, both technical point of view and the perspective of data utilization. In order to fully utilize the basic capabilities of the submarine telecom cable system, a system that connects countries, I want to create a team where stake holders from each country can participate and discuss international standardization and research collaboration.

2) Responding to environmental changes surrounding OCEANS conference in Japan.

   Over the last decade, I feel that the general value standards of conference and exhibition have changed. OTO18 was a success but I think it will be difficult to hold OCEANS conferences in the same format as last time in Japan in the future. To thinking of holding a OCEANS conference again in Japan. I would like to discuss the creation of added value through reorganization of conference management, such as digitizing conference materials, holding workshops, town hall meetings, and clear handling of peer review papers and technical materials to fit for local manner to creating an environment where domestic stakeholders can participate.

3) Improving motivation for society activities.

   In order to secure young society members, we need to increase the value of membership in a visible way. Competition

support program in Japan Chapter is first step of the approach. I would like to expand these initiatives not only to robot competitions, but also to the measurement accuracy of instruments, proposals for solutions to problems and so on. I will consider services that young researchers find attractive at the society level and how to distribute such information. Focusing on these three items, I would like to proceed with the discussion so that OES can be the most attractive society in oceanic engineering.

MICHAEL LAMOUREUX (S'95-M'99-SM'09) is Spend Matters Consulting Lead Analyst on Strategic Procurement Technologies and Advanced Technology Applications. As an expert in Algorithms, Analytics, and Optimization for Global Supply Chains, he's primed to evaluate, and advise on, the most advanced and innovative software applications on the market today. He's also a scholar, researcher, solution engineer, optimization guru, writer, vagabond, leader, futurist, anti-prophet, and "the doctor" of Sourcing Innovation—one of only two blogs that has been covering the Sourcing and Procurement Supply Chain subspace for over a decade!

He's been leading innovation in web technologies, e-Commerce, e-Procurement, Optimization, Analytics, and even AI for the last two decades in various roles which have included Chief Architect, Chief Research Scientist, CTO, Assistant Professor, Blogger, and Technology Analyst. His PhD in Computer Science combined with his deep industry background and extensive knowledge about Supply Management gives him unique insights into not only what is driving innovation today but what will be driving innovation tomorrow, which have allowed him to write foundational white papers on the core technologies in his area, usability, and AI.

He currently lives on the east coast of the Great White North (which is what is officially called Canada), in a place call Halifax that sits smack dab in between the West Coast of the US and the UK (and lives in a time zone that seems to be foreign to the rest of the world that thinks time jumps from North American Eastern Time to Greenwich Mean Time).

Statement: We all know that when it comes to volunteer support, societies have gotten the short end of the stick for decades in IEEE. I want to change that. As a volunteer who fought for years for better tools to support unit operations, guided their creation when I finally got the chance, and who has deep insight as Past MGA Vice Chair IT, I know that now that we have some relatively modern platforms in place, with the right support, we can do better for everyone, not just sections and regions.

As a professional who is also very interested in the advancement of key disciplines relevant to my work—mathematical modelling (for finance chains), information science (for information chains), and, most importantly, oceanic science (as the vast majority of supply chains are powered by the oceans)—it's imperative that our societies be able to operate as efficiently as possible so we can spend less time on overhead and more on the advancement of sustainable oceanic science below and above the surface. [And very few societies are in the position to build their own solutions.] My goal is to capture the operational needs of the Oceanic Engineering Society [which is a prime example of a key, but under-supported society] from an IEEE perspective, determine how existing IEEE processes and platforms could be improved to support (rather than impede) them. I will work with TAB, MGA, and IT to not only convey these needs but see that they are addressed, with the appropriate priority and funding, over time. And in doing so allow the rest of the Oceanic AdCom and ExCom to focus on growing the society, having great conferences, and advancing new initiatives without being held back in IEEE operational drudgery.

ANDREAS MAROUCHOS (M'10) Andreas is a Principal Research Engineer and Research Group Leader in the Engineering and Technology Program in the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Oceans and Atmosphere (O&A) business unit. He provides engineering and technical support to scientists and industry working the marine and atmospheric domains. In addition to providing technical guidance in the deployment of projects, Andreas and his group specialise in the design of bespoke science systems and platforms. This includes the design and manufacture of ship-based systems and instrumentation, autonomous platforms, and oceanographic moorings. In addition, Andreas is involved the development of novel technologies and methods to meet present and future engineering challenges. The Engineering and Technology program has a strong track record for delivering technical solutions to address challenging science problems in the field. Andreas also leads domestic and international collaborative efforts on technology development with a variety of research partners specifically targeted towards addressing fundamental technical and operational challenges in the advancement of ocean observing science platforms. The fields of study include ocean science and monitoring, mooring development, advanced materials, system autonomy and environmental technology to support aquaculture science and industry.

Andreas' technical background includes a broad range of engineering fields including aerospace, aerostructures, technologies for the environment, audio-visual engineering, optics, ocean engineering, autonomous systems and engineering systems modelling and simulation. Andreas has worked with a wide range of research and industry institutions including the University of Toronto, Boeing Aerospace, IMAX and CSIRO.

Andreas is active in both the IEEE Ocean Engineering Society and the Marine Technology Society. Andreas is the Tasmanian sub-section chair in the Australian Chapter of the IEEE Ocean Engineering Society and actively engages the extensive marine technology community in Tasmania with talks and supporting visits from field experts. Andreas is also the Chair of the OES Polar Oceans Technical committee and

has been active in the planning and execution in a series of technical workshops on polar technology development. The third event in the series, the Antarctic and Southern Ocean Forum for Science and Technology (ASOF-Fest) workshop is scheduled for August 2020 and will bring together researchers across both science and technology domains to discuss emerging challenges in conducting southern-ocean research. Over his ten years working in the marine industry Andreas has also regularly attended and presented papers at IEEE Oceans conferences (over 16 in 10 years).

Statement: As we move into the next decade designated by the UN as the Decade of the Oceans we are poised to see significant change in the method and technologies being deployed in our oceans. The operational challenges of localisation, persistence and scale faced by the marine sector will become more acute as operations of all sorts venture into more remote regions, deeper waters and further off-shore. Autonomy is the future of ocean operations. Advanced unmanned platforms working both at the surface of the oceans and below, combined with advances in machine learning and sensor technology will change the way ocean operations are conducted in support of both research and commercial activities. These technology drivers will demand new engineering skills, legal and regularity frameworks, business models and standards and the next generation of marine and ocean engineers will need to embrace a new set of skills to succeed.

The Ocean Engineering Society (OES) has the opportunity to play a central role in helping enable and lead this change but not without challenge. Engineering activities in the sector will become increasingly multidisciplinary and requiring a more diverse set of skills. Interactions between disciplines are also likely to become more nuanced and require the creation of new sub-disciplines in engineering curricula. This presents an opportunity for OES is to help engage with students and emerging engineers in the field helping to provide a framework (and subsequently a home) for new members who may increasingly find their new skills at odds with traditional marine engineering curricula. Continued investment in student engagement though workshop and conferences is critical in this regard.

As part of the IEEE, OES in in the unique opportunity to provide guidance on setting of standards and contribute to the development of best practice and subsequent discussions informing regulatory frameworks. This is particularly necessary in the context of autonomous or unmanned systems. Outside of the engineering discipline, OES has an opportunity to engage with the broader science community to create strong working groups around key science theme areas; helping break free the constraints of siloed expertise in particular domain areas and encourage interaction and idea sharing across disciplines. An example of this is the Antarctic and Southern Ocean Forum which mixed science presentations with engineering discussions around the challenges faced by conducting science operations in the Southern Ocean. Is it envisioned that along with its sister conference (the Arctic and Northern Ocean Forum) that bridges could be formed by specialist groups working at opposite poles to address often similar technical challenges.

FREDERIC MAUSSANG (M'08-SM'19) is an Associate Professor of Mathematics and Signal Processing at IMT Atlantique, a French College of Engineering in Brest, since 2007. His research interests include signal and image processing for detection and recognition in oceanic environment. In 2005, he received his Ph.D. from Grenoble Alpes University in Signal, Image, Speech, and Telecom for his work in image processing and data fusion on underwater acoustical images to detect buried objects in the seabed. He obtained in 2002 a M.S. in Electrical Engineering from Grenoble INP, France.

His activities at IEEE OES have been continuously growing since his membership in 2009, firstly as a reviewer for the *Journal of Oceanic Engineering* and for OCEANS conferences, then for OCEANS Student Posters selection, and as member of IEEE/OES conferences organizing committees. He served, for example, as Tutorials Chair for OCEANS 2019 Marseille.

His involvement took on another dimension when he became OES Young Professionals Rep. in 2015. He organized YP meetings at OCEANS conferences. He established the YP-BOOST program in 2017 allowing OES YP members to be involved in the OES organization. Since its creation, 8 YPs benefited from this program and participated actively, and freely, to the OCEANS conferences (Students Posters competitions jury, organization…), and 2 of them continue to be active as members of the AdCom.

Statement: As described above, I've been actively involved with various IEEE and OES activities. I've particularly observed the interest these societies can bring to students and young professionals during my activities for Student Poster competitions and YP representation. However, even if OES recruits relatively easily among these people, there are difficulties to keep them for a longer period of time, particularly when they find changes in their job and life.

The goal of the YP-BOOST program is to answer, partially, this problem, by including YPs in the OES activities, with the hope they continue to contribute to the OES afterward. Even if this program is too young to have real conclusion, we have observed an increase in YP membership.

In the future, we need to go further on this subject allowing developing member's loyalty. For that, I propose to involve YP-BOOST laureates, former laureates, and other student and/or particularly active YP OES members in a mentorship program aimed to new student and YP members. This program could include online courses, vlog (video blog)… and a more precise monitoring for new members to inform them of OES activities or opportunities to encourage them to renew their membership. This mentorship needs to be made also, in order to balance membership into IEEE regions and to increase the number of female members for a better gender equality.

SULEMAN MAZHAR (S'08-M'10-SM'14) is an IEEE senior member and earned his PhD from Tokyo University (2009) and a postdoctorate from Georgetown University (2010). Currently he is working as faculty member at CS department, Information Technology University, Lahore. His research interests are in ICT based solutions for environmental and development related challenges, especially in a developing world context. He has worked on a number of projects as principle investigator of BiSMiL Lab. Currently, he works on conservation of Indus river dolphin and environmental monitoring of dolphin habitat and has previously worked on humpback whales and the bottlenose dolphins. He is alumni of Japanese Monbukagakusho program and US State Alumni (NIH fellow and a Fulbright grantee). He has got an extensive experience in mentoring both undergraduate and graduates students as a faculty member at famous technology universities in Pakistan and as a postdoctoral fellow at the University of Tokyo (Japan) and the Georgetown University (DC).

IEEE ACTIVITIES:

1) IEEE senior member
2) Member of Ocean Engineering Society and Signal Processing Society
3) Social media activities volunteer at IEEE Oceans, Kobe 2018
4) Conference publications at IEEE Oceans (2018, 2008, 2007), IEEE ISBI 2018, IEEE VTC 2018, IEEE IPSN 2018, IEEE Sensors 2015, IEEE PerCom 2019

ACTIVITIES IN OTHER PROFESSIONAL ORGANIZATIONS:

Acoustical Society of America (2014 till to-date)

Qualifications & Academics Experience:

- PhD, Environmental & Ocean Engineering, the University of Tokyo
- Postdoc. Fellow, Georgetown University, Washington DC, USA
- Assistant Professor, GIK Institute, Topi, KP, Pakistan
- Currently: Assistant Professor, CS Department, Information Technology University, Lahore, Pakistan

Statement: I have been a member of IEEE for the past 13 years and a senior member since 2013. Since 2006, I have been participating in society activities through annual IEEE OES conference and lately through student activity committee. During my PhD at Tokyo University, I happened to observe active participation of my advisor (Professor Ura) and lab colleagues (Sugimatsu san and Prof. Asada) in OES activities. During this period, I got excellent learning opportunities from the platform of IEEE OES and also happened to serve in my humble capacity. I have participated in a number of Oceans conferences as an author and a technical paper reviewer.

If elected as a member of AdCom, I would like to expand our activities in young professionals and students, to increase our membership. I shall be interested in contributing to social media and website related activities of the society so that we can effectively use these tools to attract a diverse and broader international audience and to expand our outreach and public activities. Currently, as a researcher, I am studying Indus river dolphins and initiating a new bio-acoustics monitoring program in coastal zone of Arabian Sea. In my capacity as PI and Co-PI of different relevant projects in this area, I am administering a cumulative grant of more than 180,000 USD (funded by grant organizations in Pakistan, Germany and China). In this capacity, I can also help in extending presence of IEEE OES in China, Germany, South Asia and Middle-East region. In particular, as I shall be visiting Harbin Engineering University and Jacobs University Bremen, as a visiting researcher, during the next year, I look forward to actively engage student and faculty body at both places, in IEEE OES activities.

As someone who happened to witness endeavours by OES team for encouraging young professionals and students, while participating in the social media coverage activities at Oceans 2018 (Kobe), I feel excited to join the OES administrative committee to play an active role in society representation and activities at large. I hope that proposed nomination in AdCom will enable me to contribute in day to day business of the society. I hope that given my academic background and working experience of the East (Asia) and the West (Europe & USA), I shall be able to bridge between different kinds of poles within which our society operates (students & professionals, developing and developed countries, experienced ones and the YPs).

ROSMIWATI MOHD-MOKHTAR (S'03-GSM'06-M'08-SM'14)

1) Age: 45-years old
2) B.Eng. (Hons) Electrical & Electronic Engineering (USM); M.Sc. Electrical & Electronic Engineering (USM); Ph.D. Electrical Engineering (RMIT)
3) P.Eng. Electronic (Board of Engineers Malaysia, BEM); C.Eng. Institution of Engineering & Technology (IET), UK; Member (MIEM) Inst. of Engineers Malaysia
4) Universiti Sains Malaysia (2008-Current)
   - Associate Professor at the School of Electrical and Electronic Engineering, Universiti Sains Malaysia.
   - Mechatronic Programme Chairman at the School of Electrical and Electronic Engineering, Universiti Sains Malaysia. (2016–2021)
   - Published more than 80 papers in journals and conference proceedings.
   - Research interest in system modelling & identification, control system design, robotics, mechatronics application, underwater system modelling and control
   - Advisor of IEEE USM Student Branch Women in Engineering Affinity Group (Since 2017)
   - Counsellor of IEEE USM Student Branch (2013–2016)
   - Coordinator for Underwater Control Robotics Research Group (UCRG) (Since 2014)

5) Secretary IEEE Malaysia Section (2019–2020)
6) Executive Committee, IEEE Malaysia Section (2017)
7) Executive Committee, IEEE Control System Society Malaysia Chapter (2013–2014), 2016, 2018–2020.
8) Secretary, IEEE Oceanic Engineering Society (OES) Malaysia Chapter (2015–2018)
9) Vice Chair, IEEE Women in Engineering Malaysia Section (2018)
10) Chair, IEEE Women in Engineering Malaysia Section (2019–2020)
11) During tenure as counsellor and advisor to IEEE USM SB & IEEE USM WIE AG, I have successfully brought the team in achieving
    - Best Student Branch Award (Small Category)—IEEE Malaysia Section (2013)
    - 2nd Best Student Branch Award (Large Category)—IEEE Malaysia Section (2014)
    - Outstanding Branch Counsellor Award—IEEE (2014)
    - Silver Darrel Chong Award—For "Techmentor—Arduino Volunteer Teaching", IEEE (2015)
    - Outstanding Student Branch Award—IEEE Malaysia Section (2015)
    - 1st Place IEEE Student Branch Website Competition—IEEE Region 10 (2015)
    - 3rd Place IEEE Student Branch Website Competition—IEEE Global (2015)
    - Gold Darrel Chong Award—For "Tech Mentor Project", IEEE (2016)
    - 1st Place IEEE Malaysia Infographic Competition—IEEE Malaysia Section (2016)
    - IEEE Region 10 Educational Activities Outstanding Volunteer Award—IEEE Region 10 (2017)
    - R10 Women in Engineering Outstanding Student Branch Affinity Group Award—IEEE Region 10 (2019)
12) Organizing Committee (Secretariat for National Technical Seminar on Underwater System Technology (2010–2011, 2013)
13) Organizing Committee (Secretariat) for Int. Conf. on Underwater System Technology: Theory & Applications (2010, 2012, 2014, 2016–2018)
14) I undertake to attend standing committee meetings if I am elected.
15) I accept responsibility for the full accuracy of the particulars stated above and agree that the validity of my nomination shall depend upon the accuracy of such particulars.

Statement: IEEE Oceanic Engineering Society is a very exclusive society concentrating on man who involved themselves in the field of interest related to water, the system and the technology. In comparison to other established society under the IEEE, this society may have fewer number of members in due to the nature of very specific focus area of interest. Involved during the establishment of the IEEE OES Malaysia Chapter back in 2015, below are the challenges that we faced with the society.

a) Not many members involved in the field of oceanic engineering in Malaysia
b) They have already subscribed to few other societies already (which is more general and wider scope).
c) Retaining the member. Only those who are committee members dare to renew. If they are not, then they won't renew the membership.
d) Financial constraints of paying the registration fees.
e) Despite the challenges as mentioned, there are still room for opportunities that we can consider and help to instill the same vision to others.
f) The research and activities within this area is very challenging and there are a lot more to discover. Engagement with people within this area will give a lot of advantages.
g) Conference, competition event etc. with special fees rate for OES members will attract more people to register and become member.
h) Communication and information are now at finger tips. Thus, re-strategize to be more approachable and known to others must be made.

"Life is about accepting the challenges along the way, choosing to keep moving forward, and savouring the journey." Roy T. Bennett

The quote is really meaningful and inspiring for us to face the challenges, no defeat and no surrender, keep looking for opportunities and continue on treasuring the journey in this life. With that, there are several steps that can be taken by the IEEE OES as to advance the society.

a) Provide more activities where benefits and discount be given to those registered as IEEE OES member/student member. Currently most event give privilege to IEEE member only, which means they have to register as IEEE member only without need to register for the technical society.
b) Improve visibility of the IEEE OES to the world. Find platform where many people will read it and showcase who we are.
c) Based on the member that registered to IEEE OES, identify potential member of every country and appoint them as subcommittee (ambassador) to expand and make a progress in their country.

VENUGOPALAN PALLAYIL (S'90-A'99-M'99-SM'04) has a post graduate degree in physics (1981) and a PhD in Microwave Electronics (1992), both from Cochin University of Science & Technology, India. Ironically, he ended up working in the field underwater acoustics and marine technology for the past 33 years. He spent about 11 years as an R&D Scientist at the Defence Research and Development Organisation in India before moving to Singapore in 1998. He currently works as a Senior Research Fellow at the National University of Singapore (NUS).

He made major contributions to the field of air-borne ASW sensor systems such as active sonobuoys and helicopter sonars, while working in DRDO. In Acoustic Research Laboratory (ARL), NUS, he has been responsible for the successful completion of many projects, and one of the projects, ROMANIS, won the

prestigious Singapore Defence Technology Prize in 2004 for the best Group Project. Currently he is leading the research activities on the development of lightweight towed arrays for underwater applications using AUV and USV platforms. His research work on thin line towed arrays has resulted in many collaborative experiments with internationally reputed organizations such as Scripps Institute of Oceanography (USA), CMRE (Italy), DRDO (India), ATLAS Electronik (Germany), University of Texas (Austin) and lately with Woods Hole Oceanographic Institute (WHOI), USA. As part of these collaborations he also made many scientific cruises. Apart from intense research activities, he also supports the lab as a Deputy Head, helping out the head of the lab on many fronts such as research staff recruitments and project management. He served as the Manager for Operations for the Tropical Marine Science Institute, for 5years, and in this capacity he had been helping out the Director of the Institute on the administrative matters related to finance and facility management. He has also been a reviewer for many reputed journals like JoE (IEEE OES), Ocean Engineering (Elsievier), JASA and nearly half-a-dozen international conferences.

IEEE OES and other professional engagement: Venu has been a member of IEEE for the past 23 years and was elevated to Senior Member grade in 2004. He played a key role in setting up the IEEE OES Singapore Chapter in 2002 and served in various capacities such as its Chair, Vice-Chair and Treasurer. He continue to volunteer as an Executive member and mostly in an advisory role. He served on the organising committee for OCEANS'06 Singapore as Chair for Finance. He served as the Co-Chair and Chair for sponsorship for the first ever Singapore AUV competition (SAUVC 2013) and served as General Chair for the SAUVC 2014 event. Since 2013, he generates about $40K on average every year through sponsorships for the smooth running of the SAUVC competition. This competition has now become one of the leading events in the Asia, attracting over 300 students every year. He served on the committee for Marine Autonomous Systems Competitions Coordination (MASC2) that is working globally to standardize student AUV Competitions. Volunteered as the IEEE OES Sub-Committee member for the OTC-Asia 2014 and OTC-2016 and also as chair for the IEEE OES programme sub-committee, OTC Asia 2018. He first served on the IEEE OES AdCom in 2016 and supported the membership development programme. He has also been serving as an AdCom member for the period 2018–2020 and is now seeking a re-election for 2021–23. He is a contributing editor for the BEACONS Newsletter and regularly contributes articles. At present he is spending most of his volunteer time for the organisation of OCEANS 2020 Singapore. As member of the JOAB, he extensively participates in its (offline) meetings and discussions and offer valuable inputs on the conference operational matters. As a Liaison for the OCEANS 2022 India, he regularly works with the LOC in India organising meetings and site visits to alternative conference venues and reports to JOAB. As a recognition of his services to the Society, Venu received the IEEE OES Presidential Award in 2018. He has a presence in other local and international scientific organisations such as Society of Acoustics, Singapore, International Institute of Acoustics and Vibration (IIAV), USA and Marine Technology Society, USA. He served as Chair for exhibition for the Western Pacific Acoustic Conference (WESPAC) held in Dec 2015 and organised by the Society of Acoustics, Singapore. He also organised and chaired an underwater acoustics session for WESPAC 2015. He supports various OES sponsored conferences such as UT and USYS as reviewer, session chair and also as keynote speaker.

Statement: 23 years of my association with IEEE and OES has provided me ample opportunities to volunteer and contribute to the objectives of the Society. The various activities listed above speaks about my dedication and commitment as an IEEE OES volunteer. Being an AdCom member has provided me great opportunity to work closely with the society leadership and gain support for various OES initiatives such as the SAUVC. The SAUVC events have helped to grow the membership, member engagement as well as to reach out to the students in a better way. I am also proud to see that many young members from Singapore Chapter has come to the forefront to serve the Society in various leadership roles such as Young Professionals, web development and Earthzine editor roles. I can claim that I have played a part in this development and believe that engaging them in the organisational matters of the society would be a key to build a better future for the Society and its activities. I propose to work with the chapters in the region to promote and jointly organise events. If elected for the class of 2021–23, it would provide continuity to my mission and generate better results. I believe with the valuable experience and knowledge that I have gained over the past three years as an AdCom member, I could contribute more to the AdCom to fulfil its obligations. I am also willing to take up more organisational roles, if there is an opportunity.

GEORGIOS SKLIVANITIS (GSM'11-M'16) received the Diploma degree in electronic and computer engineering from the Technical University of Crete, Greece, in 2010, and the Ph.D. degree in electrical engineering from The State University of New York at Buffalo in 2018. He is currently a Research Assistant Professor with the Department of Computer and Electrical Engineering and Computer Science, Florida Atlantic University. His research interests span the areas of signal processing, software-defined wireless communications and networking, cognitive radio, and underwater acoustic communications. In 2014, he was the first finalist and was a recipient of the 2014 Nutaq Software-Defined Radio Academic U.S. National Contest and in 2015 the 10th ACM International Conference on Underwater Networks and Systems Best Demo Award. He was also a recipient of the 2015 SUNY Buffalo Graduate Student Award for Excellence in Teaching, the 2016 SUNY Buffalo Student Entrepreneur Fellowship, and the 2017 SUNY Chancellor's Award for Student Excellence.

Statement: I am very interested in participating and actively engaging with the leadership of the IEEE Oceanic Engineering Society by getting involved with technology committees on *Underwater Communication, Navigation and Positioning, Autonomous Maritime Systems (AMS)* and standing committees on *Membership Development, Workshops and Symposia, and Technology Committee*.

In particular, I look forward to supporting VPTA's efforts to increase activity in the *Underwater Communication, Navigation and Positioning, Autonomous Maritime Systems* Technology Committees by organizing special sessions and tutorials in upcoming OES-sponsored conferences (e.g. UComms, OCEANS, UACE, and the Autonomous Underwater Vehicle symposium) and supporting Special Issues of the OES Journal of Oceanic Engineering on cognitive localization for underwater acoustic networks and communication-based navigation methods for swarms of low-cost autonomous underwater vehicles. If given the opportunity, I would be delighted to be part of VPTA's effort to take action and lead OES activities for contributing to science-informed policy responses to global ocean change as part of the United Nations Decade of Ocean Science for Sustainable Development (2021–2030). In parallel, I look forward to engaging, at any capacity, with the members of the AMS technology committee to integrate the role of underwater wireless communications and networking into existing educational activities of AMS (e.g. European Robotics League, Student AUV, Singapore AUV Challenge).

As an AdCom member, I would be delighted to contribute to OES membership development for the next three years and help with the organization of student poster/paper competitions and other technical as well as new entrepreneurship-related activities (e.g. with the organization of small 2-day hackathons, lightning talks and 3minute pitch competitions in upcoming OES-sponsored conference venues). I am confident that getting involved with OES workshops and symposia will give me the opportunity to get exposed to a significant body of research work as well as connect and receive feedback from fellow colleagues that lead the ocean engineering and oceanographic communities.

I strongly believe that creating and growing an evidence-driven community of underwater wireless and autonomous systems experimenters with a shared culture and high standards starting from undergraduate and graduate students will be imperative for the future of oceanic engineering and undersea seafloor science. As a result, I look forward to actively participating in ongoing activities and current developments for underwater acoustics standards as well as getting involved with the OES interoperability standards initiative for the marine environment.

In summary, I believe that serving to the AdCom Class of 2021 will be an important catalyst for my professional career as an oceanic engineer and benefit my research progress over the next three years.

If you have any questions about the IEEE Oceanic Engineering Society voting process, please contact **ieee-oevote@ieee.org** or +1 732 562 3904.

Welcome New and Reinstated Members

Australia
John A Risson

Canada
Sam Decosse
Bruce Gordon
Joseph Martin

China
Zhou Quanbin
Chi Wu

Colombia
Jeisson Alexander Giraldo Tique

Ecuador
Angelica Maria Bustos Ona
Gema Maria Camacho
Yomaira Yuliana Mera Romero
Karen Michelle Miraba Penafiel
Jessica Alexandra Palate Cagua
Ivanna Del Rocio Ramos Castaneda
Josseline Nicolle Sanunga Loayza

Hong Kong
Jacky Liang

India
Sindhu Gaddam
Leibinitz Asariparambil Thomas

Israel
Itzik Klein

Italy
Michael Alibani
Vincenzo Piscopo

Japan
Yukitoshi Ogasawara

Korea(South)
Jongdae Jung

Netherlands
Aneesa Abbasi

New Zealand
Muhammad Salman Rashed

Norway
Tor Inge Birkenes Loenmo

Pakistan
Muneeb Abbasi

Russia
Nikolay Aleksandrovich Grekov
Igor B Shirokov

Serbia
Pavle Petrovic

Taiwan
Jenn-Shyong Chen

Ukraine
Evgen Dykyi

United Kingdom
Amin Deraz Nasr

USA
Mark Bednarczyk
Samantha Bowman
Philip W Criswell
Ayse Kalkan-Savoy
Nathan Laxague
Landon Cole Lindsay
Karina Paz
Mehdi Rahmati
Brandon Sackmann
John Edward San Soucie

Trajectory of the Team Clairvoyance

Kenichi Fujita, Yuya Hamamatsu and Hiroya Yatagai (The University of Tokyo)

The "Team Clairvoyance," the student team from the University of Tokyo for underwater robot competitions, got the Dean's Award, Graduate School of Frontier Sciences. This is the story of what we did this year. Enjoy the story!

1. Introduction

"Team Clairvoyance" consists of master course students in the Maki Laboratory, Institute of Industrial Science, the University of Tokyo. The goal of our team is to learn and develop underwater technologies, especially for Autonomous Underwater Vehicles. To achieve this goal we participated in the underwater robot competitions and learned engineering skills through communications with students from overseas. In addition to just joining the competitions, we also presented, what we felt and what we learned at the competitions, at a domestic forum supported by IEEE/OES Japan chapter.

Our graduate school recognized our efforts and gave the Dean's Award to us at the degree conferral ceremony held on March 23, 2020. Here, we would like to introduce our team and some of the achievements.

2. The Origin of the Team Name

The word "clairvoyance" is defined as "the power to see the future or to see things that other people cannot see" in the Cambridge dictionary. We named our team "Team Clairvoyance" for the following two reasons. First, we wanted to make an AUV that accurately analyzes and navigates its surroundings, even in underwater environments where visibility is poor. Second, the word clairvoyance happens to be the direct translation of the name of one of Japan's most famous and delicious ramen shops, Ramen Senrigan (千里眼) (Figure 1), which is just 5 minutes apart from our laboratory. The noodle encouraged our daily activities a lot and we like it too much.

Figure 1. Ramen Senrigan [1].

3. OTO'18

Team Clairvoyance attended the two major events, OTO'18 and SAUVC 2019. First, we would like to explain about OTO'18(OCEANS'18 MTS/IEEE Kobe/Techno-Ocean) [2]. Shortly after starting our master course, we competed in the OTO'18 Underwater Robots Competition (AUV class) in Kobe, Japan. In this competition, three teams competed: a team from the Kyushu Institute of Technology, a team from Kyushu Polytech, and us. In this competition, the teams competed for the achievement of the eight missions and required time. Figure 2 shows our AUV 'Minty Roll' at one of the missions. The missions are as follows:

1) Unattended launch.
2) Passing through the gate
3) Landing
4) Dropping the weight
5) Touching the buoy
6) Approaching the target
7) Homecoming.
8) Unattended recovery

Although it is evident that using expensive equipments such as DVL makes the challenge easy, we have focused on navigation using inexpensive equipment such as IMUs and cameras. Our AUV (Minty Roll, Figure 3) behaved consistently without major problems and won the first prize in the competition.

4. SAUVC

After winning at OTO'18, our focus moved to SAUVC (Singapore Autonomous Underwater Robots Challenge), one of the

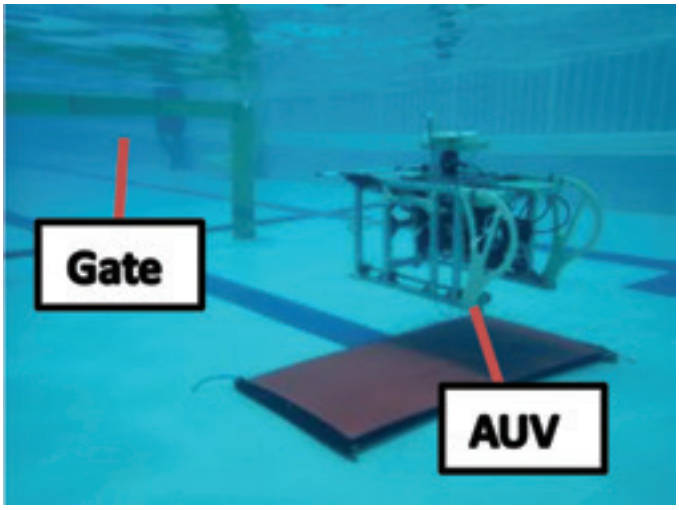

Figure 2. Our AUV passed through the gate [3].

Figure 3. Our AUV 'Minty Roll'.

Figure 5. Qualification round [3].

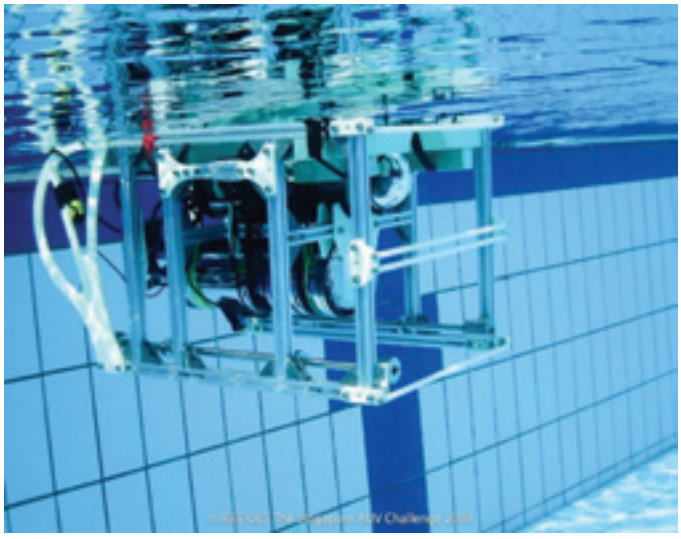

Figure 4. Our AUV in the first round [3].

Figure 6. Technical exchange with overseas team.

major international competitions of underwater robots. It did not take a long time to decide to participate in the competition. We were eager to join SAUVC, but at that time, we did not have enough funds. We had started to give up on joining the competition when, fortunately, the OES Japan chapter started a scholarship for SAUVC. We applied for the scholarship and were finally selected. We would like to say a big thanks to the OES Japan chapter. SAUVC consists of three rounds. The first round was a video review of the AUVs to see if they worked correctly. 61 teams applied to the first round and 15 teams were selected. Our team made it through this and was qualified to join the second round held in March 2019 in Singapore. A lot of our efforts went to improve the stability of the control, making use of our experience in OTO'18. In the second round, the time to get through the gate was contested. Each team put their effort to reduce the time to get through the gate. Our AUV was able to pass through the gate, but not fast enough to advance to the final round (Figure 4, Figure 5).

Our failure in the second round partly comes from a strategic mistake. We paid more attention to stabilization of the ccontrol than the speed of the AUV. The shape and weight

Figure 7. Undersea Engineering Forum zero [4].

of our AUV was not optimized for speed, although it was well designed for stable control. This was our first time participating in the SAUVC and breaking through the first round as a Japanese team. We learned a lot from other teams. We had a lot of chances to actively ask questions about other teams' technologies. It was a very valuable experience for us (Figure 6).

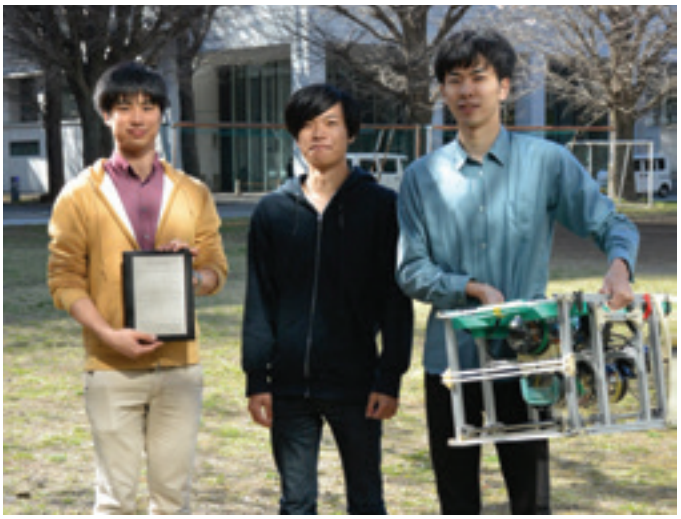

Figure 8. Photo with the award.

After coming back from SAUVC, we shared what we have learned through these experiences, for example through OES BEACON and a domestic symposium [4] on underwater technology held in fall 2019 (Figure 7). We strongly believe that our experience is helpful for future challengers for SAUVC and other underwater robot competitions.

5. Conclusions

In recognition of these achievements, we won the Dean's Award from the Graduate School of Frontier Sciences of the University of Tokyo (Figure 8) for our significant contribution to international exchange through technical exchanges through the underwater robot contests. We hope our activities encourage Japanese students and researchers to deepen their interest in underwater robots.

6. Acknowledgments

The authors would like to thank Prof. Toshihiro Maki, Institute of Industrial Science, the University of Tokyo, and Ms. Harumi Sugimatsu, OES Japan chapter for their support for our activities.

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New Phyto-Finders Tackle Improvements for Better Phytoplankton Sampling

Lexi M. Foster, Phyto-Finder, First Flight High School, Kill Devil Hills, North Carolina USA

First Flight High School (FFHS), located on the barrier islands of North Carolina, sets a high bar with their Phyto-Finders Club. Club members take advantage of their unique location and resources by collecting phytoplankton with a student-designed and student-fabricated tow frame, which they deploy along local piers. Their main objective is to detect toxic algal blooms, which are a threat to human and ecosystem health. When examining their samples using microscopes and through DNA analysis, the Phyto-Finders are able to detect harmful organisms, such as *Pseudo-nitzschia*, which can produce domoic acid, a potent neurotoxin. Their results are reported directly to the National Oceanic and Atmospheric Administration (NOAA) Plankton Monitoring Network (PMN). This school year (2019–2020), the club has an almost entirely new team with creative ideas to improve the capabilities of the tow frame.

I. Introduction

In the beginning, 2005, as the Phyto-Finders Club first began to take shape, collecting phytoplankton was as simple as dropping a net at the US Army Corps of Engineers Field Research Facility (FRF) pier in the town of Duck, NC, or at Jennette's Pier in the town of Nags Head, NC. This technique had some flaws, mainly the inability to control the orientation of the net's mouth, through which the phytoplankton are collected. Over a decade later, the process was updated with the construction of the tow frame, Bagel, which Phyto-Finders described in a paper presented at OCEANS '18 in Charleston, SC. Since then Bagel has been used for every sample collection, but phytoplankton sampling remains a difficult task.

II. Collecting Samples and Reviewing Bagel

First, one person must throw a bucket into the water to collect a preliminary water sample. This is done in case there is a toxic bloom in progress; significant discoloration of the water would warn us that special precautions or backing off entirely is necessary. It then takes two people to complete one sample, by steadily towing the frame, to which a rope bridle is attached, over a fixed distance alongside the pier. Although this technique does control the mouth of the net, a major improvement, it is inconsistent in poor weather conditions, such as high winds and strong waves. And, even in good conditions, it is difficult to get the net and the sample bottle located at the end of the net to submerge, because of trapped air.

Club members have found through experience that winds mixed with choppy water make it nearly impossible to collect a consistent, usable sample. The net mouth was connected in

Figure 1. Two club members pull Bagel up after a successful tow (top panel). Students then cap the bottle (bottom panel) and apply a label with the date and location before beginning a new tow further along the pier.

Figure 2. Bagel has a breached net and bottle, which calls for a restart of the tow. Students must repeatedly dunk the frame until it is submerged properly, a frustrating exercise that potentially compromises the sample even during relatively good conditions.

the center on the original frame and the net body and sample bottle could move freely, having no surrounding support. Scenarios such as an inside-out net or a breached bottle, which can force termination of the sample tow, are far too frequent. Air gets trapped and breaches the bottle when Bagel's net isn't completely vertical as it makes contact with the water, especially if the speed of immersion cannot be controlled due to wind and waves. An inside-out net is caused when currents, winds, and waves conspire to push the bottle forward through the mouth of the net before the tow can start. If either failure occurs, the tow must be scratched and restarted.

To address these issues, the club brainstormed ideas for potential improvements during a December 2019 visit by IEEE Oceanic Engineering Society (OES) mentors, Drs. Todd and Hilary Morrison.

III. December 2019 Visit

During the Morrisons' two-day visit to the Outer Banks of North Carolina, Todd and club members worked together to assess towing techniques, particularly with new members, and discussed ideas for improving the performance and behavior of Bagel. And all Phyto-Finders had the opportunity to learn DNA extraction protocols from Hilary in the FFHS lab of our AP science teacher and club advisor, Katie Neller.

While collecting samples from the piers, experienced students taught collection techniques to new members. All of us shared ideas for overcoming the observed problems of breaching and inversion. We discussed and refined these ideas with Todd, who encouraged us to start trials of our best ideas.

We decided that supporting the net and bottle with a rigid frame was a particularly promising approach, but were uncertain how to fabricate one. We also anticipated that transporting and handling the combination of tow and net frames would be awkward and that releasing the sample bottle without compromising the sample would be difficult. We believe we can solve the fabrication problem by using a tomato cage, available from gardening stores. Credit to an unnamed Phyto-Finder for a creative and easily implemented solution!

For the other problems, we are still talking and planning and intend to have these advancements developed and in use by next school year. Once we have that enhancement working reliably, our next planned development is a Bagel that can be configured to sample at different depths, not just at the surface.

Every week during the school year (when there isn't a pandemic) we examine our phytoplankton samples under microscopes, typically the day after collecting them. We look for a number of different species using a reference sheet that identifies which species produce toxins. And then we document our observations and send the results to NOAA.

Taking an even deeper look into our local waters, Dr. Hilary Morrison taught club members how to extract DNA from phytoplankton and other organisms in our samples. The process requires precision and care, but we worked diligently with Hilary and with each other to get it right.

The finished product, about 30 µl of liquid containing the DNA from many different organisms, is sent to Hilary's lab at the Marine Biological Laboratory in Woods Hole, MA. There it can be processed to identify, with very high sensitivity, the microbial, planktonic, and macroscopic species present in the waters of the Outer Banks of North Carolina. Soon, we hope, some of us will be able to travel to Woods Hole to participate directly in that processing.

Figure 3. Phyto-Finders carefully measure and combine reagents as they learn and then teach the detailed steps of the DNA extraction protocol.

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