



OCEANS'10
IEEE Sydney
24-27 May 2010



SESSIONS

AUTHORS

PROGRAM

SEARCH

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Sessions by Day/Time

E-M and opto-acoustic sensing Tuesday, 1:00 PM - 2:45 PM

Co-Chairs:

Roy Hughes, *DSTO*

Underwater communications 1 Tuesday, 1:00 PM - 2:45 PM

Co-Chairs:

Michael Frater, *AFDA*

Advances in integrated marine observing systems 1 Tuesday, 1:00 PM - 2:45 PM

Co-Chairs:

Simon Allen, *University of Tasmania*

Autonomous underwater vehicles 1 Tuesday, 1:00 PM - 2:45 PM

Co-Chairs:

David Lane, *Heriot-Watt University, UK*

Torsten Pfuetzenreuter, *Fraunhofer Application Center System Technology, Germany*

Array signal processing and array design 1 Tuesday, 1:00 PM - 2:45 PM

Co-Chairs:

Michael Clark, *Thales Australia*

Sound propagation and scattering Tuesday, 1:00 PM - 2:45 PM

Co-Chairs:

Chris Gillard, *DSTO*

Student poster oral presentation 1 Tuesday, 1:00 PM - 2:45 PM

Co-Chairs:

Stefan Williams, *University of Sydney*

Norm Miller, *IEEE/OES*

Sessions by Day/Time

High frequency radars Tuesday, 3:15 PM - 5:00 PM

Co-Chairs:

Stuart Anderson, *Defence Science & Technology Organisation, Australia*

Underwater communications 2 Tuesday, 3:15 PM - 5:00 PM

Co-Chairs:

Craig Benson, *University of New South Wales, Australia*

Advances in exploration and recovery for the offshore oil & gas industry Tuesday, 3:15 PM - 5:00 PM

Co-Chairs:

Jeanne Young, *CSIRO Materials Science & Engineering, Australia*

Vehicle navigation 1 Tuesday, 3:15 PM - 5:00 PM

Co-Chairs:

Wen Xu, *Zhejiang Univerisity, China*

Eric Wolbrecht, *University of Idaho*

Autonomous underwater vehicles 2 Tuesday, 3:15 PM - 5:00 PM

Co-Chairs:

Justin Manley, *Liquid Robotics, USA*

Imaging and vision Tuesday, 3:15 PM - 5:00 PM

Co-Chairs:

Christopher Roman, *University of Rhode Island, USA*

Roman Ilin, *Air Force Research Laboratory, USA*

Student poster oral presentation 2 Tuesday, 3:15 PM - 5:00 PM

Co-Chairs:

Stefan Williams, *University of Sydney*

Norm Miller, *IEEE/OES*

Sessions by Day/Time

Current measurement technology Wednesday, 8:30 AM - 10:15 AM

Co-Chairs:

Albert Williams, *Woods Hole Oceanographic Institution, USA*

Malcolm Heron, *Australian Coastal Ocean Radar Network*

Sonar signal processing 1 Wednesday, 8:30 AM - 10:15 AM

Co-Chairs:

Peter Gough, *Acoustics Research Group, University of Canterbury, New Zealand*

Advances in marine management Wednesday, 8:30 AM - 10:15 AM

Co-Chairs:

Douglas Cato, *Defence Science & Technology Organisation / University of Sydney, Australia*

Diane DiMassa, *Massachusetts Maritime Academy, USA*

Autonomous underwater vehicles 3 Wednesday, 8:30 AM - 10:15 AM

Co-Chairs:

Oscar Pizarro, *Australian Centre for Field Robotics*

Daniel Sgarioto, *Defence Technology Agency, New Zealand*

Numerical modeling and simulation Wednesday, 8:30 AM - 10:15 AM

Co-Chairs:

Frederick Maltz, *Consultant*

Systems and observatories 1 Wednesday, 8:30 AM - 10:15 AM

Co-Chairs:

Andrew Clark, *CSnet International, Inc., USA*

Neal Pettigrew, *University of Maine, USA*

Student poster oral presentation 3 Wednesday, 8:30 AM - 10:15 AM

Co-Chairs:

Stefan Williams, *University of Sydney*

Norm Miller, *IEEE/OES*

Sessions by Day/Time

Oceanography 1

Wednesday, 10:45 AM - 12:30 PM

Co-Chairs:

Paulo de Souza, *Tasmanian Information & Communication Technologies Centre, Australia*

Nobuyoshi Kouguchi, *Kobe University, Graduate School of Maritime Sciences, Japan*

Underwater communications 3

Wednesday, 10:45 AM - 12:30 PM

Co-Chairs:

Milica Stojanovic, *Northeastern University, USA*

Advances in underwater imaging and mapping

Wednesday, 10:45 AM - 12:30 PM

Co-Chairs:

Marc Pinto, *NURC*

Vehicle navigation 2

Wednesday, 10:45 AM - 12:30 PM

Co-Chairs:

Jenhwa Guo, *Department of Engineering Science and Ocean Engineering, National Taiwan University*

Hsin-Hung Chen, *National Sun Yat-sen University, Taiwan*

Remotely operated vehicles

Wednesday, 10:45 AM - 12:30 PM

Co-Chairs:

Shinichi Takagawa, *Institute of Industrial Science, University of Tokyo, Japan*

Tomoya Inoue, *Japan Agency for Marine-Earth Science and Technology*

Classification and pattern recognition

Wednesday, 10:45 AM - 12:30 PM

Co-Chairs:

Phil Chapple, *DSTO*

Sessions by Day/Time

Hydrography / seafloor mapping / geodesy

Wednesday, 1:30 PM - 3:15 PM

Co-Chairs: Magnus Wettle, *Geoscience Australia*

Jianhu Zhao, *School of Geodesy and Geomatics, Wuhan University, China*

Sonar signal processing 2

Wednesday, 1:30 PM - 3:15 PM

Co-Chairs:

Peter Gough, *Acoustics Research Group, University of Canterbury, New Zealand*

Advances in integrated marine observing systems 2

Wednesday, 1:30 PM - 3:15 PM

Co-Chairs: Simon Allen, *University of Tasmania*

Vehicle design 1

Wednesday, 1:30 PM - 3:15 PM

Co-Chairs:

Hayato Kondo, *Tokyo University of Marine Science and Technology, Japan*

Yun Hae Kim, *Korea Maritime University*

Signal coherence and fluctuation

Wednesday, 1:30 PM - 3:15 PM

Co-Chairs: Adrian Jones, *Defence Science & Technology Organisation, Australia*

Marine optics technology and instrumentation

Wednesday, 1:30 PM - 3:15 PM

Co-Chairs: John Watson, *University of Aberdeen*

David Farrant, *CSIRO Materials Science & Engineering, Australia*

Ocean energy and offshore structures

Wednesday, 1:30 PM - 3:15 PM

Co-Chairs: David Griffin, *CSIRO Wealth from Oceans Flagship, Australia*

Evan Zimmerman, *Delmar, USA*

Sessions by Day/Time

Oceanography 2

Wednesday, 3:45 PM - 5:30 PM

Co-Chairs: **Damian Ogburn**, *URS Australia*

Sirod Sirisup, *National Electronics and Computer Technology Center, Thailand*

Underwater communications 4

Wednesday, 3:45 PM - 5:30 PM

Co-Chairs: **Craig Benson**, *University of New South Wales, Australia*

Shengli Zhou, *University of Connecticut*

Bioacoustics

Wednesday, 3:45 PM - 5:30 PM

Co-Chairs:

Douglas Cato, *Defence Science & Technology Organisation / University of Sydney, Australia*

Collaborative autonomous vehicles 1

Wednesday, 3:45 PM - 5:30 PM

Co-Chairs: **David Lane**, *SeeByte Ltd, UK*

Michael Jakuba, *Australian Centre for Field Robotics, University of Sydney, Australia*

Automatic control

Wednesday, 3:45 PM - 5:30 PM

Co-Chairs:

Chau-Chang Wang, *Institute of Applied Marine Physics and Undersea Technology, National Sun Yat-sen University, Taiwan*

Nuno Cruz, *Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal*

Sonar imaging

Wednesday, 3:45 PM - 5:30 PM

Co-Chairs: **Roy Hansen**, *Norwegian Defence Research Establishment*

Didier Gueriot, *Télécom Bretagne, France*

Marine safety

Wednesday, 3:45 PM - 5:30 PM

Co-Chairs:

Etsuro Shimizu, *Tokyo University of Marine Science and Technology, Japan*

Eiichi Kobayashi, *Kobe University, Japan*

Sessions by Day/Time

Naval architecture

Thursday, 8:30 AM - 10:15 AM

Co-Chairs: Daniel Rolland, *Alion Science and Technology, USA*
Shigeaki Shiotani, *Kobe University, Japan*

Sonar signal processing 3

Thursday, 8:30 AM - 10:15 AM

Co-Chairs: Douglas Abraham, *CausaSci LLC, USA*
Christian de Moustier, *HLS Research, Inc., USA*

Advances in understanding of marine environments in the Western Pacific 1

Thursday, 8:30 AM - 10:15 AM

Co-Chairs: Yusaku Kyojuka, *Kyushu University, Japan*
Dong-Jiing Doong, *Department of Marine Environmental Informatics, National Taiwan Ocean University*

Autonomous underwater vehicles 4

Thursday, 8:30 AM - 10:15 AM

Co-Chairs: Mike Eichhorn, *National Research Council Canada*
Jose Mare, *ATSA Defence Services, Australia*

Data assimilation and information management

Thursday, 8:30 AM - 10:15 AM

Co-Chairs: David Griffin, *CSIRO Wealth from Oceans Flagship, Australia*
Nugzar Margvelashvili, *CSIRO Marine & Atmospheric Research, Australia*

Systems and observatories 2

Thursday, 8:30 AM - 10:15 AM

Co-Chairs: Arjuna Balasuriya, *Massachusetts Institute of Technology, USA*
Paulo de Souza, *Tasmanian Information & Communication Technologies Centre, Australia*

Marine radars and communications

Thursday, 8:30 AM - 10:15 AM

Co-Chairs:
Stuart Anderson, *Defence Science & Technology Organisation, Australia*
Nobukazu Wakabayashi, *Kobe University, Japan*

Sessions by Day/Time

Model based signal processing techniques

Thursday, 10:45 AM - 12:30 PM

Co-Chairs:

James Candy, *Lawrence Livermore National Laboratory, USA*

Christophe Sintes, *Telecom-Bretagne*

Underwater communications 5

Thursday, 10:45 AM - 12:30 PM

Co-Chairs: **Lee Freitag**, *Woods Hole Oceanographic Institution, USA*

Advances in understanding of marine environments in the Western Pacific 2

Thursday, 10:45 AM - 12:30 PM

Co-Chairs:

Toru Sato, *University of Tokyo, Japan*

Beom-Soo Hyun, *Korea Maritime University*

Vehicle navigation 3

Thursday, 10:45 AM - 12:30 PM

Co-Chairs: **William Kirkwood**, *mbari*

Autonomous surface vehicles

Thursday, 10:45 AM - 12:30 PM

Co-Chairs:

Nuno Cruz, *Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal*

Chau-Chang Wang, *Institute of Applied Marine Physics and Undersea Technology, National Sun Yat-sen University, Taiwan*

Anti-submarine warfare

Thursday, 10:45 AM - 12:30 PM

Co-Chairs: **David Liebing**, *DSTO*

Marine geology and geophysics

Thursday, 10:45 AM - 12:30 PM

Co-Chairs:

Nicholas Chotiros, *Applied Research Laboratories, University of Texas, USA*

Blair Thornton, *University of Tokyo, Japan*

Sessions by Day/Time

SAR / ocean color and hyperspectral measurements

Thursday, 1:30 PM - 3:15 PM

Co-Chairs:

Roy Hughes, *DSTO*

Underwater communications 6

Thursday, 1:30 PM - 3:15 PM

Co-Chairs:

Mandar Chitre, *Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Yahong Zheng, *Missouri University of Science and Technology, USA*

Advances in integrated marine observing systems 3

Thursday, 1:30 PM - 3:15 PM

Co-Chairs:

Simon Allen, *University of Tasmania*

Vehicle design 2

Thursday, 1:30 PM - 3:15 PM

Co-Chairs:

Hayato Kondo, *Tokyo University of Marine Science and Technology, Japan*

Ji-Hong Li, *Pohang Institute of Intelligent Robotics, Korea*

Array signal processing and array design 2

Thursday, 1:30 PM - 3:15 PM

Co-Chairs:

Michael Clark, *Thales Australia*

Maritime security and harbour protection

Thursday, 1:30 PM - 3:15 PM

Co-Chairs:

Alan Theobald, *DSTO*

Sustainable energy in East Asia

Thursday, 1:30 PM - 3:15 PM

Co-Chairs:

Beom-Soo Hyun, *Korea Maritime University*

Toru Sato, *University of Tokyo, Japan*

Sessions by Day/Time

Underwater communications 7 **Thursday, 3:45 PM - 5:30 PM**

Co-Chairs:

Saman Abeysekera, *Nanyang Technological University, Singapore*

Pierre-Jean Bouvet, *Underwater Acoustics Lab, Institut Superieur de l'Electronique et du Numerique Brest, France*

Buoy technology **Thursday, 3:45 PM - 5:30 PM**

Co-Chairs:

Lindsay Pender, *CSIRO Marine & Atmospheric Research, Australia*

David Hughes, *CSIRO Marine & Atmospheric Research, Australia*

Collaborative autonomous vehicles 2 **Thursday, 3:45 PM - 5:30 PM**

Co-Chairs:

Vladimir Djapic, *NATO Undersea Research Centre*

Ryan Smith, *University of Southern California, USA*

Data visualization and information management **Thursday, 3:45 PM - 5:30 PM**

Co-Chairs:

Kate Beard, *University of Maine, USA*

Scott Bainbridge, *Australian Institute of Marine Science*

Sonar and transducers / oceanographic sensors **Thursday, 3:45 PM - 5:30 PM**

Co-Chairs:

Kenichi Asakawa, *Japan Agency for Marine-Earth Science and Technology*

Paul Macoun, *VENUS Facility, University of Victoria, Canada*

Marine environmental engineering in East Asia **Thursday, 3:45 PM - 5:30 PM**

Co-Chairs:

Dong-Jiing Doong, *Department of Marine Environmental Informatics, National Taiwan Ocean University*

Yusaku Kyozen, *Kyushu University, Japan*

Sessions/Papers by Day/Time

E-M and opto-acoustic sensing

Tuesday, 1:00 PM - 2:45 PM

CO-Chairs:

Roy Hughes, *DSTO*

Opto-Acoustic Underwater Remote Sensing (OAURS) - An Optical Sonar?

David Farrant¹; Jan Burke¹; Laurence Dickinson¹; Philip Fairman¹; John Wendoloski²

¹*CSIRO Materials Science & Engineering, Australia*

²*Defence Science & Technology Organisation, Australia*

Development Of A High Temperature Superconducting Magnetic Tensor Gradiometer For Underwater UXO Detection

Jeanne Young¹; David Clark¹; Shane Keenan¹; Peter Sullivan¹; Stephen Billings²

¹*CSIRO Materials Science & Engineering, Australia*

²*Sky Research Inc, USA*

Requirements For Unexploded Ordnance Detection And Discrimination In The Marine Environment Using Magnetic And Electromagnetic Sensors

Stephen Billings; Fridon Shubitidze; Leonard Pasion; Laurens Beran; Jack Foley

Sky Research Inc, USA

Sessions/Papers by Day/Time

Underwater communications 1

Tuesday, 1:00 PM - 2:45 PM

CO-Chairs:

Michael Frater, *AFDA*

Experimental Results On Adaptive MMSE Turbo Equalization In Shallow Underwater Acoustic Communication

Christophe Laot¹; Pascal Coincé²

¹*Télécom Bretagne, France*

²*Sercel, France*

Check And Validate Reed Solomon Block Turbo Codes In Shallow Underwater Acoustic Communication

Joël TRUBUIL¹; André GOALIC¹; Christophe LAOT¹; Nicolas BEUZELIN²

¹*Télécom Bretagne, France*

²*Groupe & Etudes Sous-Marines de l'Atlantique, France*

On Joint Acoustic Communication And Positioning Through MFSK-Modulated Signals And Costas Arrays

Sébastien PENNEC¹; Gildas Touin¹; Stéphane Azou²; Ludovic Collin²

¹*IXSEA, France*

²*Laboratoire des sciences et techniques de l'information de la communication et de la connaissance, France*

Coherent And Differential Acoustic Communication In Shallow Water Using Transmitter And Receiver Arrays

Dmitry Chizhik¹; Allan Rosenberg²; Qinqing Zhang²

¹*Bell Laboratories, USA*

²*Johns Hopkins University, Applied Physics Laboratory, USA*

Underwater Acoustic QPSK Receiver Implementation And Its Test Results At The Very Shallow Water

Seung-Geun Kim; Sea-Moon Kim; Sung-Hoon Byun; Jong-Won Park; Changho Yun; Young-Kon Lim

Maritime & Ocean Engineering Research Institute / Korea Ocean Research & Development Institute

Sessions/Papers by Day/Time

Advances in integrated marine observing systems 1

Tuesday, 1:00 PM - 2:45 PM

C0-Chairs:

Simon Allen, *University of Tasmania*

Connecting The Dots: Ocean Observing Systems And Public Policy

Martin Taylor¹; Brian Bornhold²

¹*Ocean Networks Canada*

²*Coastal and Ocean Resources Inc, Canada*

The VENUS Facility - A Bottom-Up Approach To Building An Ocean Observing System

Paul Macoun; Adrian Round; Richard Dewey

VENUS Facility, University of Victoria, Canada

Integrating Observation Systems: An Example From The Great Barrier Reef

Scott Bainbridge¹; Craig Steinberg¹; Mal Heron²; Miles Furnas¹

¹*Australian Institute of Marine Science*

²*James Cook University, Australia*

BLUElink: An Integrator Of The Integrated Marine Observing System

David Griffin; Peter Oke

CSIRO Wealth from Oceans Flagship, Australia

Advances In The Gulf Of Maine Ocean Observing System: Technical Capabilities And Scientific Results

Neal Pettigrew; Charles Fikes; M. Beard

University of Maine, USA

Sessions/Papers by Day/Time

Autonomous underwater vehicles 1

Tuesday, 1:00 PM - 2:45 PM

C0-Chairs:

David Lane, *Heriot-Watt University, UK*

Torsten Pfuetzenreuter, *Fraunhofer Application Center System Technology, Germany*

ConSys - A New Software Framework For Underwater Vehicles

Torsten Pfuetzenreuter; Helge Renkewitz

Fraunhofer Application Center System Technology, Germany

MarineSIM : Robot Simulation For Marine Environment

P.G. Chaminda Senarathne¹; Wijerupage Wijesoma¹; Kwang Lee²; Bharath Kalyan¹; Diluka Moratuwage¹; Nicholas Patrikalakis³; Franz Hover³

¹*Nanyang Technological University, Singapore*

²*DSO National Laboratories, Singapore*

³*Massachusetts Institute of Technology, USA*

A Versatile Underwater Tracking System For AUV Testing

Jesse Pentzer¹; Douglas Odell²; John Canning³; Dean Edwards³

¹*University of Idaho, USA*

²*Naval Surface Warfare Center, Carderock Division, Acoustic Research Detachment, USA*

³*Center for Intelligent Systems Research, University of Idaho, USA*

A Tool Chain For AUV System Testing

Marco Jacobi; Thomas Rauschenbach

Fraunhofer IOSB-AST, Germany

The Memorial Explorer: Developing The Role Of AUVs In Under-Ice Research

Peter King¹; Ron Lewis¹; Dan Walker¹; Polly Alexander²; Neil Bose²; Anthony Worby³

¹*Memorial University of Newfoundland, Canada*

²*University of Tasmania, Australia*

³*Australian Antarctic Division*

Sessions/Papers by Day/Time

Array signal processing and array design 1

Tuesday, 1:00 PM - 2:45 PM

C0-Chairs:

Michael Clark, *Thales Australia*

Optimal Spatial Filtering Of Real Data From Submarine Sonar Arrays

Brian Ferguson; Dragana Carevic

Defence Science & Technology Organisation, Australia

Multipath Reduction For Bathymetry Using Adaptive Beamforming

Ann Blomberg¹; Michael Hayes²

¹*University of Oslo, Norway*

²*University of Canterbury, New Zealand*

Iterative Adaptive Approach For Wide-Band Active Sonar Array Processing

Zhaofu Chen¹; Jian Li¹; Petre Stoica²; Kam Lo³

¹*University of Florida, USA*

²*Uppsala University, Sweden*

³*Defence Science & Technology Organisation, Australia*

Comparison Of The Performance Of Time Domain And Time-Frequency Domain Adaptive Beamforming

Chaoying Bao¹; George Farag²; Jie Pan²

¹*Defence Science & Technology Organisation, Australia*

²*University of Western Australia*

Near-Field Beamforming For A Multi-Beam Echo Sounder - Approximation And Error Analysis

Ying Jiang; Wen Xu; Lingsheng Chen; Xiang Pan

Zhejiang Univerisity, China

Sessions/Papers by Day/Time

Sound propagation and scattering

Tuesday, 1:00 PM - 2:45 PM

C0-Chairs:

Chris Gillard, *DSTO*

Modelling Acoustic Reflection Loss At The Ocean Surface For Small Angles Of Incidence

Adrian Jones¹; Alec Duncan²; Amos Maggi²; Janice Sendt³; Paul Clarke¹

¹*Defence Science & Technology Organisation, Australia*

²*Centre for Marine Science & Technology, Curtin University of Technology, Australia*

³*Thales, Australia*

On Some Rigorous Computational Ocean-Acoustic Modelling Tools

David Bartel

Defence Science & Technology Organisation, Australia

Calcarenite As A Poroelastic Granular Medium

Nicholas Chotiros; Marcia Isakson

Applied Research Laboratories, University of Texas, USA

Sonar Uncertainty And Sensitivity Analysis Techniques

Douglas Sweet; Chris Gillard

Defence Science & Technology Organisation, Australia

Sessions/Papers by Day/Time

Student poster oral presentation 1

Tuesday, 1:00 PM - 2:45 PM

CO-Chairs:

Stefan Williams, *University of Sydney*

Norm Miller, *IEEE/OES*

A Maximum Entropy Framework For Statistical Modeling Of Underwater Acoustic Communication Channels

François-Xavier Socheleau¹; Christophe Laot¹; Jean-Michel Passerieux²

¹*Télécom Bretagne, France*

²*Thales Underwater Systems, France*

Target Tracking In State Dependent Wake Clutter

Edmund Brekke¹; Oddvar Hallingstad¹; John Glattetre²

¹*Unik, Norway*

²*Kongsberg Maritime, Norway*

Underwater Glider Propulsion Using Chemical Hydrides

Jo Borchsenius; Shane Pinder

Auckland University of Technology, New Zealand

Time Reversal Mirror: Temporal And Spatial Focusing Tool

Divya Parihar; Ankit Agarwal; Monika Agrawal

Indian Institute of Technology Delhi

Video-Image Processing Applied To The Analysis Of The Behaviour Of Deep-Water Lobsters (*Nephrops norvegicus*)

Sergi Pons Freixes¹; Jaume Piera¹; Jacopo Aguzzi²

¹*Marine Technology Unit, Centre Mediterrani d'Investigacions Marines i Ambientals, Spain*

²*Institute of Marine Sciences, Centre Mediterrani d'Investigacions Marines i Ambientals, Spain*

Constrained Stereo Correspondence For 3D Sea-Floor Reconstruction

Gabrielle Inglis; Chris Roman

University of Rhode Island, USA

Water Column Current Profile Aided Localisation For Autonomous Underwater Vehicles

Lashika Medagoda; Stefan Williams; Michael Jakuba; Oscar Pizarro

Australian Centre for Field Robotics, University of Sydney, Australia

Sessions/Papers by Day/Time

High frequency radars

Tuesday, 3:15 PM - 5:00 PM

CO-Chairs:

Stuart Anderson, *Defence Science & Technology Organisation, Australia*

Further Analysis Of The Modulation Of High Frequency Radar Spectra Due To Sea-Induced Antenna Platform Motion

John Walsh¹; Bernard Ryan¹; Eric Gill¹; Jacques El Khoury²

¹*Memorial University of Newfoundland, Canada*

²*Ecole Supérieure d'Electricité (Supelec), France*

Wind Direction Manifestation On HF Ocean Radar Echoes

Malcolm Heron¹; Peter Marrone²

¹*Australian Coastal Ocean Radar Network*

²*Darwin Technologies, Australia*

The Use Of HF Radar Surface Currents For Computing Lagrangian Trajectories: Benefits And Issues

Alessandra Mantovanelli; Malcolm Heron; Arnstein Prytz

James Cook University, Australia

Rapid Deployable HF Radar For Norwegian Emergency Spill Operations

Chad Whelan¹; Anton Kjelaas²; Donald Barrick¹; Peter Lilleboe¹; Vicente Fernandez³;

Andrés Martirena³; Øyvind Breivik⁴; Bruce Hackett⁴

¹*CODAR Ocean Sensors, Ltd., USA*

²*CodarNor AS, Norway*

³*Qualitas Remos, Spain*

⁴*Norwegian Meteorological Institute*

Can Vertical Mixing From Turbulent Kinetic Energy Mitigate Coral Bleaching? An Application Of HF Ocean Radar

Diane DiMassa¹; Malcolm Heron²; Alessandra Mantovanelli²; Scott Heron³; Craig Steinberg⁴

¹*Massachusetts Maritime Academy, USA*

²*James Cook University, Australia*

³*National Oceanographic & Atmospheric Administration, USA*

⁴*Australian Institute of Marine Science*

Sessions/Papers by Day/Time

Underwater communications 2

Tuesday, 3:15 PM - 5:00 PM

C0-Chairs:

Craig Benson, *University of New South Wales, Australia*

Acoustic Modems, Navigation Aids, And Networks For Undersea Operations

Dale Green

Teledyne Benthos, USA

Design Of A Low-Cost Short-Range Underwater Acoustic Modem

Bridget Benson¹; Ying Li¹; Brian Faunce¹; Kenneth Domond²; Donald Kimball²; Curt Schurgers¹; Ryan Kastner¹

¹*University of California San Diego, USA*

²*California Institute for Telecommunications and Information Technology, USA*

Design Of A High Frequency FPGA Acoustic Modem For Underwater Communication

Nusrat Nowsheen; Craig Benson; Michael Frater

University of New South Wales, Australia

DSP Implementation Of Siso And MIMO OFDM Acoustic Modems

Hai Yan; Shengli Zhou; Zhijie Shi; Jun-Hong Cui; Lei Wan; Jie Huang; Hao Zhou

University of Connecticut, USA

The Design And Experiment Of A Software-Defined Acoustic Modem For Underwater Sensor Network

Yu Li; Haining Huang

Institute of Acoustics, Chinese Academy of Sciences

Sessions/Papers by Day/Time

Advances in exploration and recovery for the offshore oil & gas industry

Tuesday, 3:15 PM - 5:00 PM

CO-Chairs:

Jeanne Young, *CSIRO Materials Science & Engineering, Australia*

Offshore Petroleum Exploration From Space

Magnus Wettle¹; Paul Daniel²; Graham Logan¹; Medhavy Thankappan¹

¹*Geoscience Australia*

²*CSIRO Land & Water, Australia*

Correction Of Electric And Magnetic Fields And Gradients Measured Within And Around An Insulating Sensor Capsule In Seawater

David Clark

CSIRO Materials Science & Engineering, Australia

Development Of An Arrayed Hydrocarbon Sensing System For The Detection Of Seeped Hydrocarbons

Xiubin Qi; Emma Crooke; Andrew Ross

CSIRO Earth Science & Resource Engineering, Australia

Proven High Efficiency Anchor For Harsh Cyclonic Environments

Evan Zimmerman

Delmar, USA

The Assessment And Evolution Of Offshore Gas Hydrate Deposits Using Seafloor Controlled Source Electromagnetic Methodology

Nigel Edwards¹; Reza Mir¹; Ele Willoughby¹; Katrin Schwalenberg²; Carsten Scholl³

¹*University of Toronto, Canada*

²*Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), Germany*

³*Fugro Electro Magnetic GmbH, Germany*

Sessions/Papers by Day/Time

Vehicle navigation 1

Tuesday, 3:15 PM - 5:00 PM

CO-Chairs:

Wen Xu, *Zhejiang Univerisity, China*

Eric Wolbrecht, *University of Idaho*

AUV Navigation With An Extended Kalman Filter In A Magnetic Disturbance

Benjamin Armstrong¹; Eric Wolbrecht¹; Dean Edwards²

¹*University of Idaho, USA*

²*Center for Intelligent Systems Research, University of Idaho, USA*

USBL Pose Estimation Using Multiple Responders

Leif Christensen; Martin Fritsche; Jan Albiez; Frank Kirchner

DFKI Bremen - Robotics Innovation Center, Germany

AUV Positioning Based On Interactive Multiple Model

Hongqing Liu; Mandar Chitre; Rui Gao

Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore

Cooperative Positioning Using Range-Only Measurements Between Two AUVs

Rui Gao; Mandar Chire

Tropical Marine Science Institute, National University of Singapore

Log Sensor Calibration Using M-Estimate

Daxiong Ji; Jian LIU; Kaizhou LIU

Shenyang Institute of Automation, Chinese Academy of Sciences

Sessions/Papers by Day/Time

Autonomous underwater vehicles 2

Tuesday, 3:15 PM - 5:00 PM

CO-Chairs:

Justin Manley, *Liquid Robotics, USA*

Sensing The Underwater Acoustic Environment With A Single Hydrophone Onboard An Undersea Glider

Brian Ferguson; Kam Lo; Joshua Rodgers
Defence Science & Technology Organisation, Australia

Estimation Of Wave Parameters From Accelerometry Data To Aid AUV-Shore Communication

Arvind de Menezes Pereira; Gaurav Sukhatme
University of Southern California, USA

Slocum Glider Energy Measurement And Simulation Infrastructure

Hans Woithe; Ulrich Kremer; Ivan Seskar; Oscar Schofield; Scott Glenn; Murium Iqbal; David Aragon; Ilya Chigirev; Yuriy Shames
Rutgers University, USA

Hydrodynamic Implications For Submarine Launched Underwater Gliders

Joshua Rodgers; John Wharington
Defence Science & Technology Organisation, Australia

Motion Characteristic Analysis Of A Hybrid-Driven Underwater Glider

Shuxin Wang; Xiujun Sun
Tianjin University, China

Sessions/Papers by Day/Time

Imaging and vision

Tuesday, 3:15 PM - 5:00 PM

C0-Chairs:

Christopher Roman, *University of Rhode Island, USA*

Roman Ilin, *Air Force Research Laboratory, USA*

Simultaneous Detection And Tracking Of Multiple Objects In Noisy And Cluttered Environment Using Maximum Likelihood Estimation Framework

Roman Ilin¹; Ross Deming²

¹*Air Force Research Laboratory, USA*

²*Solid State Scientific Corporation, USA*

Underwater Object Reconstruction Method For 3D Target Recognition In An Autonomous Underwater Vehicle.

Pavan Kumar Ambekar¹; Mutanna Kadal²; Karthik Sheshadri¹

¹*Rashtriya Vidhyalaya College of Engineering, India*

²*Indian Institute of Science*

Application Of Structured Light Imaging For High Resolution Mapping Of Underwater Archaeological Sites

Christopher Roman; Gabrielle Inglis; James Rutter

University of Rhode Island, USA

An Approach Of Image Decomposition For Underwater Target Detection By Inhomogeneous Illumination Based On G-Space And PDE

Haiyong Zheng; Bing Zheng; Guangrong Ji

Ocean University of China

Sessions/Papers by Day/Time

Student poster oral presentation 2

Tuesday, 3:15 PM - 5:00 PM

CO-Chairs:

Stefan Williams, *University of Sydney*

Norm Miller, *IEEE/OES*

Modeling Underwater Acoustic Communications For Multi-Robot Missions In A Robotics Simulator

Anuj Sehgal; Daniel Cernea; Andreas Birk

Jacobs University, Germany

The Signal-To-Noise Ratio Of Human Divers

Edmund Brekke¹; Oddvar Hallingstad¹; John Glattetre²

¹*Unik, Norway*

²*Kongsberg Maritime, Norway*

Station Keeping Of Small Outboard-Powered Boats

Aaron Fisher¹; James VanZwieten¹; Tannen VanZwieten²

¹*Florida Atlantic University, USA*

²*NASA Marshall Space Flight Center, USA*

Probabilistic Sonar Scan Matching SLAM For Underwater Environment

Angelos Mallios; Pere Ridao; David Ribas; Emilli Hernandez

Universitat de Girona, Spain

Particle Diversity Reduction For AUV'S Active Localisation

Francesco Maurelli; Yvan Petillot

Heriot-Watt University, UK

Rugosity, Slope And Aspect Derived From Bathymetric Stereo Image 3D Reconstructions

Ariell Friedman; Oscar Pizarro; Stefan Williams

Australian Centre for Field Robotics, University of Sydney, Australia

Dirichlet Process Mixture Models For Autonomous Habitat Classification

Daniel Steinberg; Oscar Pizarro; Stefan Williams; Michael Jakuba

Australian Centre for Field Robotics, University of Sydney, Australia

Sessions/Papers by Day/Time

Current measurement technology

Wednesday, 8:30 AM - 10:15 AM

C0-Chairs:

Albert Williams, *Woods Hole Oceanographic Institution, USA*

Malcolm Heron, *Australian Coastal Ocean Radar Network*

Motion Tracking In An Acoustic Point-Measurement Current Meter

Albert Williams¹; Fredrik Thwaites¹; Archie Morrison²; John Toole¹; Richard Krishfield¹

¹*Woods Hole Oceanographic Institution, USA*

²*Nobska Development, Inc., USA*

High-Frequency Radar Two-Station Baseline Bisector Comparisons Of Radial Components

Daniel Atwater; Mal Heron

James Cook University, Australia

Sea Surface Current Mapping By Radar Doppler Current Profiler

Marius Cysewski; Friedwart Ziemer; Joerg Seemann

Department of Radar Hydrography, GKSS Research Center, Germany

The First Chinese Coastal Acoustic Tomography Experiment

Xiao-Hua ZHU¹; Arata Kaneko²; Qingsong Wu¹; Noriaki Gohda²; Chuanzheng Zhang¹;

Naokazu Taniguchi²

¹*State Key Laboratory of Satellite Ocean Environment Dynamics, Second Institute of Oceanography, State Oceanic Administration, China*

²*Graduate School of Engineering, Hiroshima University, Japan*

Reciprocal Sound Transmission Experiments For Current Measurement In A Tidal River

Chuanzheng Zhang¹; Xiao-Hua ZHU¹; Arata Kaneko²; Qingsong Wu¹; Xiaopeng Fan³; Bo Li³; Guanghong Liao⁴; Tao Zhang³

¹*State Key Laboratory of Satellite Ocean Environment Dynamics, Second Institute of Oceanography, State Oceanic Administration, China*

²*Graduate School of Engineering, Hiroshima University, Japan*

³*Second Institute of Oceanography, State Oceanic Administration, China*

⁴*Second Institute of Oceanography, State Oceanic Administration, China*

Sessions/Papers by Day/Time

Sonar signal processing 1

Wednesday, 8:30 AM - 10:15 AM

C0-Chairs:

Peter Gough, *Acoustics Research Group, University of Canterbury, New Zealand*

Sonar Waveform Design For Optimum Target Detection: The Impact Of Object Burial State

Brandon Hamschin; Patrick Loughlin
University of Pittsburgh, USA

Detection Of Weak Signals In Non-Gaussian Noise Using Nonlinear Wavelet Denoising

Zahra Madadi Ardekani¹; Gargeshwari Anand²; Benjamin Premkumar¹; Chiew Tong Lau¹
¹*Nanyang Technological University, Singapore*
²*Department of Electrical Communication Engineering, Indian Institute of Science*

An Improvement To The Pulse Compression Scheme

Philippe Courmontagne¹; Gregory Julien²; Marie-Edith Bouhier²
¹*Institut Supérieur de l'Electronique et du Numerique Toulon, France*
²*French Research Institute for Exploitation of the Sea*

Acceleration Of Underwater Acoustic Source Localization Algorithms On The CELL Multi-Core Processor Via Vectorization

Neena Imam; Jacob Barhen; Travis Humble
Oak Ridge National Laboratory, USA

Recovering Data And Voice Recorders Following At-Sea Crashes

Dale Green
Teledyne Benthos, USA

Sessions/Papers by Day/Time

Advances in marine management

Wednesday, 8:30 AM - 10:15 AM

C0-Chairs:

Douglas Cato, *Defence Science & Technology Organisation / University of Sydney, Australia*

Diane DiMassa, *Massachusetts Maritime Academy, USA*

Smart Sensors - A New Paradigm For Marine Management: An Example From The Great Barrier Reef

Scott Bainbridge; Damien Eggeling; Geoff Page
Australian Institute of Marine Science

Acoustic Surveying For Beaked Whales In The Coral Sea As A Mitigation Measure For Naval Exercises.

Douglas Cato¹; Mark Savage²; Rebecca Dunlop³; Iain Parnum⁴; Michelle Blewitt⁵; Sue Gibbs⁶; David Donnelly⁷; Jane Cleary²; Robert McCauley⁴

¹*Defence Science & Technology Organisation / University of Sydney, Australia*

²*Defence Science & Technology Organisation, Australia*

³*University of Queensland, Australia*

⁴*Curtin University, Australia*

⁵*University of Sydney, Australia*

⁶*Macquarie University, Australia*

⁷*Dolphin Research Institute, Australia*

Developments In Mapping Of Seabed Habitats For Marine Protected Area Planning And Monitoring

Alan Jordan; Peter Davies; Tim Ingleton; Edwina Mesley; Joe Neilson; Tim Pritchard
New South Wales Department of Environment, Climate Change and Water, Australia

Using An Autonomous Underwater Vehicle To Inform Management Of Biodiversity In Shelf Waters

Neville Barrett¹; Tara Anderson²; Stefan Williams³; Nicole Hill⁴; Jan Seiler⁴; Scott Nicol²

¹*University of Tasmania, Australia*

²*Geoscience Australia*

³*Australian Centre for Field Robotics, University of Sydney, Australia*

⁴*Tasmanian Aquacultures & Fisheries Institute, Australia*

Sessions/Papers by Day/Time

Autonomous underwater vehicles 3

Wednesday, 8:30 AM - 10:15 AM

CO-Chairs:

Oscar Pizarro, *Australian Centre for Field Robotics*

Daniel Sgarioto, *Defence Technology Agency, New Zealand*

High Resolution, Consistent Navigation And 3D Optical Reconstructions From AUVs Using Magnetic Compasses And Pressure-Based Depth Sensors

Michael Jakuba; Oscar Pizarro; Stefan Williams

Australian Centre for Field Robotics, University of Sydney, Australia

Adaptive Behaviour For An Autonomous Underwater Vehicle To Perform Chemical Mappings

Breen Jeremy¹; Paulo de Souza¹; Timms Greg¹; Ollington Robert²

¹*Tasmanian Information & Communication Technologies Centre, Australia*

²*School of Computing and Information Systems, University of Tasmania, Australia*

Reactive AUV Motion For Thermocline Tracking

Nuno Cruz; Aníbal Matos

Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal

A Sub-Region Priority Reaching Control Scheme With A Fuzzy-Logic Algorithm For An Underwater Vehicle Subject To Uncertain Restoring Forces

Zool Ismail; Matthew Dunnigan

School of Engineering and Physical Sciences, Heriot-Watt University, UK

The Influence Of Tidal Currents On The REMUS Autonomous Underwater Vehicle

Daniel Sgarioto

Defence Technology Agency, New Zealand

Sessions/Papers by Day/Time

Numerical modeling and simulation

Wednesday, 8:30 AM - 10:15 AM

CO-Chairs:

Frederick Maltz, *Consultant*

Numerical Simulation Of Deep-Towed Streamer Cable In Ocean Current By ALE Finite Element Method

Junichi Takekawa¹; Hitoshi MIKADA¹; Tada-nori GOTO¹; Eiichi ASAKAWA²; Takuya SHIMURA³

¹*Kyoto University, Japan*

²*JGI Inc., Japan*

³*Japan Agency for Marine-Earth Science and Technology*

Simple Karman Street Model

Cecilia Tapia Siles; Ryad Chellali

Italian Institute of Technology

3D Simulation Of Robotic Fish Interactions With Physic-Based Underwater Environment

Laura Taverna; Ryad Chellali; Lorenzo Rossi

Italian Institute of Technology

Time Domain Numerical Simulation Of Microwave Backscattering From Sea Surface For Radar Remote Sensing

Takero Yoshida¹; Chang-Kyu Rheem²

¹*Department of Ocean Technology Policy & Environment, University of Tokyo, Japan*

²*IIS, The university of Tokyo, Japan*

Validation Of Numerical Model For Bubble Dispersion Over A Hydrofoil

Shuang Zhu¹; Andrew Ooi¹; Hugh Blackburn²; Brendon Anderson³

¹*University of Melbourne, Australia*

²*Monash University, Australia*

³*Defence Science & Technology Organisation, Australia*

Sessions/Papers by Day/Time

Systems and observatories 1

Wednesday, 8:30 AM - 10:15 AM

CO-Chairs:

Andrew Clark, *CSnet International, Inc., USA*

Neal Pettigrew, *University of Maine, USA*

November 2009 Tropical Cyclone Phyan In The Eastern Arabian Sea: Oceanic Response Along West India Coast And Kavaratti Lagoon

Antony Joseph; R Prabhudesai; Prakash Mehra; Vijay Kumar; Yogesh Agarvadekar; Ryan Luis; Pradhan Rivankar; Blossom Viegas

National Institute of Oceanography, India

A Combined Benthic Grab And Observation System For Rapid Assessment Of Water Column And Seabed

Matthew Sherlock; Rudy Kloser; Tim Ryan; Alan Williams

CSIRO Marine & Atmospheric Research, Australia

The Coral Proto Free Ocean Carbon Enrichment System (CP-FOCE): Engineering And Development

Malcolm Marker¹; David Kline¹; Bill Kirkwood²; Kent Headley²; Peter Brewer²; Edward Peltzer²; Thomas Miard¹; Aaron Chai¹; Mark James¹; Kenneth Schneider³; Jack Silverman⁴; Ken Caldeira³; Stephen Monismith⁵; Brad Opdyke⁶; Rob Dunbar⁵; Ray White¹; Sophie Dove⁷; Ove Hoegh-Guldberg⁷

¹*University of Queensland, Australia*

²*Monterey Bay Aquarium Research Institute, USA*

³*Carnegie Institution, Department of Global Ecology, USA*

⁴*Israel Oceanographic & Limnological Research Ltd*

⁵*Stanford University, USA*

⁶*Australian National University*

⁷*Centre for Marine Studies, University of Queensland, Australia*

The Nazare Canyon (W Portugal) Observatory - Real Time Monitoring Of A Large Submarine Canyon.

Ines Martins; Joao Vitorino; Sara Almeida

Instituto Hidrografico, Portugal

Design Of A Prototype Tsunami Warning And Early Response System For Cyprus - TWERC

Georgios Georgiou¹; Andrew Clark²; George Zodiatis¹; Daniel Hayes¹; Dimitris Glekas³

¹*University of Cyprus*

²*CSnet International, Inc., USA*

³*CSnet CYPRUS Ltd., Cyprus*

Sessions/Papers by Day/Time

Student poster oral presentation 3

Wednesday, 8:30 AM - 10:15 AM

CO-Chairs:

Stefan Williams, *University of Sydney*

Norm Miller, *IEEE/OES*

Precise Sound Source Localisation Of Dolphin Biosonar Pulse Transmissions

Eric Ferguson

University of Sydney, Australia

Effects Of Climate Change And Anthropogenic Ocean Acidification On Underwater Acoustic Communications

Anuj Sehgal; Iyad Tumar; Jürgen Schönwälder

Jacobs University, Germany

Mapping Marine Phytoplankton Assemblages From A Hyperspectral And Artificial Intelligence Perspective

Elena Torrecilla¹; Sergi Pons¹; Albert Vilamala²; Ismael F. Aymerich¹; Josep Arcos²; Enric Plaza²; Jaume Piera¹

¹*Marine Technology Unit, Centre Mediterrani d'Investigacions Marines i Ambientals, Spain*

²*Artificial Intelligence Research Institute, Spanish Council for Scientific Research*

Water Profile Navigation With An Acoustic Doppler Current Profiler

Michael Stanway

Massachusetts Institute of Technology / Woods Hole Oceanographic Institution Joint Program, USA

Calibration Of Optical Camera Coupled To Acoustic Multibeam For Underwater 3D Scene Reconstruction

Natàlia Hurtós; Xavier Cufí; Joaquim Salvi

Universitat de Girona, Spain

Control System Performance And Efficiency For A Mid-Depth Lagrangian Profiling Float

Bryan McGilvray; Christopher Roman

University of Rhode Island, USA

The Role Of Carbonic Anhydrase Enzyme In The Biocalcification Process Of Coral And Its Resilience To Global Climate Change

M. Azizur Rahman; Tamotsu Oomori

University of the Ryukyus, Japan

Sessions/Papers by Day/Time

Oceanography 1

Wednesday, 10:45 AM - 12:30 PM

CO-Chairs:

Paulo de Souza, *Tasmanian Information & Communication Technologies Centre, Australia*

Nobuyoshi Kouguchi, *Kobe University, Graduate School of Maritime Sciences, Japan*

Wave Remote Sensing System By GPS

Nobuyoshi Kouguchi¹; Jian CUI¹; Akihiro IKAWA¹; Shigeyuki OKUDA²; Yasuo ARAI²

¹*Kobe University, Graduate School of Maritime Sciences, Japan*

²*Kobe Marine Technical College, Japan*

Waves In The Southern Great Barrier Reef

Jasmine Jaffrés¹; Malcolm Heron¹; Andrew Middleditch²; Craig Steinberg³; Tom Durrant⁴

¹*Marine Geophysical Laboratory, James Cook University, Australia*

²*Seaview Sensing Ltd, UK*

³*Australian Institute of Marine Science*

⁴*Australian Bureau of Meteorology*

What Is Driving The Fast Warming Rate Of The Southern Hemisphere Midlatitude Ocean?

Timothy Cowan¹; Wenju Cai¹; Susan Wijffels²; Stuart Godfrey¹

¹*CSIRO Marine & Atmospheric Research, Australia*

²*CSIRO Wealth from Oceans Flagship, Australia*

Statistical Clustering Of Curves In The Geosciences - The Answer To Everything?

Les Hamilton

Defence Science & Technology Organisation, Australia

Characterization Of Suspended Particles Collected From An Estuary In An Urban And Industrialised Centre Using Magnets Onboard An Autonomous Underwater Vehicle

Paulo de Souza¹; Edward Butler²; Andrew Davie¹; Greg Timms¹; Vijayendra Garg³

¹*Tasmanian Information & Communication Technologies Centre, Australia*

²*CSIRO Wealth from Oceans Flagship, Australia*

³*Instituto de Fisica, Universidade de Brasilia, Brazil*

Sessions/Papers by Day/Time

Underwater communications 3

Wednesday, 10:45 AM - 12:30 PM

CO-Chairs:

Milica Stojanovic, *Northeastern University, USA*

Estimation And Compensation Of Doppler Effect In UAC OFDM Systems

Sadia Ahmed; Huseyin Arslan
University of South Florida, USA

Capacity Of Underwater Acoustic OFDM Cellular Networks

Balakrishnan Srinivasan; Volkan Rodoplu
University of California Santa Barbara, USA

Alamouti Space Time Coded OFDM For Underwater Acoustic Channels

Baosheng Li; Milica Stojanovic
Northeastern University, USA

Progressive Inter-Carrier Interference Equalization For OFDM Transmission Over Time-Varying Underwater Acoustic Channels

Jianzhong Huang¹; Shengli Zhou¹; Jie Huang¹; Christian Berger²; Petter Willett¹
¹*University of Connecticut, USA*
²*Carnegie Mellon University, USA*

Comparison Of Basis Pursuit Algorithms For Sparse Channel Estimation In Underwater Acoustic OFDM

Jianzhong Huang¹; Christian Berger²; Shengli Zhou¹; Jie Huang¹
¹*University of Connecticut, USA*
²*Carnegie Mellon University, USA*

Sessions/Papers by Day/Time

Advances in underwater imaging and mapping

Wednesday, 10:45 AM - 12:30 PM

C0-Chairs:

Marc Pinto, *NURC*

Preliminary Investigations Using A Helicopter Time-Domain System For Bathymetric Measurements And Depth-To-Bedrock Estimation In Shallow Coastal Waters - A Case Study In Broken Bay, Australia

Julian Vrbancich

Defence Science & Technology Organisation, Australia

Overview Of Australian R & D For Acoustic Mine Imaging

Ronald Wyber

Midspar Systems, Australia

Interferometric Synthetic Aperture Sonar In Pipeline Inspection

Roy Hansen¹; Torstein Sabo¹; Per Hagen²; Hayden Callow¹

¹*Norwegian Defence Research Establishment*

²*Kongsberg Maritime, Norway*

Autonomous Detection And Volume Determination Of Tubeworm Colonies From Underwater Robotic Surveys

Toshihiro Maki; Ayaka Kume; Tamaki Ura; Takashi Sakamaki; Hideyuki Suzuki

University of Tokyo, Japan

Development Of A Landing Algorithm For Autonomous Underwater Vehicles Using Laser Profiling

Mehul Sangekar; Blair Thornton; Tamaki Ura; Takeshi Nakatani

Underwater Robotics & Application Laboratory, University of Tokyo, Japan

Sessions/Papers by Day/Time

Vehicle navigation 2

Wednesday, 10:45 AM - 12:30 PM

C0-Chairs:

Jenhwa Guo, *Department of Engineering Science and Ocean Engineering, National Taiwan University*

Hsin-Hung Chen, *National Sun Yat-sen University, Taiwan*

Study On Underwater Terrain Matching Positioning Based On The Integration Of TERCOM And MCTM

Jianhu Zhao¹; Kai Zhang¹; Hongmei Zhang¹; Kun Yang²

¹*School of Geodesy and Geomatics, Wuhan University, China*

²*Tianjin Research Institute For Water Transport Engineering, China*

Deep-Sea AUV Navigation Using Side-Scan Sonar Images And SLAM

Philipp Woock; Christian Frey

Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, Germany

Study On The Underwater Geomagnetic Navigation Based On The Integration Of TERCOM And K-Means Clustering Algorithm

Shengping wang¹; Hongmei Zhang²; Kun Yang³; Chunhe Tian³

¹*School of Geodesy and Geomatics, Wuhan University, China*

²*School of Power and Mechanical Engineering, Wuhan University, China*

³*Tianjin Research Institute For Water Transport Engineering, China*

Seabed Topographic Contour Match Based On Angle Code Technique

Hongmei Zhang¹; Jianhu Zhao²; Kun Yang³; Chunhe Tian³

¹*Automation Department, Wuhan University, China*

²*School of Geodesy and Geomatics, Wuhan University, China*

³*Tianjin Research Institute For Water Transport Engineering, China*

Map Uncertainties For Unmanned Underwater Vehicle Navigation Using Sidescan Sonar

Jenhwa Guo¹; WH Wang³; SW Huang²; Edward Chen²; FC Chiu³

¹*Department of Engineering Science and Ocean Engineering, National Taiwan University*

²*Taiwan Ocean Research Institute*

³*National Taiwan University*

Sessions/Papers by Day/Time

Remotely operated vehicles

Wednesday, 10:45 AM - 12:30 PM

C0-Chairs:

Shinichi Takagawa, *Institute of Industrial Science, University of Tokyo, Japan*

Tomoya Inoue, *Japan Agency for Marine-Earth Science and Technology*

Flipper Type Crawler System For Running On The Irregular Seafloor

Tomoya Inoue¹; Takuya Shiosawa²; Ken Takagi²

¹*Japan Agency for Marine-Earth Science and Technology*

²*Japan Agency for Marine-Earth Science and Technology / University of Tokyo*

Development Of A Human-Sized ROV With Dual-Arm

Norimitsu Sakagami¹; Mizuho Shibata²; Yuuta Hagiwara²; Kouhei Ishimaru²; Tomohiro Ueda²; Takayuki Saito²; Kazuhiro Fujita²; Hideki Hashizume²; Toshifumi Inoue³; Shigeo Murakami³; Hiroyuki Onishi³; Sadao Kawamura²

¹*Tokai University, Japan*

²*Ritsumeikan university, Kyoto, Japan*

³*Dainippon Screen Manufacturing, Japan*

A New Concept Design Of Heave Compensation System For Longer Life Of Cables

Shinichi Takagawa

Institute of Industrial Science, University of Tokyo, Japan

Deep Water ROV Design For The Mexican Oil Industry

Tomas Salgado-Jimenez; Jose Luis Gonzalez-Lopez; Luis Martinez-Soto; Edgar Olguin Lopez; Pedro Resendiz Gonzalez; Manuel Bandala-Sanchez

Center for Engineering and Industrial Development (CIDESI), Mexico

Sessions/Papers by Day/Time

Classification and pattern recognition

Wednesday, 10:45 AM - 12:30 PM

C0-Chairs:

Phil Chapple, *DSTO*

False-Alarm Reduction In Mine Classification Using Multiple Looks From A Synthetic Aperture Sonar

Johannes Groen; David Williams; Enrique Coiras
NATO Undersea Research Centre

Detection Of Buried And Partially Buried Objects Using A Bio-Inspired Wideband Sonar

Chris Capus; Yan Pailhas; Keith Brown; David Lane
Heriot-Watt University, UK

Featureless Classification For Active Sonar Systems

Mary Soules; Joshua Broadwater
Johns Hopkins University Applied Physics Laboratory, USA

Towards Generalized Benthic Species Recognition And Quantification Using Computer Vision

Adam Gobi
Memorial University of Newfoundland, Canada

Sessions/Papers by Day/Time

Hydrography / seafloor mapping / geodesy

Wednesday, 1:30 PM - 3:15 PM

C0-Chairs:

Magnus Wettle, *Geoscience Australia*

Jianhu Zhao, *School of Geodesy and Geomatics, Wuhan University, China*

Mapping The Fine-Scale Shallow Water Bathymetry Of The Great Barrier Reef Using ALOS AVNIR-2 Data

Stephen Sagar; Magnus Wettle

Geoscience Australia

Mapping The Coastal Bathymetry With FORMOSAT-2 Image

Shih-Jen Huang¹; Nan-Jung Kuo¹; Chung-Ru Ho¹; Cheng-Han Tsai¹; Hsien-Wen Li²; Yao-Tsai Lo¹; Dong-Jiing Doong¹; Hung-Jen Lee¹; Young-Zehr Kehr³

¹*Department of Marine Environmental Informatics, National Taiwan Ocean University*

²*Department of Civil Engineering and Environmental Informatics, Minghsin University of Science and Technology, Taiwan*

³*Department of Systems Engineering and Naval Architecture, National Taiwan Ocean University*

Evaluation Of An Off-The-Shelf Acoustic System For Precision Positioning Of Seabed Transponders

Hsin-Hung Chen¹; Chau-Chang Wang²; Jia-Pu Jang³

¹*National Sun Yat-sen University, Taiwan*

²*National Sun Yat-sen University, Taiwan*

³*Taiwan Ocean Research Institute*

Software Development For The Determination And Transfer Of Chart Datum

Jianhu Zhao¹; Hao Ke¹; Baohua Xu²; Fengnian Zhou²

¹*School of Geodesy and Geomatics, Wuhan University, China*

²*Survey Bureau of Hydrology and Water Resources of Changjiang Estuary, China*

Sessions/Papers by Day/Time

Sonar signal processing 2 **Wednesday, 1:30 PM - 3:15 PM**

C0-Chairs:

Peter Gough, *Acoustics Research Group, University of Canterbury, New Zealand*

Localisation And Tracking Of Underwater Acoustic Source Using A Modified Particle Filter

Dragana Carevic

Defence Science & Technology Organisation, Australia

Underwater Acoustic Sensor Localization Using A Broadband Sound Source In Uniform Linear Motion

Kam Lo; Brian Ferguson

Defence Science & Technology Organisation, Australia

Comparing Of LPC-EKF, LPC-UKF In UUV Bearings-Only Tracking Systems

Jin Xu; Shenzhen Ren; Xisheng Feng; Changlong Lin

Shenyang Institute of Automation, Chinese Academy of Sciences

A Sweeper Scheme For Localization And Mobility Prediction In Under Water Acoustic Sensor Networks

Dharan Kuppusamy¹; Soo Park²; Srimathi Chandhrasekaran¹

¹*Vellore Institute of Technology, India*

²*Kookmin University, South Korea*

Passive Localization Of An Autonomous Underwater Vehicle With Periodic Sonar Signaling

Zhiguo Yang; Wen Xu; Zhuan Xiao; Xiang Pan

Zhejiang University, China

Sessions/Papers by Day/Time

Advances in integrated marine observing systems 2

Wednesday, 1:30 PM - 3:15 PM

CO-Chairs:

Simon Allen, *University of Tasmania*

The Australian IMOS Southern Ocean Time Series Facility

Thomas Trull¹; Eric Schulz²; Stephen Bray¹; Lindsay Pender³; Danny McLaughlan³; Bronte Tilbrook³; Mark Rosenberg¹; Tim Lynch³

¹*Antarctic Climate & Ecosystems Cooperative Research Centre, Australia*

²*Australian Bureau of Meteorology*

³*CSIRO Marine & Atmospheric Research, Australia*

The Lucinda Jetty Coastal Observatory's Role In Satellite Ocean Colour Calibration And Validation For Great Barrier Reef Coastal Waters.

Vittorio Brando¹; Rex Keen¹; Paul Daniel¹; Adam Baumeister¹; Matt Nethery¹; Henry Baumeister¹; Aaron Hawdon¹; Garry Swan¹; Ross Mitchell²; Susan Campbell²; Thomas Schroeder¹; Young Park¹; Rebecca Edwards¹; Andy Steven¹; Simon Allen²; Lesley Clementson²; Arnold Dekker¹

¹*CSIRO Land & Water, Australia*

²*CSIRO Marine & Atmospheric Research, Australia*

The Wave Glider, A Persistent Platform For Ocean Science

Justin Manley; Scott Willcox

Liquid Robotics, USA

Sustained Oceanographic Observations Around Australia Using Autonomous Ocean Gliders

Ben Hollings; Charitha Pattiaratchi; Mun Woo; Christine Hanson

University of Western Australia

Bright Blue: Advanced Technologies For Marine Environmental Monitoring And Offshore Energy

Richard Camilli; Andrew Bowen; Norman Farr

Woods Hole Oceanographic Institution, USA

Sessions/Papers by Day/Time

Vehicle design 1

Wednesday, 1:30 PM - 3:15 PM

C0-Chairs:

Hayato Kondo, *Tokyo University of Marine Science and Technology, Japan*

Yun Hae Kim, *Korea Maritime University*

Material Design Of Al/CFRP Hybrid Composites For The Hull Of Autonomous Underwater Vehicle

Yun Hae Kim¹; Young dae Jo¹; Sung youl Bae²; Seokjin Sin¹; Kyung man Moon¹; Min Jung Kim¹

¹*Korea Maritime University*

²*Korean Register of Shipping*

New Ceramic Pressure Hull Design For Deep Water Applications

Shinichi Takagawa

Institute of Industrial Science, University of Tokyo, Japan

Hull Form Design Of Underwater Vehicle Applying CFD

Tomoya Inoue¹; Hiroyoshi Suzuki²; Risa Kitamoto²; Yoshitaka Watanabe¹; Hiroshi Yoshida¹

¹*Japan Agency for Marine-Earth Science and Technology*

²*Osaka University, Japan*

Pressure Tolerant Systems For Deep Sea Applications

Martin Lueck¹; Moritz Buscher¹; Heinz Lehr¹; Carl Thiede²; Gerhard Körner³; Jochen Martin³; Marion Schlichting³; Siegfried Krüger⁴; Hartmut Huth⁴

¹*Department for Electromechanical and Optical Systems, Technical University Berlin, Germany*

²*ENITECH Energietechnik-Elektronik GmbH, Germany*

³*ENITECH Energietechnik-Elektronik GmbH*

⁴*Leibniz Institut for Baltic Sea Research Warnemünde, Germany*

Autonomic Element Based Architecture For Unmanned Underwater Vehicles

Changlong Lin; Shenzhen Ren; Xisheng Feng; Yiping Li; Jinbao Xu

Shenyang Institute of Automation, Chinese Academy of Sciences

Sessions/Papers by Day/Time

Signal coherence and fluctuation

Wednesday, 1:30 PM - 3:15 PM

CO-Chairs:

Adrian Jones, *Defence Science & Technology Organisation, Australia*

Experimental Study Of The Space-Time Properties Of Acoustic Channels For Underwater Communications

Beatrice Tomasi¹; Giovanni Zappa²; Kim McCoy²; Paolo Casari¹; Michele Zorzi¹

¹*University of Padova, Italy*

²*NATO Undersea Research Centre*

Temporal Variation Of The Statistical Properties Of An Underwater Acoustic Channel Measured At A Shallow Water In 2009

Sea-Moon Kim; Sung-Hoon Byun; Seung-Geun Kim; Yong-Kon Lim

Maritime & Ocean Engineering Research Institute / Korea Ocean Research & Development Institute

The High Frequency Underwater Acoustic Channel

Craig Benson; Timothy Hajenko

University of New South Wales, Australia

Improving Resolution And SNR Of Correlation Function With The Increase In Bandwidth Of Recorded Noise Fields During Estimation Of Bottom Profile Of Ocean

Md Jahangir Alam; Michael Frater; Elanor Huntington

Australian Defence Force Academy

Sessions/Papers by Day/Time

Marine optics technology and instrumentation

Wednesday, 1:30 PM - 3:15 PM

C0-Chairs:

John Watson, *University of Aberdeen*

David Farrant, *CSIRO Materials Science & Engineering, Australia*

Automated Three-Dimensional Measurement Method Of In Situ Fish With A Stereo Camera

Jun Han¹; Akira Asada¹; Hideyuki Takahashi²; Kouichi Sawada²

¹*University of Tokyo, Japan*

²*National Research Institute of Fisheries Engineering, Japan*

A Combined Acoustic And Optical Instrument For Fisheries Studies

Matthew Sherlock; Tim Ryan; Rudy Kloser

CSIRO Marine & Atmospheric Research, Australia

The Low Distortion All-Around View System Using The Fisheye Lens For An Underwater Vehicle

Shojiro Ishibashi

Japan Agency for Marine-Earth Science and Technology

Evaluation Of Using A CCD Camera As A Measurement System For Flume Tank Observation

Chau-Chang Wang¹; Po-Chi Chen²; Hsin-Hung Chen³; Wen-Li Chang³

¹*Institute of Applied Marine Physics and Undersea Technology, National Sun Yat-sen University, Taiwan*

²*Taiwan Ocean Research Institute*

³*Institute of Applied Marine Physics and Undersea Technology, National Sun Yat-sen University, Taiwan*

Sessions/Papers by Day/Time

Ocean energy and offshore structures

Wednesday, 1:30 PM - 3:15 PM

C0-Chairs:

David Griffin, *CSIRO Wealth from Oceans Flagship, Australia*

Evan Zimmerman, *Delmar, USA*

Ocean Power For Australia - Waves, Tides And Ocean Currents

David Griffin; Mark Hemer

CSIRO Wealth from Oceans Flagship, Australia

A Preliminary Analysis Of The Effect Of The Onset Flow Structure On Tidal Turbine Blade Loads

Ian Milne; Rajnish Sharma; Richard Flay; Simon Bickerton

University of Auckland, New Zealand

Progress In The Development Of A Multi-Mode Self-Reacting Wave Energy Converter

Lan Le-Ngoc¹; Alister Gardiner¹; Robert Stuart¹; Alan Caughley¹; John Huckerby²

¹*Industrial Research Ltd, New Zealand*

²*Power Projects Ltd, New Zealand*

Risk Management Of Moored Mobile Offshore Drilling Units In The Western Pacific Ocean

Evan Zimmerman; Daniel Alonso

Delmar, USA

Sessions/Papers by Day/Time

Oceanography 2

Wednesday, 3:45 PM - 5:30 PM

C0-Chairs:

Damian Ogburn, *URS Australia*

Sirod Sirisup, *National Electronics and Computer Technology Center, Thailand*

Coastal Ocean Simulation Of The Gulf Of Thailand: A Case Study Of Finite Volume Coastal Ocean Model

Saifhon Tomkratoke; Sirod Sirisup

National Electronics and Computer Technology Center, Thailand

Modeling Of Turbulence Prandtl Number In Stationary And Homogeneous Stratified Turbulence

Shinichiro Hirabayashi; Toru Sato

University of Tokyo, Japan

Case Study Of Phytoplankton Blooms In Serangoon Harbor Of Singapore

Nicholas Patrikalakis¹; Paola Malanotte-Rizzoli¹; Pavel Tkalich²; Wonjoon Cho¹; Boon Hooi Ooi³; Haining Zheng¹; Kevin Yue¹; Hanna Kurniawati³; Palani Sundarambal⁴; My Ha Dao⁴; Roopsekhar Karanam⁴; Jun Wei¹

¹*Massachusetts Institute of Technology, USA*

²*National University of Singapore*

³*Singapore - MIT Alliance for Research and Technology*

⁴*Tropical Marine Science Institute, National University of Singapore*

Modeling Of The Climate And Anthropogenic Influences To The Eutro-Dynamics In Dapen Bay, Taiwan

Chia-Shun Yu; Pei-Hung Chen; Hau-Chen Yu

National Sun Yat-sen University, Taiwan

Mapping The Fish Fry Feeding Prism In A Saltmarsh-Estuary Ecotone

Damian Ogburn¹; Thomas Zeng²

¹*URS Australia*

²*Sydney University, Australia*

Sessions/Papers by Day/Time

Underwater communications 4

Wednesday, 3:45 PM - 5:30 PM

C0-Chairs:

Craig Benson, *University of New South Wales, Australia*

Shengli Zhou, *University of Connecticut*

On The Effects Of Node Density And Duty Cycle On Energy Efficiency In Underwater Networks

Francesco Zorzi¹; Milica Stojanovic²; Michele Zorzi¹

¹*University of Padova, Italy*

²*Northeastern University, USA*

Optimizing Network Performance Through Packet Fragmentation In Multi-Hop Underwater Communications

Roberto Petrocchia¹; Milica Stojanovic²; Stefano Basagni²; Chiara Petrioli¹

¹*La Sapienza, University of Rome, Italy*

²*Northeastern University, USA*

COPE-MAC: A Contention-Based Medium Access Control Protocol With Parallel Reservation For Underwater Acoustic Networks

Zheng Peng; Yibo Zhu; Zhong Zhou; Zheng Guo; Jun-Hong Cui

University of Connecticut, USA

A Cooperative ARQ Scheme In Underwater Acoustic Sensor Networks

Ho-Shin Cho; Jae Won Lee; Jin Yong Cheon

Kyungpook National University, Korea

Opportunistic ARQ With Bidirectional Overhearing For Reliable Multihop Underwater Networking

Haojie Zhuang; Hwee-Pink Tan; Alvin Valera; Zijian Bai

*Institute for Infocomm Research, Agency for Science, Technology & Research (A*STAR), Singapore*

Sessions/Papers by Day/Time

Bioacoustics

Wednesday, 3:45 PM - 5:30 PM

C0-Chairs:

Douglas Cato, *Defence Science & Technology Organisation / University of Sydney, Australia*

Classification Of A Large Collection Of Indo-Pacific Humpback Dolphin (*Sousa chinensis*) Whistles

Paul Seekings; Kian Yeo; Paul Chen; Suranga Nanayakkara; Jolyn Tan; Petrina Tay; Elizabeth Taylor
Marine Mammal Research Laboratory, Tropical Marine Science Institute, National University of Singapore

Automatic Discrimination Of Beaked Whale Clicks In Long Noisy Acoustic Time Series

Les Hamilton; Jane Cleary
Defence Science & Technology Organisation, Australia

Modelling Backscatter Of Marine Mammal Bio-Mimetic Sonar Signals From Bubble Clouds

Kian Yeo¹; Elizabeth Taylor¹; S Ong²
¹*Tropical Marine Science Institute, National University of Singapore*
²*National University of Singapore*

Long-Term Real-Time Monitoring Of Free-Ranging Bottlenose Dolphins (*Tursiops truncatus*) In An Aquarium Using 5-Hydrophone Array System

Harumi Sugimatsu¹; Tamaki Ura¹; Junichi Kojima²; Hiroshi Shimura³; Kenji Maejima³; Koichi Kato³; Yuki Tahara³; Ayako Takahashi³; Shizuko Hiryu⁴; Emyo Fujioka⁴; Yoshiaki Watanabe⁴
¹*Institute of Industrial Science, University of Tokyo*
²*KDDI R&D Laboratories Inc., Japan*
³*Izu Mito Sea Paradise Co., Ltd., Japan*
⁴*Doshisha University, Japan*

Sessions/Papers by Day/Time

Collaborative autonomous vehicles 1

Wednesday, 3:45 PM - 5:30 PM

C0-Chairs:

David Lane, *SeeByte Ltd, UK*

Michael Jakuba, *Australian Centre for Field Robotics, University of Sydney, Australia*

Collaborative Multi-Vehicle Localization And Mapping In Marine Environments

Diluka Moratuwage¹; Wijerupage Wijesoma¹; Bharath Kalyan¹; Jun Dong¹; P.G. Chaminda Senarathne¹; Franz Hover²; Nicholas Patrikalakis²

¹*Nanyang Technological University, Singapore*

²*Massachusetts Institute of Technology, USA*

Event-Based Motion Coordination Of Multiple Underwater Vehicles Under Disturbances

Pedro Teixeira¹; Dimos Dimarogonas²; Karl Johansson³; João Sousa¹

¹*Underwater Systems and Technologies Laboratory, Faculty of Engineering, University of Porto, Portugal*

²*Massachusetts Institute of Technology, USA*

³*Royal Institute of Technology, Sweden*

Multi-AUV Coordination In The Underwater Environment With Obstacles

Yan Yang; Shuxin Wang; Zhiliang Wu

Tianjin University, China

Collision Free Formation Control For Multiple Autonomous Underwater Vehicles

Shibo Fan; Zhengping FENG; Lian LIAN

State Key Laboratory of Ocean Engineering, Shanghai Jiao Tong University, China

A Low Cost Test Bed Of Underwater Mobile Sensing Network

Zhengping Feng; Guiyang Shang; Lian Lian

Shanghai Jiao Tong University, China

Sessions/Papers by Day/Time

Automatic control

Wednesday, 3:45 PM - 5:30 PM

C0-Chairs:

Chau-Chang Wang, *Institute of Applied Marine Physics and Undersea Technology, National Sun Yat-sen University, Taiwan*

Nuno Cruz, *Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal*

Auto-Heading Controllers For An Autonomous Sailboat

Nuno Cruz; José Alves

Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal

A Sub-Region Tracking Control For An Underwater Vehicle-Manipulator System With A Sub-Task Objective

Zool Ismail; Matthew Dunnigan

School of Engineering and Physical Sciences, Heriot-Watt University, UK

Trajectory Tracking For Marine Vehicles Under Constant Disturbances: Controller Design And Tuning

Mernout Burger; Kristin Pettersen

Norwegian University of Science and Technology

Depth Control Of An Autonomous Underwater Vehicle, STARFISH

You Hong Eng¹; Geok Soon Hong²; Mandar Chitre¹

¹*Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

²*National University of Singapore*

A Dynamic Compensation Mechanism For Contactless Power Transfer Systems

Wei Gu; Wangqiang Niu; Jianxin Chu; Jianhua Wang

Shanghai Jiao Tong University, China

Sessions/Papers by Day/Time

Sonar imaging

Wednesday, 3:45 PM - 5:30 PM

C0-Chairs:

Roy Hansen, *Norwegian Defence Research Establishment*

Didier Gueriot, *Télécom Bretagne, France*

Forward Looking Sonar Data Simulation Through Tube Tracing

Didier Gueriot; Christophe SINTES

Télécom Bretagne, France

3D Reconstruction Of Underwater Scenes Using Image Sequences From Acoustic Camera

Naouraz Brahim¹; Didier Guériot¹; Sylvie Daniel²

¹*Télécom Bretagne, France*

²*Université Laval, Canada*

Study On The Fusion Of MBS Image And SSS Image

Hongmei Zhang¹; Jianhu Zhao²; Kun Yang³

¹*Automation Department, Wuhan University, China*

²*School of Geodesy and Geomatics, Wuhan University, China*

³*Tianjin Research Institute For Water Transport Engineering, China*

Study On Side Scan Sonar Image Matching Based On The Integration Of Surf And Similarity Calculation Of Typical Areas

Jianhu Zhao¹; Weiliang Tao¹; Hongmei Zhang¹; Kun Yang²

¹*Wuhan University, China*

²*Tianjin Research Institute For Water Transport Engineering, China*

On Methods Of Multi-Beam Data Error Correction

Yongting Wu¹; Yinan Chen²; Kun Yang³; Jisheng Ding³; Qiuhua Tang³

¹*School of Geodesy and Geomatics, Wuhan University / First Institute of Oceanography, State Oceanic Administration, China*

²*First Institute of Oceanography, State Oceanic Administration, China*

³*Tianjin Research Institute For Water Transport Engineering, China*

Sessions/Papers by Day/Time

Marine safety

Wednesday, 3:45 PM - 5:30 PM

C0-Chairs:

Etsuro Shimizu, *Tokyo University of Marine Science and Technology, Japan*

Eiichi Kobayashi, *Kobe University, Japan*

Basic Study On Construction Of Visual Evaluation System For Safety Ship

Navigation

Hiddenari Makino; Eiichi Kobayashi; Nobukazu Wakabayashi; Shigeaki Shiotani

Kobe University, Japan

Navigator's Decision-Making And Action Model - Synthetically Subjective Risk Of Collision

Takashi Kubota¹; Nobuyoshi Kouguchi²

¹*Oshima National College of Maritime Technology, Japan*

²*Faculty of Maritime Sciences, Kobe University, Japan*

Proposal Of New Generation Route Optimization Technique For An Oceangoing Vessel

Eriko Ishii; Eiichi KOBAYASHI ; Takashi Mizunoe; Atsuo Maki

Kobe University, Japan

Drift Track Simulations For Past Marine Incidents Using SARMAP

Tse-Nung Chu; Cheng-Hang Tsai

National Taiwan Ocean University

Field Observation On Actual Lightering Operations

Etsuro Shimizu¹; Egil Pedersen²

¹*Tokyo University of Marine Science and Technology, Japan*

²*Norwegian University of Science and Technology*

Sessions/Papers by Day/Time

Naval architecture

Thursday, 8:30 AM - 10:15 AM

C0-Chairs:

Daniel Rolland, *Alion Science and Technology, USA*

Shigeaki Shiotani, *Kobe University, Japan*

Measurement And Estimation Of Waves Generated By A Small Ship In Port

Shigeaki Shiotani

Kobe University, Japan

Hydrodynamic Forces And Moment Acting On A Submersible Surface Ship In Vertical Motion

Michio Ueno; Yoshiaki Tsukada; Hiroshi Sawada

National Maritime Research Institute, Japan

Reducing Bubble Sweepdown Effects On Research Vessels

Daniel Rolland; Pamela Clark

Alion Science and Technology, USA

Propulsion System Considerations For Research Vessels

Daniel Rolland; Pamela Clark

Alion Science and Technology, USA

Optimal Modeling Of Ship Moving

Inna Elyukhina¹; Leonid Kholpanov²; Albert Khomyakov³

¹*South Ural State University, Russia*

²*Institute of Problems of Chemical Physics, Russian Academy of Science*

³*Krylov Shipbuilding Research Institute, Russia*

Sessions/Papers by Day/Time

Sonar signal processing 3

Thursday, 8:30 AM - 10:15 AM

C0-Chairs:

Douglas Abraham, *CausaSci LLC, USA*

Christian de Moustier, *HLS Research, Inc., USA*

Uncertainty In Bearing Estimation With The Volume Search Sonar

Christian de Moustier

HLS Research, Inc., USA

Adaptive Motion-Compensated Temporal Filtering Of Sector Scan Sonar Image Sequences

Bin Shen¹; Stuart Perry²; Donald Fraser³

¹*Defence Science & Technology Organisation, Australia*

²*Canon Information Systems Research Australia*

³*Australian Defence Force Academy*

A Simulation Model Of The Pulse Echo Returns For A Short-Range SAS

Peter Gough; Michael HAYES

Acoustics Research Group, University of Canterbury, New Zealand

Simulation On Large Scale Of Acoustic Signals For Array Processing

Gerard Llort-Pujol; Christophe Sintès; Thierry Chonavel; Didier Guériot; René Garelo

Télécom Bretagne, France

K-Rayleigh Mixture Model For Sparse Active Sonar Clutter

Douglas Abraham¹; James Gelb²; Andrew Oldag²

¹*CausaSci LLC, USA*

²*Applied Research Laboratories, University of Texas, USA*

Sessions/Papers by Day/Time

Advances in understanding of marine environments in the Western Pacific 1

Thursday, 8:30 AM - 10:15 AM

CO-Chairs:

Yusaku Kyojuka, *Kyushu University, Japan*

Dong-Jiing Doong, *Department of Marine Environmental Informatics, National Taiwan Ocean University*

Laboratory Verification On Waveform Inversion Of An Internal Solitary Wave In The South China Sea

M.-H. Cheng; John Hsu

Department of Marine Environment and Engineering, National Sun Yat-sen University, Taiwan

Numerical Simulation Of Tidal Currents Around Korea/Japan Strait And Application To Speed Trial

Hee-Su Lee¹; Jong-Chun Park¹; Dai-Hyun Choi²; Se-min Jeong³; Shigeru Tabeta³; Shinichiro Hirabayashi³

¹*Pusan National University, Korea*

²*Samsung Heavy Industries, Korea*

³*University of Tokyo, Japan*

A Finite Element Model Of Propagation On The Southern And Western Australian Continental Shelf

Marcia Isakson; Nicholas Chotiros

Applied Research Laboratories, University of Texas, USA

Numerical Simulation Of Dispersion Of Volcanic CO₂ Seeped From Seafloor By Using Multi-Scale Ocean Model

Muneyasu Harata; Toru Sato; Shinichiro Hirabayashi

University of Tokyo, Japan

Numerical Simulation Of Tidal Currents Around Keelung Sill Off Northern Taiwan

Hsien-Wen Li¹; Yao-Tsai Lo²; Cheng-Han Tsai²; Nan-Jung Kuo²; Chung-Ru Ho²; Dong-Jiing Doong²; Shih-Jen Huang²; Hung-Jen Lee²; Young-Zehr Kehr³

¹*Department of Civil Engineering and Environmental Informatics, Minghsin University of Science and Technology, Taiwan*

²*Department of Marine Environmental Informatics, National Taiwan Ocean University*

³*Department of Systems Engineering and Naval Architecture, National Taiwan Ocean University*

Sessions/Papers by Day/Time

Autonomous underwater vehicles 4

Thursday, 8:30 AM - 10:15 AM

CO-Chairs:

Mike Eichhorn, *National Research Council Canada*

Jose Mare, *ATSA Defence Services, Australia*

Path Following Algorithm For Minimally Specified Lawn-Mower Type AUV

Missions

Jose Mare

ATSA Defence Services, Australia

Coverage Path Planning For Harbour Surveys Using An AUV

Chengle Fang¹; Stuart Anstee²

¹*University of Sydney, Australia*

²*Defence Science & Technology Organisation, Australia*

Path Planning Of Autonomous Underwater Vehicles For Optimal Environmental Sampling

Feng Sun; Wen Xu; Liling Jin; Jianlong Li

Zhejiang University, China

Path Planning For Gliders Using Regional Ocean Models: Application Of Pinzón Path Planner With The ESEOAT Model And The RU27 Trans-Atlantic Flight Data

Enrique Fernández-Perdomo¹; Jorge Cabrera-Gámez²; Daniel Hernández-Sosa²; Josep Isern-González²; Antonio Domínguez-Brito²; Alex Redondo³; Josep Coca³; Antonio Ramos³; Enrique Álvarez Fanjul⁴; Marcos García Sotillo⁴

¹*University Institute of Sistemas Inteligentes y Aplicaciones Numéricas en Ingeniería (SIANI), Spain*

²*University Institute of Sistemas Inteligentes y Aplicaciones Numéricas en Ingeniería (SIANI), Spain*

³*Department of Biology, Universidad de Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain*

⁴*Organismo Público Puertos del Estado, Spain*

A Mission Planning System For The AUV "SLOCUM Glider" For The Newfoundland And Labrador Shelf

Mike Eichhorn¹; Ralf Bachmayer²; Brad Young²; Christopher Williams³

¹*National Research Council Canada*

²*Memorial University of Newfoundland, Canada*

³*Institute for Ocean Technology, National Research Council Canada*

Sessions/Papers by Day/Time

Data assimilation and information management

Thursday, 8:30 AM - 10:15 AM

C0-Chairs:

David Griffin, *CSIRO Wealth from Oceans Flagship, Australia*

Nugzar Margvelashvili, *CSIRO Marine & Atmospheric Research, Australia*

Development Of Operational Data-Assimilating Water Quality Modelling System For South-East Tasmania

Nugzar Margvelashvili; Mike Herzfeld; John Andrewartha; Farhan Rizwi; John Parslow; Emlyn Jones; Karen Wild-Allen

CSIRO Marine & Atmospheric Research, Australia

An Operational System For The Forecasting Of Oceanographic Conditions In The Nazare Canyon Area (W Portugal)

Joao Vitorino; Sergio Larangeiro; Francisco Silva; José Pinto; Sara Almeida

Instituto Hidrografico, Portugal

Software Development For The Determination Of Instantaneous Height Of Transducer Based On The Blend Of GPS Height And Heave

Hongmei Zhang¹; Jianhu Zhao²; Baohua Xu³

¹*Automation Department, Wuhan University, China*

²*School of Geodesy and Geomatics, Wuhan University, China*

³*Survey Bureau of Hydrology and Water Resources of Changjiang Estuary, China*

WfSAT: A Web Based Fish Stock Assessment Tools For Generating Fish Statistical Population Information Using Fish Length Method

Mustafa Man¹; Mohammad Zaidi Zakaria²; Fakhru Adli Mohd Zaki³

¹*Department of Computer Sciences, Universiti Malaysia Terengganu*

²*Department of Fisheries Science and Aquaculture, Universiti Malaysia Terengganu*

³*Department of Computer Science, Universiti Malaysia Terengganu*

SIDIF: Location Based Technique For Spatial Information Databases Integration Framework

Mustafa Man¹; Zailani Mohamed Sidek²; Md Yazid Mohd Saman³; Muhammad Zaidi Zakaria³

¹*Department of Computer Sciences, Universiti Malaysia Terengganu*

²*Universiti Teknologi Malaysia*

³*Universiti Malaysia Terengganu*

Sessions/Papers by Day/Time

Systems and observatories 2

Thursday, 8:30 AM - 10:15 AM

CO-Chairs:

Paulo de Souza, *Tasmanian Information & Communication Technologies Centre, Australia*

Arjuna Balasuriya, *Massachusetts Institute of Technology, USA*

Behavior-Based Planning And Prosecution Architecture For Autonomous Underwater Vehicles In Ocean Observatories

Arjuna Balasuriya; Stephanie Petillo; Henrik Schmidt; Michael Benjamin
Massachusetts Institute of Technology, USA

Development Of Seafloor Geodetic Observation System Based On AUV And Submarine Cable Technologies

Masashi Mochizuki¹; Akira Asada¹; Tamaki Ura¹; Zengo Yoshida¹; Kenichi Asakawa²; Takashi Yokobiki²; Ryoichi Iwase²; Tadanori Goto³; Masayuki Fujita⁴; Mariko Sato⁴; Oscar Colombo⁵; Teruki Tanaka⁶; Hong Zheng⁶; Kenji Nagahashi⁷

¹*Institute of Industrial Science, University of Tokyo, Japan*

²*Japan Agency for Marine-Earth Science and Technology*

³*Graduate School of Engineering, Kyoto University, Japan*

⁴*Hydrographic and Oceanographic Department, Japanese Coast Guard*

⁵*Goddard Earth Sciences and Technology Center - University of Maryland / NASA, USA*

⁶*SEA Corporation, Japan*

⁷*Underwater Engineering Department, Mitsui Engineering & Shipbuilding Co.,Ltd., Japan*

Acoustic Communications For Deep-Ocean Observatories: Results Of Initial Testing At The MBARI MARS Node

Lee Freitag; Keenan Ball; Peter Koski; Sandipa Singh; Eric Gallimore
Woods Hole Oceanographic Institution, USA

Marine Monitoring Using Fixed And Mobile Sensor Nodes

Paulo de Souza¹; Greg Timms¹; Andrew Davie¹; Ben Howell²; Stephen Giugni¹

¹*Tasmanian Information & Communication Technologies Centre, Australia*

²*Tasmanian ICT Centre*

Near-Optimal Collecting Data Strategy Based On Ordinary Kriging Variance

Xinke Zhu; Jiancheng Yu; Shenzhen Ren; Xiaohui Wang

Shenyang Institute of Automation, Chinese Academy of Sciences

Sessions/Papers by Day/Time

Marine radars and communications

Thursday, 8:30 AM - 10:15 AM

C0-Chairs:

Stuart Anderson, *Defence Science & Technology Organisation, Australia*

Nobukazu Wakabayashi, *Kobe University, Japan*

On The Detection Of Marine Mammals With Ship-Borne Polarimetric Microwave Radar

Stuart Anderson; James Morris

Defence Science & Technology Organisation, Australia

X-Band Radar Derived Sea Surface Elevation Maps As Input To Ship Motion Forecasting

Konstanze Reichert¹; Jens Dannenberg²; Henk van den Boom³

¹*OceanWaveS Pacific Ltd, New Zealand*

²*OceanWaveS GmbH, Germany*

³*Maritime Research Institute, Netherlands*

Development Of Radar Simulator Software Using AIS Data For Ship Data

Nobukazu Wakabayashi; Hidenari Makino; Kenji Mori; Shigeaki Shiotani

Kobe University, Japan

Performance Study On Delay Tolerant Networks In Maritime Communication Environments

Hao-Min Lin¹; Yu Ge²; Ai-Chun Pang¹; Jaya Pathmasuntharam²

¹*Department of Computer Science and Information Engineering, National Taiwan University*

²*Institute for Infocomm Research, Agency for Science, Technology & Research (A*STAR), Singapore*

A Theoretical Path Design For Long Range Over Ocean Microwave Links Using The Tropical Evaporation Duct

Andrew Kerans¹; Andrew Kulesa²; Graham Woods³; Andrew Clark¹

¹*Australian Communications & Media Authority*

²*Defence Science & Technology Organisation, Australia*

³*School of Engineering, James Cook University of North Queensland, Australia*

Sessions/Papers by Day/Time

Model based signal processing techniques

Thursday, 10:45 AM - 12:30 PM

C0-Chairs:

James Candy, *Lawrence Livermore National Laboratory, USA*

Christophe Sintes, *Telecom-Bretagne*

Range-Dependent Acoustic Tomography By Oceanic Feature Modeling For The Monitoring Of Upwelling (Cabo Frio, Brazil)

Olivier Carrière¹; Jean-Pierre Hermand¹; Leandro Calado²; Ana de Paula²; Ilson Almeida da Silveira³

¹*Environmental Hydroacoustics Laboratory, Université libre de Bruxelles, Belgium*

²*Marinha do Brasil - Instituto de Estudos do Mar Almirante Paulo Moreira, Brazil*

³*Instituto Oceanográfico da Universidade de São Paulo, Brazil*

Virtual Time-Reversal Processing For Source Localization In Shallow Water

Tongwei Zhang; Kunde Yang; Yuanliang Ma

Marine College, Northwestern Polytechnical University, China

Model-Based Detection Of Radioactive Contraband For Harbor Defense Incorporating Compton Scattering Physics

James Candy; David Chambers; Eric Breidfeller; Brian Guidry; Jerome Verbeke; Michael Axelrod; Kenneth Sale; Alan Meyer

Lawrence Livermore National Laboratory, USA

AUV Positioning Model Employing Acoustic And Visual Data Processing

Anton Myagotin¹; Igor Burdinsky²

¹*Institute of Marine Technology Problems, Russian Academy of Science*

²*Pacific National University, Russia*

Sessions/Papers by Day/Time

Underwater communications 5

Thursday, 10:45 AM - 12:30 PM

C0-Chairs:

Lee Freitag, *Woods Hole Oceanographic Institution, USA*

AquaTools: An Underwater Acoustic Networking Simulation Toolkit

Anuj Sehgal; Iyad Tumar; Jürgen Schönwälder
Jacobs University, Germany

Improved Estimation Procedure For Counting Neighbours In Underwater Networks

Md. Shafiul Howlader; Michael Frater; Michael Ryan
Australian Defence Force Academy

A Scheduling Algorithm For Wireless Networks With Large Propagation Delays

Mandar Chitre¹; Mehul Motani²; Shiraz Shahabudeen¹
¹*Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*
²*National University of Singapore*

Choosing Packet Size In Multi-Hop Underwater Networks

Roberto Petroccia¹; Milica Stojanovic²; Stefano Basagni²; Chiara Petrioli¹
¹*La Sapienza, University of Rome, Italy*
²*Northeastern University, USA*

An Integrated, Underwater Optical /Acoustic Communications System

Norman Farr; Andrew Bowen; Maurice Tivey; Jonathan Ware; Clifford Pontbriand
Woods Hole Oceanographic Institution, USA

Sessions/Papers by Day/Time

Advances in understanding of marine environments in the Western Pacific 2

Thursday, 10:45 AM - 12:30 PM

CO-Chairs:

Toru Sato, *University of Tokyo, Japan*

Beom-Soo Hyun, *Korea Maritime University*

Application Of The Wavelet Transform And Inverse Wavelet Transform To Analyze The Ocean Wave Signals From Data Buoys

Li-Chung Wu¹; Chia Chuen Kao¹; Dong-Jiing Doong²

¹*National Cheng Kung University, Taiwan*

²*National Taiwan Ocean University*

Searching For Freak Waves From In-Situ Buoy Measurements

Dong-Jiing Doong¹; Li-Chung Wu²

¹*Department of Marine Environmental Informatics, National Taiwan Ocean University*

²*National Cheng Kung University, Taiwan*

Infragravity Waves In The Hualien Harbor

Yi-Chung Yang; Cheng-Han Tsai

National Taiwan Ocean University

Heat Content And Steric Height Change In The Pacific Ocean

Takeshi Kawano; Toshimasa Doi; Shinya Kouketsu; Hiroshi Uchida; Masao Fukasawa; Yoshimi Kawai; Katsuro Katsumata

Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology

Estimation Of Exhaust Emissions Of Marine Traffic Using Automatic Identification System Data (Case Study: Madura Strait Area, Indonesia)

Trika Pitana¹; Eiichi Kobayashi²; Nobukazu Wakabayashi²

¹*Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia*

²*Graduate School of Maritime Sciences, Kobe University, Japan*

Sessions/Papers by Day/Time

Vehicle navigation 3

Thursday, 10:45 AM - 12:30 PM

CO-Chairs:

William Kirkwood, *mbari*

IMU-Aided Stereo Visual Odometry For Ground-Tracking AUV Applications

Marc Hildebrandt; Frank Kirchner

DFKI Bremen - Robotics Innovation Center, Germany

Long Range Acoustic Navigation Of Cruising AUV Based On Bearing Estimation

Yoshitaka Watanabe¹; Hiroshi Ochi¹; Takuya Shimura¹; Takehito Hattori²

¹*Japan Agency for Marine-Earth Science and Technology*

²*Nippon Marine Enterprises, Japan*

A Calibration Of SSBL Acoustic Positioning System In The Ocean

Takehito Hattori¹; Yoshitaka Watanabe²; Hiroshi Ochi²; Takuya Shimura²

¹*Tokyo University of Marine Science and Technology / Nippon Marine Enterprises, Ltd., Japan*

²*Japan Agency for Marine-Earth Science and Technology*

Accurate And Rapid Localization Of An AUV In An Absolute Reference Frame Using The Iterative Resection

Fanlin Yang¹; Xiushan Lu¹; Yamin Dang²; Zhimin Liu¹

¹*Shandong University of Science and Technology, China*

²*Chinese Academy of Surveying and Mapping*

Sessions/Papers by Day/Time

Autonomous surface vehicles

Thursday, 10:45 AM - 12:30 PM

C0-Chairs:

Nuno Cruz, *Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal*

Chau-Chang Wang, *Institute of Applied Marine Physics and Undersea Technology, National Sun Yat-sen University, Taiwan*

Control Of Mini Autonomous Surface Vessel

Zulkifli Abidin; Mohd Rizal Arshad; Umi Kalthum Ngah; Ong Ping
Underwater Robotics Research Group (URRG), School of Electrical and Electronic Engineering, Universiti Sains Malaysia

Perimeter Patrol On Autonomous Surface Vehicles Using Marine Radar

Elena Oleynikova; Nicole Lee; Andrew Barry; Joseph Holler; David Barrett
Franklin W. Olin College of Engineering, USA

A Model Estimation And Multi-Variable Control Of An Unmanned Surface Vehicle With Two Fixed Thrusters

Jeong-Hong Park; Hyung-Won Shim; Bong-Huan Jun; Sea-Moon Kim; Pan-Mook Lee; Yong-Kon Lim
Korea Ocean Research & Development Institute

Nonlinear Modeling, Simulating And Experiment Of An Autonomous Surface Vehicle Driven By Twin Electric Thrusters

Jianhua Wang; Wei Gu; Jianxin Chu; Xixia Huang
Shanghai Jiao Tong University, China

Stereovision Aided Navigation Of An Autonomous Surface Vehicle

Jianhua Wang; Wei Gu; Jianxin Chu; Wangqian Niu
Shanghai Jiao Tong University, China

Sessions/Papers by Day/Time

Anti-submarine warfare

Thursday, 10:45 AM - 12:30 PM

C0-Chairs:

David Liebing, *DSTO*

Cooperative ASW At NURC - Moving Towards A Net-Centric Capability

Robert Been; David Hughes; John Potter; Chris Strobe
NATO Undersea Research Centre

Sensible Behaviour Strategies For AUVs In ASW Scenarios

David Hughes; Stephanie Kemna; Mike Hamilton; Robert Been
NATO Undersea Research Centre

Improving Anti-Submarine Warfare Sonar Performance Modelling Using Range-Dependent BLUElink Forecast Environmental Data

Jarrad Exelby; Han Vu
Defence Science & Technology Organisation, Australia

Performance Assessment Of Sonar-System Networks For Anti-Submarine Warfare

Jane Thredgold; Matthew Fewell; Simon Lourey; Han Vu
Defence Science & Technology Organisation, Australia

Active Sonar Target Tracking For Anti-Submarine Warfare Applications

Jimmy Wang; Alice von Trojan; Simon Lourey
Defence Science & Technology Organisation, Australia

Sessions/Papers by Day/Time

Marine geology and geophysics

Thursday, 10:45 AM - 12:30 PM

CO-Chairs:

Nicholas Chotiros, *Applied Research Laboratories, University of Texas, USA*

Blair Thornton, *University of Tokyo, Japan*

The Development Of An Acoustic Probe To Measure The Thickness Of Ferro-Manganese Crusts

Blair Thornton¹; Tamaki Ura¹; Akira Asada¹; Katsumi Ohira²; Daigo Kirimura³

¹*University of Tokyo, Japan*

²*Japan Probe Co. Ltd.*

³*Link Laboratory Inc., Japan*

The Aquares Resistivity System, As An Exploration Tool For Rock Dredging Applications

Peteralv Brabers¹; Jason Errey²

¹*Demco NV, Belgium*

²*Demco NV, Australia*

Geomorphology And Tectonic Interpretation Of Zhujiang Submarine Canyon, In The Northern South China Sea

Xibin Han¹; Jiabiao Li²; Fengyou Chu²; Jun Li²; Fanlin Yang³

¹*Second Institute of Oceanography, State Oceanic Administration, China*

²*Key Laboratory of Submarine Geosciences of SOA, China*

³*Shandong University of Science and Technology, China*

Ocean Three Components Magnetometer For Seafloor Observatory

Xueting Zhang¹; Ying Chen¹; Chunyan Guan²

¹*Zhejiang Univerisity, China*

²*Hangzhou Dianzi University, China*

Seismic Imaging Of Oceanic Crust Across The Northwestern Subbasin, South China Sea

Zhenli Wu; Jiabiao Li; Aiguo Ruan

Second Institute of Oceanography, State Oceanic Administration, China

Sessions/Papers by Day/Time

SAR / ocean color and hyperspectral measurements

Thursday, 1:30 PM - 3:15 PM

C0-Chairs:

Roy Hughes, *DSTO*

Global Change And Remote Sensing Of CDOM In Arctic Coastal Waters

Tiit Kutser

Estonian Marine Institute, University of Tartu

Detection Of Coastal Bathymetry Using Hyperspectral Imagery

Enjie Jing¹; Bisun Datt²

¹*Defence Science & Technology Organisation, Australia*

²*HyVista Corporation, Australia*

Multi-Resolution Eddy Detection From Ocean Color And Sea Surface Temperature Images

Imen Karoui¹; HERVE CHAURIS²; PIERRE GARREAU¹; Phillipe Craneguy³

¹*French Research Institute for Exploitation of the Sea*

²*Centre de Géosciences, MINES-ParisTech, France*

³*Actimar, France*

Comparison Of Ship Detectors For Polarimetric SAR Imagery

David Crisp; Thomas Keevers

Defence Science & Technology Organisation, Australia

InSAR Kalman Filter Phase Unwrapping Algorithm Based On Topographic Factors

Guolin Liu¹; Huadong Hao¹; Yamin Dang²; Fanlin Yang¹; Man Yan¹; Zhixing Du¹

¹*Shandong University of Science and Technology, China*

²*Chinese Academy of Surveying and Mapping*

Sessions/Papers by Day/Time

Underwater communications 6

Thursday, 1:30 PM - 3:15 PM

CO-Chairs:

Mandar Chitre, *Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Yahong Zheng, *Missouri University of Science and Technology, USA*

Data Driven Algorithms To Tune Physical Layer Parameters Of An Underwater Communication Link

Satish Shankar¹; Mandar Chitre¹; Melani Jayasuriya²

¹*Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

²*Department of Electrical and Computer Engineering, National University of Singapore*

The Performance Analysis Of Diversity Technologies For Underwater Moving Channel Environments Using Experimental Data

Hak-Lim Ko¹; Min-Sang Kim¹; Seung-goo Lee¹; Jae-Hoon Jung¹; Jong-Won Park²; Yong-Kon Lim²

¹*Hoseo University, Korea*

²*Maritime & Ocean Engineering Research Institute, Korea*

Capacity Analysis Of Underwater Acoustic MIMO Communications

Pierre-Jean Bouvet; Alain Loussert

Underwater Acoustics Lab, Institut Supérieur de l'Electronique et du Numerique Brest, France

Turbo Detection For Mobile MIMO Underwater Acoustic Communications

Jun Tao¹; Yahong Zheng²; Chengshan Xiao²

¹*University of Missouri - Columbia, USA*

²*Missouri University of Science and Technology, USA*

Bandwidth-Efficient Frequency-Domain Equalization For MIMO Underwater Acoustic Communications

Jian Zhang; Yahong Zheng

Missouri University of Science and Technology, USA

Sessions/Papers by Day/Time

Advances in integrated marine observing systems 3

Thursday, 1:30 PM - 3:15 PM

C0-Chairs:

Simon Allen, *University of Tasmania*

Automated Assessment Of Data Quality In Marine Sensor Networks

Greg Timms¹; Paulo de Souza¹; Leon Reznik²

¹*Tasmanian Information & Communication Technologies Centre, Australia*

²*Department of Computer Sciences, Rochester Institute of Technology, USA*

Autonomous Adaptive Environmental Assessment And Feature Tracking Via Autonomous Underwater Vehicles

Stephanie Petillo; Arjuna Balasuriya; Henrik Schmidt

Massachusetts Institute of Technology, USA

Autonomous Profiling Glider Observations In Storm Bay

Farhan Rizwi; Lindsay MacDonald; Karen Wild-Allen; Emlyn Jones

Marine and Atmospheric Research, CSIRO, Australia

The Integrated Marine Observing System: Delivering Data-Streams To Support Marine Research And Applications.

Roger Proctor; Tim Moltmann; Katy Hill; Marian McGowen

Integrated Marine Observing System, University of Tasmania, Australia

A Framework For Marine Sensor Network & Autonomous Vehicle Interaction

Matthew Dunbabin¹; Peter Corke²

¹*CSIRO Information & Communication Technologies, Australia*

²*Queensland University of Technology, Australia*

Sessions/Papers by Day/Time

Vehicle design 2

Thursday, 1:30 PM - 3:15 PM

CO-Chairs:

Hayato Kondo, *Tokyo University of Marine Science and Technology, Japan*

Ji-Hong Li, *Pohang Institute of Intelligent Robotics, Korea*

Development Of An Intelligent Autonomous Underwater Vehicle, P-SURO

Ji-Hong Li; Byung-Ho Yoon; Seung-Sub Oh; Jung-San Cho; Jong-Geol Kim; Mun-Jik Lee; Jung-Woo Lee

Pohang Institute of Intelligent Robotics, Korea

Biomimetic Mechanical Design For Soft-Bodied Underwater Vehicles

Maria Fiazza¹; Taavi Salumäe²; Guntis Kulikovskis³; Robert Templeton⁴; Otar Akanyeti¹; William McGill⁴; Paolo Fiorini¹; Maarja Kruusmaa²; Madis Listak⁵

¹*University of Verona, Italy*

²*Center for Biorobotics, Tallinn University of Technology, Estonia*

³*Department of Theoretical Mechanics, Riga Technical University, Latvia*

⁴*University of Bath, UK*

⁵*Tallinn University of Technology, Estonia*

Terramechanics Based Traction Control Of Underwater Wheeled Robot

Tjasa Boh¹; John Billingsley¹; Robin Bradbeer²; Paul Hodgson²

¹*University of Southern Queensland, Australia*

²*City University, Hong Kong*

On Fault-Tolerant Control Of A Hovering AUV With Four Horizontal And Two Vertical Thrusters

Jin-Kyu Choi; Hayato Kondo

Tokyo University of Marine Science and Technology, Japan

Design And Concept Of A Biointeractive Autonomous Underwater Vehicle "BA-1"

Hayato Kondo¹; Kenji Nakane²; Etsuro Shimizu¹; Jin-Kyu Choi¹; Kenji Nagahashi²; Masakazu Matsushima²; Yasunori Nishida²; Takafumi Arimoto¹; Yoshinori Miyamoto¹; Kazuo Amakasu¹; Makoto Endo¹; Ryosuke Matsui²

¹*Tokyo University of Marine Science and Technology, Japan*

²*Mitsui Engineering & Shipbuilding Co., Ltd., Japan*

Sessions/Papers by Day/Time

Array signal processing and array design 2

Thursday, 1:30 PM - 3:15 PM

C0-Chairs:

Michael Clark, *Thales Australia*

Calibration Uncertainty Of Assembled Array Hydrophones

Yujin Gao; Peter Harvey; Patrick Cooper; Paul Bake
Thales, Australia

Fiber Laser Sensor Hydrophone Performance

Ian Bedwell; Dave Jones
Thales, Australia

Improved Noise Performance Of A DFB Fibre Laser Sonar Array Using A Frequency Reference

Andrew Michie¹; David Jones²; David Wang¹; David Mann²; Mattias Aslund¹; Simon Fleming¹; John Canning¹
¹*University of Sydney, Australia*
²*Thales, Australia*

Antenna Design And Performance Assessment For Fast High Resolution Sonar Imaging Using High Bandwidth Transducers And Frequency Domain Compounding

Franzjosef Becker; Christian Degel; Heinrich Fonfara; Holger Hewener; Hansjoachim Welsch; Steffen Tretbar; Marc Fournelle; Robert Lemor
Fraunhofer Institute for Biomedical Technology, Germany

Spatio-Temporal Signal Twice-Whitening Algorithms On The hx3100 Ultra-Low Power Multicore Processor

Travis Humble¹; Pramita Mitra²; Bryan Schleck³; Jacob Barhen¹; John Polcari⁴; Michael Traweck⁵
¹*Oak Ridge National Laboratory, USA*
²*University of Notre Dame, USA*
³*Coherent Logix, USA*
⁴*Science Applications International Corporation, USA*
⁵*Office of Naval Research, USA*

Sessions/Papers by Day/Time

Maritime security and harbour protection

Thursday, 1:30 PM - 3:15 PM

C0-Chairs:

Alan Theobald, *DSTO*

Using Collaborative Autonomous Vehicles In Mine Countermeasures

Vladimir Djapic¹; Dula Nad²

¹*NATO Undersea Research Centre*

²*University of Zagreb, Croatia*

Autonomy For Operational MCM AUVs, Based On High Resolution Sonar

Nicolas Mandelert¹; Julien Ferrand¹; Patrick Cooper²

¹*Thales Underwater Systems, France*

²*Thales, Australia*

Cooperative Autonomy For Contact Investigation

Toby Schneider¹; Henrik Schmidt¹; Thomas Pastore²; Michael Benjamin³

¹*Massachusetts Institute of Technology, USA*

²*NATO Undersea Research Centre*

³*Naval Undersea Warfare Centre, USA*

Towards The Use Of A Team Of USVs For Civilian Harbour Protection: The Problem Of Intercepting Detected Menaces

Alessio Turetta¹; Giuseppe Casalino¹; Enrico Simetti¹; Matteo Cresta²

¹*Department of Communication Computer and System Sciences, University of Genova, Italy*

²*Selex Sistemi Integrati, Italy*

Operational Experiences For Maritime Homeland Security Operations

Alastair Cormack; David Lane; Jon Wood

SeeByte Ltd, UK

Sessions/Papers by Day/Time

Sustainable energy in East Asia

Thursday, 1:30 PM - 3:15 PM

C0-Chairs:

Beom-Soo Hyun, *Korea Maritime University*

Toru Sato, *University of Tokyo, Japan*

Current Status And Future Prospects Of Electric Generators Using Electroactive Polymer Artificial Muscle

Seiki Chiba¹; Mikio Waki²; Koichi Masuda³; Tomoki Ikoma³

¹*SRI International, USA*

²*Hyperdrive Corporation, Japan*

³*Nihon University, Japan*

A Wave Focusing Device For OWC Wave Energy Converter

Beom-Soo Hyun¹; Zhen Liu²; JiYuan Jin¹; Yong Hyeon Choi¹; Hongda Shi²; Qin Zhang²

¹*Korea Maritime University*

²*Ocean University of China*

A Pilot Project On Ocean Energy Generation By Tidal Currents On The Northern Coast Of Taiwan

Cheng-Han Tsai¹; Dong-Jiing Doong¹; Young-Zehr Kehr¹; Hsien-Wen Li²; Chung-Ru Ho¹; Nan-Jung Kuo¹; Shih-Jen Huang¹; Yao-Tsai Lo¹; Hung-Jen Lee¹

¹*National Taiwan Ocean University*

²*Minghsin University of Science and Technology, Taiwan*

A Study On An Experiment Of Behavior Of A Spar Type Offshore Wind Turbine Considering Rotation Of Wind Turbine Blades

Motohiko Murai; Ryuji Nishimura

Yokohama National University, Japan

Mitigation Of Environmental Impact Of Power-Plant Discharge By Use Of Ocean Thermal Energy Conversion System

Hyeon-Ju Kim; Ho-Saeng Lee; Seung-Won Lee; Dong-Ho Jung; Deok-Soo Moon

Korea Ocean Research & Development Institute

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Underwater communications 7

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CO-Chairs:

Saman Abeysekera, *Nanyang Technological University, Singapore*

Pierre-Jean Bouvet, *Underwater Acoustics Lab, Institut Supérieur de l'Electronique et du Numerique Brest, France*

Frequency-Domain Channel Estimation For Nonlinear Multicarrier Underwater Communication Systems

Ching-Hsiang Tseng; Chin-Feng Lin; Fu-Sheng Lu; Hsien-Sen Hung; Tzong-Dar Wu; Hoang-Yang Lu; Shun-Hsyung Chang

Department of Electrical Engineering, National Taiwan Ocean University

Dynamic Compact Control Language: A Compact Marshalling Scheme For Acoustic Communications

Toby Schneider; Henrik Schmidt

Massachusetts Institute of Technology, USA

Virtual Unequal Error Protection In Underwater Image Transmission

Laura Toni¹; Lorenzo Rossi¹; Nazim Agoulmine²; Jean Guy Fontaine¹

¹*Italian Institute of Technology*

²*LRSM, University of Evry, Val d'Essonne, France*

Robust Discrete Fourier Transform Based Receivers For Continuous Phase Modulation

Saman Abeysekera; Wen Wang

Nanyang Technological University, Singapore

Sessions/Papers by Day/Time

Buoy technology

Thursday, 3:45 PM - 5:30 PM

CO-Chairs:

Lindsay Pender, *CSIRO Marine & Atmospheric Research, Australia*

David Hughes, *CSIRO Marine & Atmospheric Research, Australia*

A Robust Satellite Telemetry System For IMOS Moorings

David Hughes; Tim Lynch; Lindsay Pender; Matthew Sherlock

CSIRO Marine & Atmospheric Research, Australia

An Anchor Mooring Profile Monitoring Buoy Based On Underwater Non-Contact Wireless Communication

Jing Liu¹; Guang Zhang¹; Hai Yu²; Xue Zhang²

¹*Wuhan University of Technology, China*

²*School of Electronics & Information, Hangzhou Dianzi University, China*

Design And Application Of Buoy System For On-The-Fly Observation Of Surface Current In Closure Water Area

Yuliang Gu¹; Fengnian Zhou²; Baohua Xu²; Jianhu Zhao³

¹*Qingcao Sha Investment and Construction Corporation Ltd., China*

²*Survey Bureau of Hydrology and Water Resources of Changjiang Estuary, China*

³*School of Geodesy and Geomatics, Wuhan University, China*

Pulse - A Mooring For Mixed Layer Measurements In The Open Ocean And Extreme Weather

Lindsay Pender; Tom Trull; Danny McLauglan; Tim Lynch

CSIRO Marine & Atmospheric Research, Australia

CDS-Based Coverage Control Algorithm For Buoys Based Sensor Networks

Wenyu Cai¹; Jing-Biao Liu¹; Xue-Ting Zhang²

¹*Hangzhou Dianzi University, China*

²*Zhejiang University, China*

Sessions/Papers by Day/Time

Collaborative autonomous vehicles 2

Thursday, 3:45 PM - 5:30 PM

C0-Chairs:

Vladimir Djapic, *NATO Undersea Research Centre*

Ryan Smith, *University of Southern California, USA*

Cooperative Multi-AUV Tracking Of Phytoplankton Blooms Based On Ocean Model Predictions

Ryan Smith¹; Jnaneshwar Das¹; Yi Chao²; David Caron¹; Burton Jones¹; Gaurav Sukhatme¹

¹*University of Southern California, USA*

²*Jet Propulsion Laboratory, California Institute of Technology, USA*

Chemical Plume Source Localization With Multiple Autonomous Underwater Vehicles

Bernardo Maciel; João Sousa; Fernando Pereira

Underwater Systems and Technologies Laboratory, Faculty of Engineering, University of Porto, Portugal

Measurement Of Magnetic Field Using Collaborative AUVs

Jesse Pentzer¹; Brendan Crosbie¹; Jim Frenzel²; John Canning²; Thomas Bean²; Michael Anderson³; Dean Edwards²

¹*University of Idaho, USA*

²*Center for Intelligent Systems Research, University of Idaho, USA*

³*Department of Mechanical Engineering, University of Idaho, USA*

Cooperative Autonomous Underwater Vehicle Localization

Marcelo Nogueira; João Sousa; Fernando Manuel Pereira

Faculdade de Engenharia da Universidade do Porto, Portugal

RT2: A Real-Time Ray-Tracing Method For Acoustic Distance Evaluations Among Cooperating AUVs

Giuseppe Casalino¹; Andrea Caiti²; Alessio Turetta¹; Enrico Simetti¹

¹*Department of Communication Computer and System Sciences, University of Genova, Italy*

²*Department of Electrical Systems and Automation, University of Pisa, Italy*

Sessions/Papers by Day/Time

Data visualization and information management

Thursday, 3:45 PM - 5:30 PM

C0-Chairs:

Kate Beard, *University of Maine, USA*

Scott Bainbridge, *Australian Institute of Marine Science*

The Design Of A Novel Time Series Client For Ocean Data.

Scott Bainbridge

Australian Institute of Marine Science

Development Of The Red Sea Biogeographic Information System

Fahmi Machda; Norú Ichim-Moreno; Chandra Prasetyo; Christian Voolstra

King Abdullah University of Science and Technology, Saudi Arabia

Extracting Valuable Information From A Simultaneous Visualization Of Science And Engineering Data Obtained With An Autonomous Underwater Vehicle

Robert Robinson¹; Paulo de Souza²; Andrew Davie²

¹*School of Computing and Information Systems, University of Tasmania, Australia*

²*Tasmanian Information & Communication Technologies Centre, Australia*

The EventViewer: A Tool For Visualizing And Exploring Events Extracted From Ocean Observing System Data

Kate Beard¹; Heather Deese²; Neal Pettigrew¹; Jake Emerson¹

¹*University of Maine, USA*

²*Island Institute, USA*

Sessions/Papers by Day/Time

Sonar and transducers / oceanographic sensors

Thursday, 3:45 PM - 5:30 PM

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Kenichi Asakawa, *Japan Agency for Marine-Earth Science and Technology*

Paul Macoun, *VENUS Facility, University of Victoria, Canada*

Long-Term Stability Of A New Conductivity-Temperature Sensor Tested On The VENUS Cabled Observatory

Tomohiro Horiuchi¹; Fabian Wolk¹; Paul Macoun²

¹*Rockland Oceanographic Services Inc., Canada*

²*VENUS Facility, University of Victoria, Canada*

A Pressure-Neutral Acoustic Transmit Receive Module (PR-TRM) With Integrated Data Processing For Deep Sea Applications

Matthias Molitor; Manfred Moses; Marc Schmieger; Olaf Walter; Peter Weber; Robert Lemor

Fraunhofer Institute for Biomedical Technology, Germany

Modeling And Theoretical Characterization Of Circular pMUT For Immersion Applications

Mohd Ikhwan Hadi Yaacob; Mohd Rizal Arshad; Asrulnizam Abd Manaf

Universiti Sains Malaysia

Standard Target Calibration Of Broad-Band Active Sonar Systems In A Laboratory Tank

Alan Islas-Cital; Philip Atkins; Kae Foo

University of Birmingham, UK

Evaluation Of Small Models Of Ceramic Housings For 11,000m Ocean Bottom Seismometers

Kenichi Asakawa¹; Makoto Ito²; Tadahiro Hyakudome¹

¹*Japan Agency for Marine-Earth Science and Technology*

²*Nippon Marine Enterprises, Ltd., Japan*

Sessions/Papers by Day/Time

Marine environmental engineering in East Asia

Thursday, 3:45 PM - 5:30 PM

C0-Chairs:

Dong-Jiing Doong, *Department of Marine Environmental Informatics, National Taiwan Ocean University*

Yusaku Kyojuka, *Kyushu University, Japan*

A Feasibility Study On The Water Quality Improvement By Making Use Of Underground Water In Hakata Bay

Yusaku Kyojuka¹; Yasufumi Uchida¹; Ayano Kudoh¹; Shigeyasu Kawaguchi²

¹*Kyushu University, Japan*

²*Hakata-wan Kankyou Seibi Co., Ltd, Japan*

Assessment Of Environmental Restoration Plans For A Small-Scale Beach By Simulation-Based Habitat Evaluation

Shigeru Tabeta; Rikito Hisamatsu

University of Tokyo, Japan

Impact Of River Discharge On Surface Water Variability In Amagasaki Port, Japan

Ryoichi Yamanaka¹; Yasunori Kozuki¹; Machi Miyoshi²; Fumiko Nogami¹

¹*University of Tokushima, Japan*

²*Tokushima Bunri University, Japan*

Treatment Of Waste Seawater By Electrolysis Using Charcoal Electrodes

Daisuke Kitazawa¹; Masatoshi Fujino¹; Shunsuke Aoba²

¹*Institute of Industrial Science, University of Tokyo, Japan*

²*Graduate School of Engineering, The University of Tokyo, Japan*

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BAUMEISTER, Henry

- The Lucinda Jetty Coastal Observatory's Role In Satellite Ocean Colour Calibration And Validation For Great Barrier Reef Coastal Waters.

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- Advances In The Gulf Of Maine Ocean Observing System: Technical Capabilities And Scientific Results

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24-27 May 2010
Program Book



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		Bayside 101	Bayside 102	Bayside 103	Bayside 104	Bayside 105	Bayside 106	Bayside 107	Bayside Grand Hall
M O N D A Y	0830	Tutorial T01	Tutorial T03	Tutorial T05	Tutorial T07				
	1300	Tutorial T02	Tutorial T04	Tutorial T06	Tutorial T08				
	1700	Ice Breaker Reception, Bayside Gallery							
T U E S D A Y	0830	Welcoming Ceremony & Plenary Talks:Bayside Auditorium A							
	1030	Morning tea							E X H I B I T I O N
	1100	Exhibition Opening							
	1200	Lunch							
	1300	EM & opto-acoust sensing	Underwater comms 1	IMOS 1	AUV 1	Array signal processing 1	Sound propgn & scattering	Student posters 1	
	1415	Afternoon tea							
	1515	HF radars	Underwater comms 2	Exploration/ recovery oil & gas	Vehicle navigation 1	AUV 2	Imaging & vision	Student posters 2	
	1700	Exhibition Reception							
W E D N E S D A Y	0830	Current measurement	Sonar signal processing 1	Marine management	AUV 3	Numerical modeling & simulation	Systems & observatories 1	Student posters 3	
	1015	Morning tea							
	1045	Oceanography 1	Underwater comms 3	Underwater imaging & mapping	Vehicle navigation 2	ROV	Classification & pattern recognition		
	1230	Lunch							
	1330	Hydrography Seafloor map Geodesy	Sonar signal processing 2	IMOS 2	Vehicle design 1	Signal coherence & fluctuation	Marine optics	Ocean energy & offshore structures	
	1515	Afternoon tea							
	1545	Oceanography 2	Underwater comms 4	Bioacoustics	Collaborative autonomous vehicles 1	Automatic control	Sonar imaging	Marine safety	
	1815	Assemble at Convention Jetty for boat departure							
1900	Conference Gala Function, Luna Park								
T H U R S D A Y	0830	Naval architecture	Sonar signal processing 3	Marine enviro W Pacific 1	AUV 4	Data assimilation & info mgt	Systems & observatories 2	Marine radars & comms	
	1015	Morning tea							
	1045	Model based signal proc	Underwater comms 5	Marine enviro W Pacific 2	Vehicle navigation 3	Autonomous surface vehicles	Anti-submarine warfare	Marine geology & geophysics	
	1230	Lunch							
	1330	SAR / ocean color hypersp	Underwater comms 6	IMOS 3	Vehicle design 2	Array signal processing 2	Maritime secur & harbor protection	Sustainable energy E Asia	
	1515	Afternoon tea							
	1545		Underwater comms 7	Buoy technology	Collaborative autonomous vehicles 2	Data visualization & info mgt	Sonar & transducers/ ocean sensors	Marine enviro engineering E Asia	



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EDITORIAL SCHEDULE

JULY/AUGUST 2010

Seabed Mapping & Sub-bottom Profiling

Editorial closing date May 14;

Advertising closing date May 28

SEPTEMBER/OCTOBER

Ocean Data Processing & Interpretation

• Oceans 2010, Seattle, WA, USA

Editorial closing date July 16;

Advertising closing date July 30

NOVEMBER/DECEMBER

Surface & Subsea Navigation and Precise Positioning; Maritime Security; Imaging Systems

• MAST, Rome, Italy

Editorial closing date September 15;

**Advertising closing date
September 30**

JANUARY/FEBRUARY 2011

ROVs/AUVs/Towed Bodies

• Underwater Intervention, New Orleans,
LA, USA

Editorial closing date November 15;

**Advertising closing date
November 30**

MARCH/APRIL 2011

Oceanographic Instrumentation; Environmental Monitoring

• Ocean Business, Southampton, UK

Editorial closing date January 17;

Advertising closing date January 31

MAY/JUNE 2011

Connectors/Cables/Winches; Offshore Renewables/ Offshore Technology

• OTC, Houston, TX, USA

• UDT Europe, Cannes, France

• Seawork, Southampton, UK

Editorial closing date March 15;

Advertising closing date March 31

• Editorial preview and bonus distribution at exhibition

INTERNATIONAL
Ocean Systems

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Welcome Message



On behalf of the Local Organising Committee for the OCEANS '10 IEEE Sydney Conference and Exhibition, I warmly welcome you to OCEANS Down Under. This international event is being staged at a magnificent venue in a unique city that is graced by the world's finest natural harbour and the splendour of its ocean beaches. This OCEANS conference and exhibition has been planned to provide each of you with an unforgettable human experience underpinned by Aussie humour, hospitality and friendliness.

Australia is a small nation inhabiting a continent that is an island. Its people are coastal dwellers, seafarers and ocean sports enthusiasts. Australia's ocean jurisdiction is vast in its expanse. The natural resources that abound in our waters and under the seabed enrich this lucky country. Australian marine scientists and engineers apply insight and ingenuity to understanding, observing, and protecting the ocean environment on which we are so dependent.

OCEANS '10 IEEE Sydney is an opportunity to showcase internationally Australia's capabilities in marine science and ocean engineering. It's a forum that brings together representatives from universities, industry and government organisations with policy makers, stakeholders and clients. The technical program and tutorials enable us to learn from international experts, to expand our professional network and to update us on the latest advances in marine science and engineering. The exhibition enables us to see and feel the latest sensors, systems, structures, information processing and display tools that are used to probe, measure, monitor and manage the world's oceans. Also, OCEANS is an opportunity to promote marine science and ocean engineering as professional pursuits worthy of engagement by young Australians.

Venture down under for an unforgettable OCEANS experience!

Dr Brian Ferguson
Conference General Chair



Keynote Speakers



MEETING SOCIAL CHALLENGES USING MARINE TECHNOLOGY

Craig McLean

*National Oceanic and Atmospheric
Administration, USA*

Craig McLean is the deputy for NOAA's Oceanic and Atmospheric Research programs and administration. He is responsible for daily operations and administration of NOAA's research enterprise, and the execution of NOAA programs including the Climate program, the National Sea Grant College program, and, Ocean Exploration and Research.

He has previously served in NOAA as Executive Officer of the National Ocean Service, and was the founding Director of NOAA's Office of Ocean Exploration. McLean served in uniform for nearly 25 years, retiring from NOAA's Commissioned Corps in the grade of Captain after service at sea, underwater, and in operational, legal, and marine resource management positions. McLean served aboard hydrographic, oceanographic, and fisheries research ships and was the first commanding officer of NOAA's largest fisheries research vessel, the 224-foot Gordon Gunter. He was instrumental in the development of the Smithsonian Institution's Ocean Hall, and in obtaining a dedicated ship for the national ocean exploration program, the NOAA Ship Okeanos Explorer.

A life long diver, he began exploring deep shipwrecks through decompression diving while in junior high school. These experiences have taken him to the Amazon River searching for freshwater dolphins, and to the RMS Titanic searching for solutions in international shipwreck management.

Craig McLean is also an attorney and has practiced marine resource law for NOAA. He has been awarded the Departmental Silver and Bronze Medals, the NOAA Corps Commendation Medal, and Special Achievement Medal. He is a Fellow of the Explorers Club, and of the Marine Technology Society, and a Past-President and Chairman of the Sea-Space Symposium.



UNDERSTANDING THE OCEANS – A NAVY PERSPECTIVE

Commodore Bruce Kafer
AM,[†] CSC,[‡] Royal Australian Navy

[†]Member of the Order of Australia

[‡]Conspicuous Service Cross

Commodore Bruce Kafer joined the Royal Australian Navy as a Cadet Midshipman in 1977. In 1982 he specialised in hydrographic surveying and, on completion of his basic survey course, served in hydrographic survey ships of the RAN and Royal Navy.

The highlights of Commodore Kafer's seagoing career have been command of the RAN ships HMAS FLINDERS and HMAS LEEUWIN. He has also had a variety of senior staff appointments ashore, most recently as the Chief, Combat Support Group in Fleet Headquarters. He also served for four years as Hydrographer and Commander of the RAN's Hydrographic, Meteorological and Oceanographic Force Element Group.

For seven months in 2008-09 Commodore Kafer held command of Combined Task Force 158, then Combined Task Force 152, coalition maritime task forces responsible for security in the Persian Gulf. In late 2009 he assumed duties as the Commandant, Australian Defence Force Academy.



WHY OCEAN SCIENCE MATTERS FOR AUSTRALIA

Dr Neville Smith
*Bureau of Meteorology, Melbourne,
Australia*

Dr Neville Smith is the Deputy Director (Research and Systems) at the Bureau of Meteorology. Dr Smith was previously Chief Scientist and head of the Bureau of Meteorology Research Centre, prior to the creation of the Centre for Australian Weather and Climate Research. As a scientist, Dr Smith played a key role in the development of ocean and climate prediction systems and has worked with the international community in the development of observing systems for climate. Dr Smith is currently the National Delegate to the Intergovernmental Oceanographic Commission and a member of the IPCC Bureau.



General Information

Accommodation

Ibis Darling Harbour	Tel. +61 2 9563 0888 Fax +61 2 9288 7189
Novotel Darling Harbour	Tel. +61 2 9934 0000 Fax +61 2 9934 0099
Grand Mercure Apartments	Tel. +61 2 9563 6666 Fax +61 2 92887189
Oaks Goldsbrough Apartments	Tel. +61 2 9518 5166
Crowne Plaza Darling Harbour	Tel. +61 2 9261 1188 Fax +61 2 9261 8766

Business Centre

Public internet and computer access is available at the Bayside Business Lounge, Ground Floor, Convention Centre Bayside.

Delegate Entitlements

Tutorial Registration

- Conference tutorial sessions (Monday 24 May 2010)

Full Registration and Paper Registration

- All Conference sessions (Tuesday 25 to Thursday 27 May 2010)
- Ice Breaker Reception (Monday 24 May 2010)*
- Entry to the Conference Welcome (Tuesday 25 May 2010)
- Exhibitor Reception (Tuesday 25 May 2010)*
- Conference Gala Function (Wednesday 26 May 2010)*
- Morning and afternoon teas (Tuesday 25 to Thursday 27 May 2010) *
- Lunch (Tuesday 25 to Thursday 27 May 2010) *
- Entry to exhibition in the Bayside Grand Hall (Tuesday 25 to Thursday 27 May 2010)
- Conference satchel with conference proceedings on CD-ROM
- Conference material

Student Registration

- All Conference sessions (Tuesday 25 to Thursday 27 May 2010)
- Entrance to the Conference Welcome (Tuesday 25 May 2010)
- Morning and afternoon teas (Tuesday 25 to Thursday 27 May 2010) *
- Lunch will need to have been purchased ahead of time via online registration form (Tuesday 25 to Thursday 27 May 2010) *
- Entrance to exhibition in the Bayside Grand Hall (Tuesday 25 to Thursday 27 May 2010)
- Conference satchel with conference proceedings on CD-ROM
- Conference material



One Day Registration

- All Conference sessions on the selected day (Tuesday, Wednesday or Thursday)
- Entrance to the exhibition on the selected day
- Morning and afternoon teas on the selected day *
- Lunch will need to have been purchased ahead of time via online registration form
- Conference satchel with conference proceedings on CD-ROM
- Conference material

*Kosher and Halal meals needed to have been ordered in advance via the registration form. Special meals may incur additional fees. If you have ordered a special meal please speak to a member of the catering staff to have it brought to you at break times.

Exhibition

The exhibition is located in the Grand Hall, Ground Floor, Convention Centre Bayside. The exhibition opening hours are as follows:

Monday 24 May 2010	Exhibition Closed
Tuesday 25 May 2010	1030 – 1900
Wednesday 26 May 2010	0830 - 1730
Thursday 27 May 2010	0830 - 1600

Internet

Wireless internet connection is available for all delegates to use in the Exhibition Area, located in the Bayside Grand Hall, ground floor. See below for the login details:

Wireless Network Name: OCEANS10

User ID: sydney

Password: bluesea

Messages

For delegates' convenience, messages for other delegates may be left at the Registration Desk. The staff at the Registration Desk will contact the recipient to help ensure the message is received.

Mobile Phones

For the convenience of all delegates please ensure your mobile is turned to silent or off during sessions.

Unauthorised Audio/Video Recording of tutorial, plenary or technical sessions is not permitted.

Name Badges

For security purposes, delegates and exhibitors must wear their name badges at all times during the Conference. Entrance to the exhibition and the sessions will be limited to badge holders only. All fully registered delegates, paper registrations and accompanying persons name badges will allow entry to the Ice Breaker Reception (Monday), Conference Welcome (Tuesday),



Exhibitor Reception (Tuesday), Conference Gala Function (Wednesday) and the Exhibition (Tuesday to Thursday).

Parking

The Exhibition Centre car park is conveniently located off Darling Drive, underneath the Centre's five exhibition halls. The car park has direct access to the venue and the many attractions and facilities available in Darling Harbour.

Car park opening hours:

Monday to Thursday	0600 - 0100 the next day
Friday	Open from 0600 (24 hours)
Saturday	Open 24 hours
Sunday	Closes at 1am Monday morning

Rates:

Day Rates for all vehicles are:

0-1 hours	= \$8.00
1-2 hours	= \$16.00
2-3 hours	= \$22.00
3-4 hours	= \$26.00
4+ hours	= \$28.00

Evening Rates for all vehicles are:

0-1 hours	= \$7.00
1-2 hours	= \$13.00
2+ hours	= \$18.00

Evening Rates apply for entry after 5pm and exit before 9am the following day.

Automatic pay stations are located throughout the car park, with a central pay station in the area under Hall 5. Payment is made at these stations prior to exiting the car park. Prepayment is also available. Please note that the ceiling height of the Exhibition Centre car park is 1.8 metres. For any enquiries please telephone +61 2 9282 5000.

Registration Desk

The Registration Desk is located on the Ground Floor of the Convention Bayside at the entry to the Grand Hall (Exhibition Area). The Registration Desk will be open during the following times:

Monday 24 May 2010	0730 - 1730
Tuesday 25 May 2010	0730 - 1730
Wednesday 26 May 2010	0730 - 1800
Thursday 27 May 2010	0730 - 1800

Refreshments and Lunch

See below for the catering times and locations during the Conference. All onsite meals are included for fully registered delegates and paper registrations. Morning and afternoon teas are included for registered students however student lunch vouchers should be purchased ahead of time via the online registration form.



Date	Time	Event	Venue
MON 24 May	1000-1030	Morning Tea	Bayside Gallery, Level 1
	1200-1300	Lunch at own expense	Darling Harbour Precinct has a range of restaurants and cafes for delegates to select from.
	1430-1500	Afternoon Tea	Bayside Gallery, Level 1
	1700-1900	Ice Breaker Reception	Bayside Gallery, Level 1
TUE 25 May	1030-1100	Morning Tea	Bayside Grand Hall, Ground
	1200-1300	Lunch	Bayside Grand Hall, Ground
	1445-1515	Afternoon Tea	Bayside Grand Hall, Ground
	1700-1900	Exhibition Reception	Bayside Grand Hall, Ground
WED 26 May	1015-1045	Morning Tea	Bayside Grand Hall, Ground
	1230-1330	Lunch	Bayside Grand Hall, Ground
	1515-1545	Afternoon Tea	Bayside Grand Hall, Ground
	1800-2200	Conference Gala Function	Luna Park, Sydney
THU 27 May	1015-1045	Morning Tea	Bayside Grand Hall, Ground
	1230-1330	Lunch	Bayside Grand Hall, Ground
	1515-1545	Afternoon Tea	Bayside Grand Hall, Ground

Speaker Preparation

Speakers are asked to report to the Speaker Preparation Room in Bayside 108, Level 1 of the Convention Centre preferably the day before their presentation or if this is not possible, at least 3 hours prior to their session start time. Opening hours are as follows:

Monday 24 May 2010	0730 – 1730
Tuesday 25 May 2010	0730 – 1730
Wednesday 26 May 2010	0730 – 1730
Thursday 27 May 2010	0730 – 1400



Social Program

Ice Breaker Reception

Monday 24 May 2010

Venue: Bayside Gallery, Level 1 Sydney Convention and Exhibition Centre

Time: 1700 – 1900

Who may attend: Inclusive for Fully Registered Delegates and those who have paid for their attendance via the online registration form. Additional tickets may be purchased from the registration desk on Monday up until lunchtime for AUD\$99.00. Meet with your colleagues in the Bayside Gallery for networking opportunities as you relax and enjoy drinks and canapés.

Conference Welcome

Tuesday 25 May 2010

Time: 0830 – 0900

Venue: Bayside Auditorium A

Who may attend: Inclusive for all conference attendees.

Welcome Address:

Professor Mary O'Kane

NSW Chief Scientist and Scientific Engineer

Exhibition Reception

Tuesday 25 May 2010

Time: 1700 – 1900

Venue: Bayside Grand Hall, Ground Floor, Sydney Convention and Exhibition Centre

Who may attend: Inclusive for Fully Registered Delegates and Exhibitors and those who have paid for their attendance via the online registration form. Additional tickets may be purchased from the registration desk until Tuesday lunchtime for AUD\$77.00.

The Exhibition will be a major component of the Conference and the Exhibition Reception is the best opportunity to network with exhibitors and delegates alike. The Exhibition will feature cutting edge technology across the spectrum of Oceanic Sciences, Oceanography and Marine Engineering as supported by leaders in this industry. Be there at the Exhibition Reception as this zone develops as the networking hub of the Conference! You will enjoy drinks and canapés in a relaxed atmosphere.



Conference Gala Function



Wednesday 26 May 2010

Time: 1900 - 2300

Venue: Luna Park, Sydney

Who may attend: Inclusive for Fully Registered Delegates and those who have paid for their attendance via the online registration form. Additional tickets may be purchased from the registration desk until Wednesday lunchtime for AUD\$165.00.

Ferry Transfers will depart from Convention Wharf located directly in front of the Convention Centre Bayside. Meet at 1815 for the main departure at 1830. A smaller ferry will depart at 1845 for Luna Park.

Return Coaches will depart from Luna Park at The Face entrance. Delegates will be returned to the Convention Centre, the Ibis hotel Darling Harbour, the Novotel Darling Harbour, the Oaks Goldsbrough Hotel or Central Station.

1st return time: 2200

2nd return time: 2230

3rd return time: 2315

Sure to be the social highlight of the Conference Social Program, the Conference Gala Function will see delegates and guests cruising Sydney Harbour followed by a spectacular event where OCEANS '10 IEEE Sydney 2010 has secured exclusive rights to Luna Park for the entire evening! Superb entertainment, award winning cuisine and fine Australian wines will be combined with the stunning backdrop of the Sydney Opera House and the Harbour Bridge. This event is guaranteed to be a night of pure enjoyment and a fitting social climax of the OCEANS '10 Conference.

Awards Presentation

The OCEANS '10 Student Poster Awards will be presented at the Gala Function by COL Norm Miller, IEEE OES Student Activities Chair, and Dr Stefan Williams, Chair of the Student Program.



Conference Organisation & Secretariat

Sponsor: IEEE Oceanic Engineering Society

Honorary Co-Chairs:



Prof. Hugh Durrant-Whyte
Fellow, IEEE; ARC Federation
Fellow; Professor of Mechatronic
Engineering
University of Sydney, Australia



Prof. William Carey
Fellow, IEEE; Professor of
Aerospace & Mechanical
Engineering
Boston University, USA



Dr John Riley
Chief, Maritime Operations
Division
Defence Science & Technology
Organisation, Australia



Local Organising Committee:



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DSTO



Dr Phil Chapple
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Chair of Tutorials
University of Canterbury,
Christchurch, New Zealand



Dr Stefan Williams
Chair of Student Program
University of Sydney



Gary Speechley
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Paul Piperias
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Prof. Mal Heron
IEEE Oceanic Engineering Society
Liaison
James Cook University,
Townsville, Australia



Nancy Jensen
CSIRO Wealth from Oceans
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Ashleigh Ockerby
Event Coordinator



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Conference Services Coordinator



List of Reviewers

We thank our abstract reviewers for their outstanding work that has ensured the technical excellence of the program.

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Bruce Howe	Jeanne Young
Roy Hughes	Manell Zakharia
Marcia Isakson	Shengli Zhou



Tutorials: Abstracts and Biographies



T01: Shallow water acoustics

Prof. William Carey

Time: 0830 - 1230

Room: Bayside 101

This tutorial is intended for engineers and scientists concerned with the assessment of long range acoustic communication and sound transmission in deep and shallow water. The bottom is typically a sandy-sediment and has the dominant influence on the attenuation. The present tutorial surveys the basic science and experimental results that will enable one to make realistic interpretations and predictions. The session plan consists of a primer on the fundamentals of underwater acoustics, beginning with the wave equation, deep-water propagation, shallow water propagation, and the question of standards and a brief overview of ambient noise. The shallow water model of the Pekeris is discussed, progressing to a discussion of the modal solutions for realistic downward refracting sound velocity profiles, with a detailed examination of sample calculations for propagation in range-independent oceans. An assessment and review of representative effects of attenuation and a discussion of the importance of attenuation is presented. Current physical models of ocean sediments are reviewed, beginning with the original phenomenological model introduced by Biot in 1956. Later evidence justifying and extending this model, especially the rigorous theory of Burridge and Keller in 1981, is reviewed, and the applicable predictions of the theory, such as that the attenuation in the sediment varies as the square of the frequency at low frequencies. The fourth hour is concerned with the field measurements of sediment properties and of how these can be incorporated into propagation predictions.

Biography: William M. Carey is a Professor of Aerospace and Mechanical Engineering at Boston University, an Adjunct Professor of Applied Mathematics at the Rensselaer Polytechnic Institute and an Adjunct Scientist at the Woods Hole Oceanographic Institution. He was the Editor of the Journal of Oceanic Engineering is currently an Associate Editor for Underwater Acoustics, the Journal of the Acoustical Society of America. He has been a Physicist at several the Naval Laboratories and the ASW Program Manager at the Defense Advanced Project Agency. At the University of Chicago's Argonne National Laboratory, he was an Associate Scientist and Section Manager of acoustic surveillance. He has been a consultant to both industry and government in the areas of



non-destructive testing, nuclear science/ environmental measurements, and applied ocean acoustics.

Dr. Carey is a Fellow of the Acoustical Society of America, a Fellow of the IEEE Oceanic Engineering Society, a full member of Sigma Xi, a member of the Connecticut Academy of Science and Engineering, and also a member of the Cosmos Club. He is the recipient of the IEEE-OES Distinguished Technical Achievement Award, the IEEE-OES Distinguished Service Award and an IEEE Millennium Medal. He recently received Pioneer of Underwater Acoustics Silver Medal. He received the B.S. degree in Mechanical Engineering, the M.S. degree in Physics, and the Ph.D. degree in Nuclear Science from the Catholic University of America.



T02: High Frequency Surface Wave Radar

Dr Stuart Anderson

Time: 1300 – 1630

Room: Bayside 101

HF surface wave radars exploit the electromagnetic ground wave mode of propagation to illuminate the ocean surface at 'over-the-horizon' ranges, up to several hundred kilometres. In most cases they are deployed at coastal sites within ~ 100 metres of the shoreline. Echoes provide information on waves and currents, as well as the presence of ships and other discrete features.

Existing HFSWR systems are clustered into two main categories : (i) low power, reasonably compact remote sensing systems designed to monitor ocean currents and measure wave spectra, and (ii) high power military systems with greater sensitivity and extended range coverage, employed for detection and tracking of ships, smaller ocean-going vessels and low-flying aircraft which fall below the horizon of microwave 'line-of-sight' radar systems. In addition, mention should be made of ship-borne HFSWR systems, though these remain the subject of research and development rather than being fitted to operational platforms.

This tutorial sets out to describe the principle characteristics of HFSWR systems, both the low power remote sensing systems and the military surveillance radars. The main subsystems of such radars are described, emphasising the factors which impact on HFSWR design. The electromagnetics of ground wave propagation and scattering is treated in some depth. A fairly detailed account of the geometry and dynamics of the ocean surface is provided, since it is effectively this surface that constitutes the 'channel' connecting radar to target, as well as serving as the target of interest in the case of remote sensing. The issue of radar siting is treated in detail, as in practice this



often entails important compromises in radar design and capability. Advanced signal processing techniques are discussed and their efficacy demonstrated.

These precepts are then brought together to show how HFSWR can address a wide range of oceanographic remote sensing missions. A comprehensive overview of the oceanographic remote sensing capabilities of HFSWR is presented, balanced by a frank account of some of the limitations which have been encountered in real-world experience. Remote sensing products from a number of HFSWR systems around the world are used to illustrate the contributions that HFSWR can make to diverse fields of oceanography, from hydrodynamics to the signatures of climate change.

Biography: Stuart Anderson holds BSc (Hons) and PhD degrees from the University of Western Australia. Since 1972 Dr Anderson has worked in the Australian Defence Science and Technology Organisation, where he was responsible for developing the ocean surveillance and remote sensing capabilities of the Jindalee over-the-horizon skywave radar system and the Iluka HF surface wave radar system. He has worked as a visiting scientist in several countries, contributing to various national and international HF radar programs, as well as holding adjunct appointments at Curtin University of Technology (Professor of Applied Physics), the University of New South Wales (Professor of Mathematics), and the University of Rennes I, France, (Professor and Docteur honoris causa). He was the recipient of the 1992 Minister of Defence Award for Research Achievement, and is an elected Fellow of the Electromagnetics Academy. His active research interests include electromagnetic scattering, ionospheric physics, radio oceanography, physics-based signal processing, microwave radar polarimetry, passive coherent location, and the exploitation of HF radar systems for a wide variety of missions.



T03: Stochastic matched filters for sonar signals

Prof. Philippe Courmontagne

Time: 0830 – 1200

Room: Bayside 102

In several domains of signal processing, such as detection or de-noising, it may be interesting to provide a second-moment characterization of a noise-corrupted signal in terms of uncorrelated random variables. Doing so, the noisy data could be described by its expansion into a weighted sum of known vectors by uncorrelated random variables. Depending on the choice of the basis vectors, some random variables are carrying more signal of interest information than noise ones. This is the case, for example, when a signal disturbed by a white noise is expanded



using the Karhunen-Loève expansion. In these conditions, it is possible either to approximate the signal of interest by keeping only its associated random variables, or to detect a signal in a noisy environment with an analysis of the random variable power. The purpose of this tutorial is to present such an expansion, available for both the additive and multiplicative noise cases, and its application to detection and de-noising. This noisy random signal expansion is known as the stochastic matched filter, where the basis vectors are chosen so as to maximize the signal to noise ratio after processing.

This tutorial is divided into three parts:

- The first part concerns the theory itself: the stochastic matched filter theory will be described for 1-D discrete-time signals and its extension to 2-D discrete-space signals. Furthermore, a study will be realized on two different noise cases: the white noise case and the speckle noise case.
- In the second part, the stochastic matched filter will be described in a detection context and this method will be confronted with signals resulting from underwater acoustics. The results obtained are then compared with those resulting from the classical matched filter theory.
- In the last part, the stochastic matched filter will be presented in a de-noising context. The de-noising being performed by a limitation to order Q of the noisy data expansion, two criteria to determine Q will be introduced. Experimental results on real SAS data are given to evaluate the performances of such an approach.

This tutorial is intended for people or scientists connected with 1-D/2-D signal or array processing, and interested to have a fly-over about these effective methods.

Biography: Philippe Courmontagne was born in 1970. He received the Ph. D. degree in Physics at the University of Toulon (France) in 1997. In 1999, he became Professor in a French electronic engineering school: the Institut Supérieur de l'Électronique et du Numérique (ISEN Toulon, France), in the field of signal processing and image processing. He joined in 2001 the Provence Materials and Microelectronics Laboratory (L2MP UMR CNRS 6137), which is a unit of the French national research center (CNRS). In 2005, he obtained his Habilitation (HDR - Habilitation to Supervise Research) for his works in the field of noisy signal expansion. In 2007, he has been elected to the degree of IEEE Senior Member in recognition of professional standing for his works in the field of signal de-noising (SAR, SAS images), signal detection in noisy environment and signal transmission.



T04: Localisation and Mapping

Dr Stefan Williams

Time: 1300 – 1630

Room: Bayside 102

This tutorial will examine current developments in the area of localisation and mapping for underwater systems. In particular, we will review methods for Simultaneous Localisation and Mapping (SLAM) using both high resolution

optical and acoustic data collected by underwater vehicles. We will demonstrate how observations of the terrain from the vehicle's mapping sensors can be used as part of the navigation solution to correct for drift in the vehicle's position estimate. Techniques for three dimensional scene reconstruction, visualisation, novelty detection and classification will also be described. Results from recent AUV deployments will be used to be illustrate the process.

Biography: Stefan B. Williams is a Senior Lecturer in the University of Sydney's School of Aerospace, Mechanical and Mechatronic Engineering. He is a member of the Australian Centre for Field Robotics where he leads the Marine Robotics group. He is also the head of Australia's Integrated Marine Observing System AUV Facility. His research interests include Simultaneous Localisation and Mapping in unstructured underwater environments as well as algorithms for autonomous navigation and control. He received his PhD from the University of Sydney in 2002 and completed a Bachelor of Applied Science with first class honours in 1997 at the University of Waterloo, Canada.



T05: Overview of high resolution sonar

Dr Marc Pinto

Time: 0830 – 1200

Room: Bayside 103

The basic principles of aperture will be reviewed including near field operation and related concepts such as Fresnel distance, focusing and depth of field. Next, principles of aperture sampling,

i.e. array design, will be presented including undersampled arrays exhibiting grating lobes and their minimization with the two-way beampattern of the transmitter and receive element. Frequency dependence and wideband operation will be discussed as well as the impact of calibration errors and uncertainties in the sound velocity profile on sonar resolution. This will be illustrated by different high resolution sonar designs



for seafloor imaging such as dynamic focusing, dynamic aperture and synthetic aperture sonar.

The basic sonar equation will be used to illustrate some of the factors limiting the range of high resolution sonar systems. It is shown how the signal to noise ratio can be enhanced by the frequency modulation and state of the art front end electronics. More fundamental factors such as cross-range resolution and multipath propagation are discussed as well as improved sonar designs which attempt to push back these limits.

Finally the design of bathymetric imaging systems will be discussed. The two competing designs, which are multi-beam echo-sounders and interferometric systems, will be presented and their respective merits and drawbacks will be discussed using criteria such as area coverage, bathymetric accuracy and spatial resolution as well as robustness. The principles of angle of arrival estimation for random seafloor echoes (rather than echoes of deterministic targets) will be discussed in detail including fundamental factors limiting the accuracy such as baseline decorrelation.

Biography: Marc Pinto was born in Wellington, India in 1960. He graduated from the Ecole Nationale des Ponts et Chaussees, Paris (France) in 1983. From 1985 to 1989 and 1989 to 1993 he worked as a research engineer for Thomson-CSF, specializing in the development of finite element techniques for solving non-linear magnetostatics to support the modeling of the magnetic recording process. In 1991, he received the Ph. D. degree in Solid State Physics from the University of Paris, Orsay. In 1993 he joined Thomson-Sintra ASM (now Thales Underwater Systems) as Head of the Signal Processing Group, specializing in research into advanced MDM and airborne ASW sonar. In 1997 he joined the NATO Saclant Undersea Research Center, La Spezia, Italy as principal scientist. He was appointed Head of the Mine Countermeasures Group, in the Signal and Systems Division in 1998 and held this position until the Group was dissolved in 2000. From 2000 to 2004 he conducted, as project leader, research into synthetic aperture sonar systems for hunting proud and buried mines. In 2004 he was appointed Head of the Expeditionary MCM and Port Protection Department where he presently oversees the research into AUV-based mine-hunting, electronic mine countermeasures and harbour defence.



T06: Synthetic aperture sonar

Dr Roy E Hansen

Time: 1300 – 1630

Room: Bayside 103

This tutorial will describe the principles, benefits and challenges of synthetic aperture sonar (SAS) imaging of the seafloor. The tutorial starts with the basic principles of SAS including derivation of resolution and area coverage. The similarities and differences between SAS, synthetic radar aperture radar (SAR) and seismic exploration will be shown. Next, the frequency dependence in SAS will be discussed. The tutorial continues to describe the challenges in SAS. These are: How to navigate with sufficient accuracy to obtain well focussed images in SAS; The effect of varying ocean environment on SAS; The effect of platform behaviour on SAS. SAS in rough terrain or SAS on non-straight paths; SAS in shallow waters or in areas of multipath; The tutorial will describe critical design for robust SAS, and how to do robust SAS processing. Finally, the tutorial will describe the properties of SAS images, and shows techniques to enhance or suppress specific properties. This includes shadow enhancement, echo enhancement and multi-aspect imagery.

Biography: Roy Edgar Hansen received the M.Sc. degree in physics in 1992, and the Ph.D. in physics in 1999, both from the University of Tromsø, Norway. The Ph.D. thesis title is Measurements in the Mixed Layer by a Bistatic multi-CW Doppler Sonar. From 1992 to 2000 he was with the Norwegian research company TRIAD, working on multistatic sonar, multistatic radar, SAR and underwater communications. Since 2000, he has been working at the Norwegian Defence Research Establishment (FFI), Kjeller, Norway. He is currently principal scientist and project manager for the HUGIN autonomous underwater vehicle development and the synthetic aperture sonar development at FFI. He is also adjunct associated professor at Centre for Imaging at University in Oslo, Norway.



T07: Underwater Communications

Dr Milica Stojanovic & Lee Freitag

Time: 0830 – 1200

Room: Bayside 104



Wireless information transmission is an enabling technology for the development of future ocean-observation systems, whose applications range from marine biology to oil industry, and involve the emerging concepts of cooperating autonomous vehicles and ad-hoc deployable sensor networks. Communication between such devices often relies on transmission of acoustic waves, since electro-magnetic waves propagate only over very short distances underwater. However, acoustic signals are confined to low frequencies (usually no more than several tens of kHz) making the available bandwidth extremely limited.

Within a constrained bandwidth, acoustic communications are governed by propagation that occurs over multiple paths and at low speed (nominally 1500 m/s). Delay spreading over tens or even hundreds of milliseconds results in a frequency-selective signal distortion, while motion creates an extreme Doppler effect. The worst properties of radio channels—poor link quality of a mobile terrestrial channel, and long delay of a satellite channel—thus appear combined in an underwater acoustic channel, which is generally recognized as one of the most difficult communication media in use today.

The quest for high rate communications over these channels is tightly coupled with the use of bandwidth-efficient modulation methods and signal processing solutions that can counteract the channel distortions. Since the early 90's, when adaptive equalization was employed to demonstrate the feasibility of phase-coherent detection underwater, research has yielded innovative signal processing solutions, as well as the first networking concepts for underwater acoustic systems.

This lecture offers a top-level overview of the basic concepts of acoustic communications:

- Channel characteristics: attenuation, noise, multipath and Doppler spreading
- Modulation/detection: single-carrier and multi-carrier (OFDM) broadband methods; equalization, synchronizations, diversity combining; multi-input multi-output (MIMO) communication
- Networking: topology/architecture selection, resource allocation
- Multiple access and channel sharing: deterministic (e.g., TDMA/CDMA) and random (MAC, routing).



Acoustic modem implementation will also be discussed, as it pertains to the Woods Hole Oceanographic Institution's "micro-modem."

Throughout the lecture, the emphasis will be on the fundamental differences between the acoustic and radio systems, and various signal processing concepts will be discussed through a series of experimental data examples, which illustrate transmission over shallow and deep water acoustic channels at highest bit-rates demonstrated to date.

Biography: Dr Milica Stojanovic

Milica Stojanovic graduated from the University of Belgrade, Serbia, in 1988, and received the M.S. and Ph.D. degrees in electrical engineering from Northeastern University, Boston, MA, in 1991 and 1993. After a number of years with the Massachusetts Institute of Technology, where she was a Principal Scientist, she joined the faculty of Electrical and Computer Engineering Department at Northeastern University in 2008. She is also a Guest Investigator at the Woods Hole Oceanographic Institution, and a Visiting Scientist at MIT. Her research interests include digital communications theory, statistical signal processing and wireless networks, and their applications to mobile radio and underwater acoustic communication systems. Milica is an Associate Editor for the IEEE Journal of Oceanic Engineering and the IEEE Transactions on Signal processing.

Biography: Lee Freitag

Lee Freitag holds BS and MS degrees in Electrical Engineering from the University of Alaska, Fairbanks which he received in 1986 and 1987 respectively. He is currently a Senior Engineer at the Woods Hole Oceanographic Institution where he has worked on projects related to underwater acoustics for twenty years. His research programs focus on underwater acoustic communication and navigation with a strong focus on unmanned underwater vehicles, sensors and submarine systems.



T08: AUV technology

Presenter: William Kirkwood

Time: 1300 – 1630

Room: Bayside 104

AUV Application Basics is a short course that provides an overview of current AUV technologies and operations. The objective is to establish a basic understanding of what currently available AUVs for oceanographic applications. The attendee will gain

basic understanding of AUV types, technologies, terminology, and navigation techniques, including discussion of the comparative strengths of AUVs and alternative methods of data collection. The attendee will also be provided an understanding of tradeoffs in AUV operations, including power estimation, endurance considerations, and mission structure to acquire the desired data sets. Key points are illustrated by applications and results from the Monterey Bay Aquarium Research Institute's (MBARI) Dorado AUV and other AUV operations. Topics include: Basic AUV technology, AUV at-sea Operation, Payload Considerations, Mission Planning, Upper and Mid-Water AUV missions, Benthic and Mapping AUV missions, Data Collection and Reduction, AUV Integration into Sampling Networks, and a look at coming AUV advances. The interactive format, using the materials provided, allows the attendee discussion time for relevance and demonstration purposes regarding real or potential AUV plans.

Biography: Bill is a Senior Research and Development Engineer at the Monterey Bay Aquarium Research Institute (MBARI) located in Monterey Bay, California. Bill has a BS in Mechanical Engineering and a MS in Computer Science which he has applied to controls and automation of electromechanical systems and robotics since 1978. Bill has been with MBARI for 19 years as a lead mechanical engineer and program manager developing the Tiburon remotely operated vehicle and Dorado class autonomous underwater vehicles. Bill's current focus is development of underwater instrumentation for science studying hydrates and ocean acidification issues associated with anthropogenic CO₂.



Special Topics



Advances in Integrated Marine Observing Systems

Topic Chair:

Simon Allen

Technical Director, Integrated
Marine Observing System,
University of Tasmania, Hobart,
Australia



Advances in Exploration and Recovery for the Offshore Oil & Gas Industry

Topic Chair:

Dr Jeanne Young

Leader, OCEANMAG project
CSIRO Wealth from Oceans
Flagship
Sydney, Australia



Advances in Understanding of Marine Environments in the Western Pacific

Topic Chairs:

Prof. Toru Sato

Department of Ocean Technology,
Policy, and Environment
University of Tokyo
Tokyo, Japan



Prof. Yusaku Kyojuka

Department of Environmental
Fluid Science and Technology
Kyushu University
Kasuga, Japan



Prof. Beom-Soo Hyun
Division of Naval Architecture and
Ocean Systems Engineering
Korea Maritime University
Busan, Korea



Dr Dong-Jiing Doong
Department of Marine
Environmental Informatics
National Taiwan Ocean University
Keelung, Taiwan R.O.C.



**Advances in Marine
Management**

Topic Chair:
Dr Peter Doherty
Research Director, Australian
Institute of Marine Science
Townsville, Australia



**Advances in Underwater
Imaging and Mapping**

Topic Chair:
Dr Marc Pinto
NURC, a NATO Research Centre
La Spezia, Italy



Program Monday 24 May

Tutorials

All OCEANS '10 tutorials take place on Monday 24 May 2010. Morning session tutorials begin at 08:30. Afternoon session tutorials begin at 13:00.

T01: Shallow water acoustics

Presenter: Prof. William Carey

Time: 0830 - 1200

Room: Bayside 101

T02: High Frequency Surface Wave Radar

Presenter: Dr Stuart Anderson

Time: 1300 - 1630

Room: Bayside 101

T03: Stochastic matched filters for sonar signals

Time: 0830 - 1200

Room: Bayside 102

T04: Localisation and Mapping

Presenter: Dr Stefan Williams

Time: 1300 - 1630

Room: Bayside 102

T05: Overview of high resolution sonar

Presenter: Dr Marc Pinto

Time: 0830 - 1200

Room: Bayside 103

T06: Synthetic aperture sonar

Presenter: Dr Roy E Hansen

Time: 1300 - 1630

Room: Bayside 103

T07: Underwater Communications

Presenter: Dr Milica Stojanovic & Lee Freitag

Time: 0830 - 1200

Room: Bayside 104

T08: AUV technology

Presenter: William Kirkwood

Time: 1300 - 1630

Room: Bayside 104



Program Tuesday 25 May

Conference Welcome and Plenary Sessions

Room: Bayside Auditorium A

Session Time: 0830 – 1030

0830-0900 Conference Welcome
Welcome Address: Prof. Mary O’Kane,
NSW Chief Scientist & Scientific
Engineer

0900-0930 Plenary Talk 1: Craig McLean,
National Oceanic & Atmospheric
Administration: *Meeting Social
Challenges Using Marine Technology*

0930-1000 Plenary Talk 2: CDRE Bruce Kafer,
Royal Australian Navy: *Understanding
the Oceans – a Navy Perspective*

1000-1030 Plenary Talk 3: Dr Neville Smith,
Bureau of Meteorology, Australia:
*Why Ocean Science Matters for
Australia*

1030-1100 Morning Tea, Bayside Grand Hall

1100-1115 Open Exhibition, Bayside Grand Hall

1115-1700 Exhibition, Bayside Grand Hall

1200-1300 Lunch, Bayside Grand Hall



Technical Sessions

TUESDAY 1:00PM – 2:45PM

E-M and opto-acoustic sensing

Bayside 101

Tuesday, May 25 (1:00PM - 2:45PM)

Chair: Roy Hughes, DSTO

Opto-Acoustic Underwater Remote Sensing (OAURS) - An Optical Sonar?

David Farrant, *CSIRO Materials Science & Engineering, Australia*

Jan Burke, *CSIRO Materials Science & Engineering, Australia*

Laurence Dickinson, *CSIRO Materials Science & Engineering, Australia*

Philip Fairman, *CSIRO Materials Science & Engineering, Australia*

John Wendoloski, *Defence Science & Technology Organisation, Australia*

Development Of A High Temperature Superconducting Magnetic Tensor Gradiometer For Underwater UXO Detection

Jeanne Young, *CSIRO Materials Science & Engineering, Australia*

David Clark, *CSIRO Materials Science & Engineering, Australia*

Shane Keenan, *CSIRO Materials Science & Engineering, Australia*

Peter Sullivan, *CSIRO Materials Science & Engineering, Australia*

Stephen Billings, *Sky Research Inc, USA*

Requirements For Unexploded Ordnance Detection And Discrimination In The Marine Environment Using Magnetic And Electromagnetic Sensors

Stephen Billings, *Sky Research Inc, USA*

Fridon Shubitidze, *Sky Research Inc, USA*

Leonard Pasion, *Sky Research Inc, USA*

Laurens Beran, *Sky Research Inc, USA*

Jack Foley, *Sky Research Inc, USA*



Underwater communications 1

Bayside 102

Tuesday, May 25 (1:00PM - 2:45PM)

Chair: Michael Frater, AFDA

Experimental Results On Adaptive MMSE Turbo Equalization In Shallow Underwater Acoustic Communication

Christophe Laot, *Télécom Bretagne, France*

Pascal Coince, *Sercel, France*

Check And Validate Reed Solomon Block Turbo Codes In Shallow Underwater Acoustic Communication

Joël TRUBUIL, *Télécom Bretagne, France*

André GOALIC, *Télécom Bretagne, France*

Christophe LAOT, *Télécom Bretagne, France*

Nicolas BEUZELIN, *Groupe & Etudes Sous-Marines de l'Atlantique, France*

On Joint Acoustic Communication And Positioning Through MFSK-Modulated Signals And Costas Arrays

Sébastien PENNEC, *IXSEA, France*

Gildas Touin, *IXSEA, France*

Stéphane Azou, *Laboratoire des sciences et techniques de l'information de la communication et de la connaissance, France*

Ludovic Collin, *Laboratoire des sciences et techniques de l'information de la communication et de la connaissance, France*

Coherent And Differential Acoustic Communication In Shallow Water Using Transmitter And Receiver Arrays

Dmitry Chizhik, *Bell Laboratories, USA*

Allan Rosenberg, *Johns Hopkins University, Applied Physics Laboratory, USA*

Qinqing Zhang, *Johns Hopkins University, Applied Physics Laboratory, USA*

Underwater Acoustic QPSK Receiver Implementation And Its Test Results At The Very Shallow Water

Seung-Geun Kim, *Maritime & Ocean Engineering Research Institute / Korea Ocean Research & Development Institute*

Sea-Moon Kim, *Maritime & Ocean Engineering Research*



Institute / Korea Ocean Research & Development Institute
Sung-Hoon Byun, Maritime & Ocean Engineering Research
Institute / Korea Ocean Research & Development Institute
Jong-Won Park, Maritime & Ocean Engineering Research
Institute / Korea Ocean Research & Development Institute
Changho Yun, Maritime & Ocean Engineering Research
Institute / Korea Ocean Research & Development Institute
Young-Kon Lim, Maritime & Ocean Engineering Research
Institute / Korea Ocean Research & Development Institute

Advances in integrated marine observing systems 1
Bayside 103

Tuesday, May 25 (1:00PM - 2:45PM)

Chair: **Simon Allen**, *University of Tasmania*

Connecting The Dots: Ocean Observing Systems And Public Policy

Martin Taylor, Ocean Networks Canada

Brian Bornhold, Coastal and Ocean Resources Inc, Canada

The VENUS Facility - A Bottom-Up Approach To Building An Ocean Observing System

Paul Macoun, VENUS Facility, University of Victoria, Canada

Adrian Round, VENUS Facility, University of Victoria, Canada

Richard Dewey, VENUS Facility, University of Victoria, Canada

Integrating Observation Systems: An Example From The Great Barrier Reef

Scott Bainbridge, Australian Institute of Marine Science

Craig Steinberg, Australian Institute of Marine Science

Mal Heron, James Cook University, Australia

Miles Furnas, Australian Institute of Marine Science

BLUElink: An Integrator Of The Integrated Marine Observing System

David Griffin, CSIRO Wealth from Oceans Flagship, Australia

Peter Oke, CSIRO Wealth from Oceans Flagship, Australia



Advances In The Gulf Of Maine Ocean Observing System: Technical Capabilities And Scientific Results

Neal Pettigrew, *University of Maine, USA*

Charles Fikes, *University of Maine, USA*

M. Beard, *University of Maine, USA*

Autonomous underwater vehicles 1

Bayside 104

Tuesday, May 25 (1:00PM - 2:45PM)

Co-Chairs: **David Lane**, *Heriot-Watt University, UK*

Torsten Pfuetzenreuter, *Fraunhofer
Application Center System Technology,
Germany*

ConSys - A New Software Framework For Underwater Vehicles

Torsten Pfuetzenreuter, *Fraunhofer Application Center
System Technology, Germany*

Helge Renkewitz, *Fraunhofer Application Center System
Technology, Germany*

MarineSIM : Robot Simulation For Marine Environment

P.G. Chaminda Senarathne, *Nanyang Technological
University, Singapore*

Wijerupage Wijesoma, *Nanyang Technological University,
Singapore*

Kwang Lee, *DSO National Laboratories, Singapore*

Bharath Kalyan, *Nanyang Technological University,
Singapore*

Diluka Moratuwage, *Nanyang Technological University,
Singapore*

Nicholas Patrikalakis, *Massachusetts Institute of
Technology, USA*

Franz Hover, *Massachusetts Institute of Technology, USA*

A Versatile Underwater Tracking System For AUV Testing

Jesse Pentzer, *University of Idaho, USA*

Douglas Odell, *Naval Surface Warfare Center, Carderock
Division, Acoustic Research Detachment, USA*

John Canning, *Center for Intelligent Systems Research,
University of Idaho, USA*



Dean Edwards, *Center for Intelligent Systems Research,
University of Idaho, USA*

A Tool Chain For AUV System Testing

Marco Jacobi, *Fraunhofer IOSB-AST, Germany*

Thomas Rauschenbach, *Fraunhofer IOSB-AST, Germany*

The Memorial Explorer: Developing The Role Of AUVs In Under-Ice Research

Peter King, *Memorial University of Newfoundland, Canada*

Ron Lewis, *Memorial University of Newfoundland, Canada*

Dan Walker, *Memorial University of Newfoundland, Canada*

Polly Alexander, *University of Tasmania, Australia*

Neil Bose, *University of Tasmania, Australia*

Anthony Worby, *Australian Antarctic Division*

Array signal processing and array design 1

Bayside 105

Tuesday, May 25 (1:00PM - 2:45PM)

Chair: Michael Clark, *Thales*

Optimal Spatial Filtering Of Real Data From Submarine Sonar Arrays

Brian Ferguson, *Defence Science & Technology
Organisation, Australia*

Dragana Carevic, *Defence Science & Technology
Organisation, Australia*

Multipath Reduction For Bathymetry Using Adaptive Beamforming

Ann Blomberg, *University of Oslo, Norway*

Michael Hayes, *University of Canterbury, New Zealand*

Iterative Adaptive Approach For Wide-Band Active Sonar Array Processing

Zhaofu Chen, *University of Florida, USA*

Jian Li, *University of Florida, USA*

Petre Stoica, *Uppsala University, Sweden*

Kam Lo, *Defence Science & Technology Organisation,
Australia*



**Near-Field Beamforming For A Multi-Beam Echo
Sounder - Approximation And Error Analysis**

Ying Jiang, *Zhejiang University, China*

Wen Xu, *Zhejiang University, China*

Lingsheng Chen, *Zhejiang University, China*

Xiang Pan, *Zhejiang University, China*

**Comparison Of The Performance Of Time Domain
And Time-Frequency Domain Adaptive Beamforming**

Chaoying Bao, *Defence Science & Technology
Organisation, Australia*

George Farag, *University of Western Australia*

Jie Pan, *University of Western Australia*

Sound propagation and scattering

Bayside 106

Tuesday, May 25 (1:00PM - 2:45PM)

Chair: Chris Gillard, *DSTO*

**Modelling Acoustic Reflection Loss At The Ocean
Surface For Small Angles Of Incidence**

Adrian Jones, *Defence Science & Technology
Organisation, Australia*

Alec Duncan, *Centre for Marine Science & Technology,
Curtin University of Technology, Australia*

Amos Maggi, *Centre for Marine Science & Technology,
Curtin University of Technology, Australia*

Janice Sendt, *Thales, Australia*

Paul Clarke, *Defence Science & Technology Organisation,
Australia*

**On Some Rigorous Computational Ocean-Acoustic
Modelling Tools**

David Bartel, *Defence Science & Technology Organisation,
Australia*

Calcarenite As A Poroelastic Granular Medium

Nicholas Chotiros, *Applied Research Laboratories,
University of Texas, USA*

Marcia Isakson, *Applied Research Laboratories, University
of Texas, USA*



Sonar Uncertainty And Sensitivity Analysis Techniques

Douglas Sweet, *Defence Science & Technology Organisation, Australia*

Chris Gillard, *Defence Science & Technology Organisation, Australia*

Student poster oral presentation 1

Bayside 107

Tuesday, May 25 (1:00PM - 2:45PM)

Co-Chairs: **Stefan Williams**, *University of Sydney*
 Norm Miller, *IEEE/OES*

A Maximum Entropy Framework For Statistical Modeling Of Underwater Acoustic Communication Channels

François-Xavier Socheleau, *Télécom Bretagne, France*

Christophe Laot, *Télécom Bretagne, France*

Jean-Michel Passerieux, *Thales Underwater Systems, France*

Target Tracking In State Dependent Wake Clutter

Edmund Brekke, *Unik, Norway*

Oddvar Hallingstad, *Unik, Norway*

John Glattetre, *Kongsberg Maritime, Norway*

Underwater Glider Propulsion Using Chemical Hydrides

Jo Borchsenius, *Auckland University of Technology, New Zealand*

Shane Pinder, *Auckland University of Technology, New Zealand*

Time Reversal Mirror: Temporal And Spatial Focusing Tool

Divya Parihar, *Indian Institute of Technology Delhi*

Ankit Agarwal, *Indian Institute of Technology Delhi*

Monika Agrawal, *Indian Institute of Technology Delhi*

Video-Image Processing Applied To The Analysis Of The Behaviour Of Deep-Water Lobsters (*Nephrops norvegicus*)

Sergi Pons Freixes, *Marine Technology Unit, Centre Mediterrani d'Investigacions Marines i Ambientals, Spain*



Jaume Piera, *Marine Technology Unit, Centre Mediterrani d'Investigacions Marines i Ambientals, Spain*

Jacopo Aguzzi, *Institute of Marine Sciences, Centre Mediterrani d'Investigacions Marines i Ambientals, Spain*

Constrained Stereo Correspondence For 3D Sea-Floor Reconstruction

Gabrielle Inglis, *University of Rhode Island, USA*

Chris Roman, *University of Rhode Island, USA*

Water Column Current Profile Aided Localisation For Autonomous Underwater Vehicles

Lashika Medagoda, *Australian Centre for Field Robotics, University of Sydney, Australia*

Stefan Williams, *Australian Centre for Field Robotics, University of Sydney, Australia*

Michael Jakuba, *Australian Centre for Field Robotics, University of Sydney, Australia*

Oscar Pizarro, *Australian Centre for Field Robotics, University of Sydney, Australia*

TUESDAY 3:15PM – 5:00PM

High frequency radars

Bayside 101

Tuesday, May 25 (3:15PM - 5:00PM)

Chair: **Stuart Anderson**, *Defence Science & Technology Organisation, Australia*

Further Analysis Of The Modulation Of High Frequency Radar Spectra Due To Sea-Induced Antenna Platform Motion

John Walsh, *Memorial University of Newfoundland, Canada*

Bernard Ryan, *Memorial University of Newfoundland, Canada*

Eric Gill, *Memorial University of Newfoundland, Canada*

Jacques El Khoury, *Ecole Supérieure d'Electricité (Supelec), France*

Wind Direction Manifestation On HF Ocean Radar Echoes

Malcolm Heron, *Australian Coastal Ocean Radar Network*

Peter Marrone, *Darwinmont Technologies, Australia*



The Use Of HF Radar Surface Currents For Computing Lagrangian Trajectories: Benefits And Issues

Alessandra Mantovanelli, *James Cook University, Australia*

Malcolm Heron, *James Cook University, Australia*

Arnstein Prytz, *James Cook University, Australia*

Rapid Deployable HF Radar For Norwegian Emergency Spill Operations

Chad Whelan, *CODAR Ocean Sensors, Ltd., USA*

Anton Kjelaas, *CodarNor AS, Norway*

Donald Barrick, *CODAR Ocean Sensors, Ltd., USA*

Peter Lilleboe, *CODAR Ocean Sensors, Ltd., USA*

Vicente Fernandez, *Qualitas Remos, Spain*

Andrés Martirena, *Qualitas Remos, Spain*

Øyvind Breivik, *Norwegian Meteorological Institute*

Bruce Hackett, *Norwegian Meteorological Institute*

Can Vertical Mixing From Turbulent Kinetic Energy Mitigate Coral Bleaching? An Application Of HF Ocean Radar

Diane DiMassa, *Massachusetts Maritime Academy, USA*

Malcolm Heron, *James Cook University, Australia*

Alessandra Mantovanelli, *James Cook University, Australia*

Scott Heron, *National Oceanographic & Atmospheric Administration, USA*

Craig Steinberg, *Australian Institute of Marine Science*

Underwater communications 2

Bayside 102

Tuesday, May 25 (3:15PM - 5:00PM)

Chair: **Craig Benson**, *University of New South Wales, Australia*

Acoustic Modems, Navigation Aids, And Networks For Undersea Operations

Dale Green, *Teledyne Benthos, USA*

Design Of A Low-Cost Short-Range Underwater Acoustic Modem

Bridget Benson, *University of California San Diego, USA*



Ying Li, *University of California San Diego, USA*

Brian Faunce, *University of California San Diego, USA*

Kenneth Domond, *California Institute for
Telecommunications and Information Technology, USA*

Donald Kimball, *California Institute for
Telecommunications and Information Technology, USA*

Curt Schurgers, *University of California San Diego, USA*

Ryan Kastner, *University of California San Diego, USA*

Design Of A High Frequency FPGA Acoustic Modem For Underwater Communication

Nusrat Nowsheen, *University of New South Wales,
Australia*

Craig Benson, *University of New South Wales, Australia*

Michael Frater, *University of New South Wales, Australia*

DSP Implementation Of Siso And MIMO OFDM Acoustic Modems

Hai Yan, *University of Connecticut, USA*

Shengli Zhou, *University of Connecticut, USA*

Zhijie Shi, *University of Connecticut, USA*

Jun-Hong Cui, *University of Connecticut, USA*

Lei Wan, *University of Connecticut, USA*

Jie Huang, *University of Connecticut, USA*

Hao Zhou, *University of Connecticut, USA*

The Design And Experiment Of A Software-Defined Acoustic Modem For Underwater Sensor Network

Yu Li, *Institute of Acoustics, Chinese Academy of
Sciences*

Haining Huang, *Institute of Acoustics, Chinese Academy
of Sciences*

Advances in exploration and recovery for the offshore oil & gas industry

Bayside 103

Tuesday, May 25 (3:15PM - 5:00PM)

Chair: **Jeanne Young**, *CSIRO Materials Science &
Engineering, Australia*

Offshore Petroleum Exploration From Space

Magnus Wettle, *Geoscience Australia*

Paul Daniel, *CSIRO Land & Water, Australia*



Graham Logan, *Geoscience Australia*

Medhavy Thankappan, *Geoscience Australia*

Correction Of Electric And Magnetic Fields And Gradients Measured Within And Around An Insulating Sensor Capsule In Seawater

David Clark, *CSIRO Materials Science & Engineering, Australia*

Development Of An Arrayed Hydrocarbon Sensing System For The Detection Of Seeped Hydrocarbons

Xiubin Qi, *CSIRO Earth Science & Resource Engineering, Australia*

Emma Crooke, *CSIRO Earth Science & Resource Engineering, Australia*

Andrew Ross, *CSIRO Earth Science & Resource Engineering, Australia*

The Assessment And Evolution Of Offshore Gas Hydrate Deposits Using Seafloor Controlled Source Electromagnetic Methodology

Nigel Edwards, *University of Toronto, Canada*

Reza Mir, *University of Toronto, Canada*

Ele Willoughby, *University of Toronto, Canada*

Katrin Schwalenberg, *Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), Germany*

Carsten Scholl, *Fugro Electro Magnetic GmbH, Germany*

Proven High Efficiency Anchor For Harsh Cyclonic Environments

Evan Zimmerman, *Delmar, USA*

Vehicle navigation 1

Bayside 104

Tuesday, May 25 (3:15PM - 5:00PM)

Co-Chairs: Wen Xu, Zhejiang University, China

Eric Wolbrecht, University of Idaho

AUV Navigation With An Extended Kalman Filter In A Magnetic Disturbance

Benjamin Armstrong, *University of Idaho, USA*

Eric Wolbrecht, *University of Idaho, USA*

Dean Edwards, *Center for Intelligent Systems Research, University of Idaho, USA*



USBL Pose Estimation Using Multiple Responders

Leif Christensen, *DFKI Bremen - Robotics Innovation Center, Germany*

Martin Fritsche, *DFKI Bremen - Robotics Innovation Center, Germany*

Jan Albiez, *DFKI Bremen - Robotics Innovation Center, Germany*

Frank Kirchner, *DFKI Bremen - Robotics Innovation Center, Germany*

AUV Positioning Based On Interactive Multiple Model

Hongqing Liu, *Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Mandar Chitre, *Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Rui Gao, *Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Cooperative Positioning Using Range-Only Measurements Between Two AUVs

Rui Gao, *Tropical Marine Science Institute, National University of Singapore*

Mandar Chire, *Tropical Marine Science Institute, National University of Singapore*

Log Sensor Calibration Using M-Estimate

Daxiong Ji, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Jian LIU, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Kaizhou LIU, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Autonomous underwater vehicles 2

Bayside 105

Tuesday, May 25 (3:15PM - 5:00PM)

Chair: Justin Manley, *Liquid Robotics, USA*

Sensing The Underwater Acoustic Environment With A Single Hydrophone Onboard An Undersea Glider

Brian Ferguson, *Defence Science & Technology Organisation, Australia*

Kam Lo, *Defence Science & Technology Organisation,*



Australia

Joshua Rodgers, *Defence Science & Technology
Organisation, Australia*

**Estimation Of Wave Parameters From Accelerometry
Data To Aid AUV-Shore Communication**

Arvind de Menezes Pereira, *University of Southern
California, USA*

Gaurav Sukhatme, *University of Southern California, USA*

**Slocum Glider Energy Measurement And Simulation
Infrastructure**

Hans Woithe, *Rutgers University, USA*

Ulrich Kremer, *Rutgers University, USA*

Ivan Seskar, *Rutgers University, USA*

Oscar Schofield, *Rutgers University, USA*

Scott Glenn, *Rutgers University, USA*

Murium Iqbal, *Rutgers University, USA*

David Aragon, *Rutgers University, USA*

Ilya Chigirev, *Rutgers University, USA*

Yuriy Shames, *Rutgers University, USA*

**Hydrodynamic Implications For Submarine Launched
Underwater Gliders**

Joshua Rodgers, *Defence Science & Technology
Organisation, Australia*

John Wharington, *Defence Science & Technology
Organisation, Australia*

**Motion Characteristic Analysis Of A Hybrid-Driven
Underwater Glider**

Shuxin Wang, *Tianjin University, China*

Xiujun Sun, *Tianjin University, China*



Imaging and vision

Bayside 106

Tuesday, May 25 (3:15PM - 5:00PM)

Co-Chairs: **Christopher Roman**, *University of Rhode Island, USA*

Roman Ilin, *Air Force Research Laboratory, USA*

Simultaneous Detection And Tracking Of Multiple Objects In Noisy And Cluttered Environment Using Maximum Likelihood Estimation Framework

Roman Ilin, *Air Force Research Laboratory, USA*

Ross Deming, *Solid State Scientific Corporation, USA*

Underwater Object Reconstruction Method For 3D Target Recognition In An Autonomous Underwater Vehicle.

Pavan Kumar Ambekar, *Rashtriya Vidhyalaya College of Engineering, India*

Mutanna Kadal, *Indian Institute of Science*

Karthik Sheshadri, *Rashtriya Vidhyalaya College of Engineering, India*

Application Of Structured Light Imaging For High Resolution Mapping Of Underwater Archaeological Sites

Christopher Roman, *University of Rhode Island, USA*

Gabrielle Inglis, *University of Rhode Island, USA*

James Rutter, *University of Rhode Island, USA*

An Approach Of Image Decomposition For Underwater Target Detection By Inhomogeneous Illumination Based On G-Space And PDE

Haiyong Zheng, *Ocean University of China*

Bing Zheng, *Ocean University of China*

Guangrong Ji, *Ocean University of China*



Student poster oral presentation 2

Bayside 107

Tuesday, May 25 (3:15PM - 5:00PM)

Co-Chairs: **Stefan Williams**, *University of Sydney*
Norm Miller, *IEEE/OES*

Modeling Underwater Acoustic Communications For Multi-Robot Missions In A Robotics Simulator

Anuj Sehgal, *Jacobs University, Germany*

Daniel Cernea, *Jacobs University, Germany*

Andreas Birk, *Jacobs University, Germany*

The Signal-To-Noise Ratio Of Human Divers

Edmund Brekke, *Unik, Norway*

Oddvar Hallingstad, *Unik, Norway*

John Glattetre, *Kongsberg Maritime, Norway*

Station Keeping Of Small Outboard-Powered Boats

Aaron Fisher, *Florida Atlantic University, USA*

James VanZwieten, *Florida Atlantic University, USA*

Tannen VanZwieten, *NASA Marshall Space Flight Center, USA*

Probabilistic Sonar Scan Matching SLAM For Underwater Environment

Angelos Mallios, *Universitat de Girona, Spain*

Pere Ridao, *Universitat de Girona, Spain*

David Ribas, *Universitat de Girona, Spain*

Emilli Hernandez, *Universitat de Girona, Spain*

Particle Diversity Reduction For AUV'S Active Localisation

Francesco Maurelli, *Heriot-Watt University, UK*

Yvan Petillot, *Heriot-Watt University, UK*

Rugosity, Slope And Aspect Derived From Bathymetric Stereo Image 3D Reconstructions

Ariell Friedman, *Australian Centre for Field Robotics, University of Sydney, Australia*

Oscar Pizarro, *Australian Centre for Field Robotics, University of Sydney, Australia*



Stefan Williams, *Australian Centre for Field Robotics,
University of Sydney, Australia*

**Dirichlet Process Mixture Models For Autonomous
Habitat Classification**

Daniel Steinberg, *Australian Centre for Field Robotics,
University of Sydney, Australia*

Oscar Pizarro, *Australian Centre for Field Robotics,
University of Sydney, Australia*

Stefan Williams, *Australian Centre for Field Robotics,
University of Sydney, Australia*

Michael Jakuba, *Australian Centre for Field Robotics,
University of Sydney, Australia*



Program Wednesday 26 May

WEDNESDAY 8:30AM – 10:15AM

Current measurement technology

Bayside 101

Wednesday, May 26 (8:30AM - 10:15AM)

Co-Chairs: **Albert Williams**, *Woods Hole Oceanographic Institution, USA*

Mal Heron, *James Cook University, Australia*

Motion Tracking In An Acoustic Point-Measurement Current Meter

Albert Williams, *Woods Hole Oceanographic Institution, USA*

Fredrik Thwaites, *Woods Hole Oceanographic Institution, USA*

Archie Morrison, *Nobska Development, Inc., USA*

John Toole, *Woods Hole Oceanographic Institution, USA*

Richard Krishfield, *Woods Hole Oceanographic Institution, USA*

High-Frequency Radar Two-Station Baseline Bisector Comparisons Of Radial Components

Daniel Atwater, *James Cook University, Australia*

Mal Heron, *James Cook University, Australia*

Sea Surface Current Mapping By Radar Doppler Current Profiler

Marius Cysewski, *Department of Radar Hydrography, GKSS Research Center, Germany*

Friedwart Ziemer, *Department of Radar Hydrography, GKSS Research Center, Germany*

Joerg Seemann, *Department of Radar Hydrography, GKSS Research Center, Germany*

The First Chinese Coastal Acoustic Tomography Experiment

Xiao-Hua ZHU, *State Key Laboratory of Satellite Ocean Environment Dynamics, Second Institute of Oceanography, State Oceanic Administration, China*

Arata Kaneko, *Graduate School of Engineering, Hiroshima University, Japan*

Qingsong Wu, *State Key Laboratory of Satellite Ocean*



*Environment Dynamics, Second Institute of
Oceanography, State Oceanic Administration, China*

*Noriaki Gohda, Graduate School of Engineering, Hiroshima
University, Japan*

*Chuanzheng Zhang, State Key Laboratory of Satellite
Ocean Environment Dynamics, Second Institute of
Oceanography, State Oceanic Administration, China*

*Naokazu Taniguchi, Graduate School of Engineering,
Hiroshima University, Japan*

Reciprocal Sound Transmission Experiments For Current Measurement In A Tidal River

*Chuanzheng Zhang, State Key Laboratory of Satellite
Ocean Environment Dynamics, Second Institute of
Oceanography, State Oceanic Administration, China*

*Xiao-Hua ZHU, State Key Laboratory of Satellite Ocean
Environment Dynamics, Second Institute of
Oceanography, State Oceanic Administration, China*

*Arata Kaneko, Graduate School of Engineering, Hiroshima
University, Japan*

*Qingsong Wu, State Key Laboratory of Satellite Ocean
Environment Dynamics, Second Institute of
Oceanography, State Oceanic Administration, China*

*Xiaopeng Fan, Second Institute of Oceanography, State
Oceanic Administration, China*

*Bo Li, Second Institute of Oceanography, State Oceanic
Administration, China*

*Guanghong Liao, Second Institute of Oceanography, State
Oceanic Administration, China*

*Tao Zhang, Second Institute of Oceanography, State
Oceanic Administration, China*

Sonar signal processing 1

Bayside 102

Wednesday, May 26 (8:30AM - 10:15AM)

Chair: **Peter Gough**, *Acoustics Research Group,
University of Canterbury, New Zealand*

Sonar Waveform Design For Optimum Target Detection: The Impact Of Object Burial State

Brandon Hamschin, University of Pittsburgh, USA

Patrick Loughlin, University of Pittsburgh, USA



Detection Of Weak Signals In Non-Gaussian Noise Using Nonlinear Wavelet Denoising

Zahra Madadi Ardekani, *Nanyang Technological University, Singapore*

Gargeshwari Anand, *Department of Electrical Communication Engineering, Indian Institute of Science*

Benjamin Premkumar, *Nanyang Technological University, Singapore*

Chiew Tong Lau, *Nanyang Technological University, Singapore*

An Improvement To The Pulse Compression Scheme

Philippe Courmontagne, *Institut Supérieur de l'Electronique et du Numerique Toulon, France*

Gregory Julien, *French Research Institute for Exploitation of the Sea*

Marie-Edith Bouhier, *French Research Institute for Exploitation of the Sea*

Acceleration Of Underwater Acoustic Source Localization Algorithms On The CELL Multi-Core Processor Via Vectorization

Neena Imam, *Oak Ridge National Laboratory, USA*

Jacob Barhen, *Oak Ridge National Laboratory, USA*

Travis Humble, *Oak Ridge National Laboratory, USA*

Recovering Data And Voice Recorders Following At-Sea Crashes

Dale Green, *Teledyne Benthos, USA*

Advances in marine management

Bayside 103

Wednesday, May 26 (8:30AM - 10:15AM)

Chair: **Douglas Cato**, *Defence Science & Technology Organisation / University of Sydney, Australia*
Diane di Massa, *Massachusetts Maritime Academy, USA*

Smart Sensors - A New Paradigm For Marine Management: An Example From The Great Barrier Reef

Scott Bainbridge, *Australian Institute of Marine Science*

Damien Eggeling, *Australian Institute of Marine Science*



Geoff Page, *Australian Institute of Marine Science*

Acoustic Surveying For Beaked Whales In The Coral Sea As A Mitigation Measure For Naval Exercises.

Douglas Cato, *Defence Science & Technology Organisation / University of Sydney, Australia*

Mark Savage, *Defence Science & Technology Organisation, Australia*

Rebecca Dunlop, *University of Queensland, Australia*

Iain Parum, *Curtin University, Australia*

Michelle Blewitt, *University of Sydney, Australia*

Sue Gibbs, *Macquarie University, Australia*

David Donnelly, *Dolphin Research Institute, Australia*

Jane Cleary, *Defence Science & Technology Organisation, Australia*

Robert McCauley, *Curtin University, Australia*

Developments In Mapping Of Seabed Habitats For Marine Protected Area Planning And Monitoring

Alan Jordan, *New South Wales Department of Environment, Climate Change and Water, Australia*

Peter Davies, *New South Wales Department of Environment, Climate Change and Water, Australia*

Tim Ingleton, *New South Wales Department of Environment, Climate Change and Water, Australia*

Edwina Mesley, *New South Wales Department of Environment, Climate Change and Water, Australia*

Joe Neilson, *New South Wales Department of Environment, Climate Change and Water, Australia*

Tim Pritchard, *New South Wales Department of Environment, Climate Change and Water, Australia*

Using An Autonomous Underwater Vehicle To Inform Management Of Biodiversity In Shelf Waters

Neville Barrett, *University of Tasmania, Australia*

Tara Anderson, *Geoscience Australia*

Stefan Williams, *Australian Centre for Field Robotics, University of Sydney, Australia*

Nicole Hill, *Tasmanian Aquacultures & Fisheries Institute, Australia*

Jan Seiler, *Tasmanian Aquacultures & Fisheries Institute, Australia*

Scott Nicol, *Geoscience Australia*



Autonomous underwater vehicles 3

Bayside 104

Wednesday, May 26 (8:30AM - 10:15AM)

Co-Chairs: **Oscar Pizarro**, *Australian Centre for Field Robotics*

Daniel Sgarioto, *Defence Technology Agency, New Zealand*

High Resolution, Consistent Navigation And 3D Optical Reconstructions From AUVs Using Magnetic Compasses And Pressure-Based Depth Sensors

Michael Jakuba, *Australian Centre for Field Robotics, University of Sydney, Australia*

Oscar Pizarro, *Australian Centre for Field Robotics, University of Sydney, Australia*

Stefan Williams, *Australian Centre for Field Robotics, University of Sydney, Australia*

Adaptive Behaviour For An Autonomous Underwater Vehicle To Perform Chemical Mappings

Breen Jeremy, *Tasmanian Information & Communication Technologies Centre, Australia*

Paulo de Souza, *Tasmanian Information & Communication Technologies Centre, Australia*

Timms Greg, *Tasmanian Information & Communication Technologies Centre, Australia*

Ollington Robert, *School of Computing and Information Systems, University of Tasmania, Australia*

Reactive AUV Motion For Thermocline Tracking

Nuno Cruz, *Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal*

Aníbal Matos, *Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal*

A Sub-Region Priority Reaching Control Scheme With A Fuzzy-Logic Algorithm For An Underwater Vehicle Subject To Uncertain Restoring Forces

Zool Ismail, *School of Engineering and Physical Sciences, Heriot-Watt University, UK*

Matthew Dunnigan, *School of Engineering and Physical Sciences, Heriot-Watt University, UK*



**The Influence Of Tidal Currents On The REMUS
Autonomous Underwater Vehicle**

Daniel Sgarioto, *Defence Technology Agency, New Zealand*

Numerical modeling and simulation

Bayside 105

Wednesday, May 26 (8:30AM - 10:15AM)

Chair: Frederick Maltz, *Consultant*

**Numerical Simulation Of Deep-Towed Streamer Cable
In Ocean Current By ALE Finite Element Method**

Junichi Takekawa, *Kyoto University, Japan*

Hitoshi MIKADA, *Kyoto University, Japan*

Tada-nori GOTO, *Kyoto University, Japan*

Eiichi ASAKAWA, *JGI Inc., Japan*

Takuya SHIMURA, *Japan Agency for Marine-Earth Science
and Technology*

Simple Karman Street Model

Cecilia Tapia Siles, *Italian Institute of Technology*

Ryad Chellali, *Italian Institute of Technology*

**3D Simulation Of Robotic Fish Interactions With
Physic-Based Underwater Environment**

Laura Taverna, *Italian Institute of Technology*

Ryad Chellali, *Italian Institute of Technology*

Lorenzo Rossi, *Italian Institute of Technology*

**Time Domain Numerical Simulation Of Microwave
Backscattering From Sea Surface For Radar Remote
Sensing**

Takero Yoshida, *Department of Ocean Technology Policy &
Environment, University of Tokyo, Japan*

Chang-Kyu Rheem, *IIS, The university of Tokyo, Japan*

**Validation Of Numerical Model For Bubble Dispersion
Over A Hydrofoil**

Shuang Zhu, *University of Melbourne, Australia*

Andrew Ooi, *University of Melbourne, Australia*

Hugh Blackburn, *Monash University, Australia*

Brendon Anderson, *Defence Science & Technology
Organisation, Australia*



Systems and observatories 1

Bayside 106

Wednesday, May 26 (8:30AM - 10:15AM)

Co- Andrew Clark, CSnet International, Inc., USA

Chairs: Neal Pettigrew, University of Maine, USA

November 2009 Tropical Cyclone Phyan In The Eastern Arabian Sea: Oceanic Response Along West India Coast And Kavaratti Lagoon

Antony Joseph, *National Institute of Oceanography, India*

R Prabhudesai, *National Institute of Oceanography, India*

Prakash Mehra, *National Institute of Oceanography, India*

Vijay Kumar, *National Institute of Oceanography, India*

Yogesh Agarvadekar, *National Institute of Oceanography, India*

Ryan Luis, *National Institute of Oceanography, India*

Pradhan Rivankar, *National Institute of Oceanography, India*

Blossom Viegas, *National Institute of Oceanography, India*

A Combined Benthic Grab And Observation System For Rapid Assessment Of Water Column And Seabed

Matthew Sherlock, *CSIRO Marine & Atmospheric Research, Australia*

Rudy Kloser, *CSIRO Marine & Atmospheric Research, Australia*

Tim Ryan, *CSIRO Marine & Atmospheric Research, Australia*

Alan Williams, *CSIRO Marine & Atmospheric Research, Australia*

The Coral Proto Free Ocean Carbon Enrichment System (CP-FOCE): Engineering And Development

Malcolm Marker, *University of Queensland, Australia*

David Kline, *University of Queensland, Australia*

Bill Kirkwood, *Monterey Bay Aquarium Research Institute, USA*

Kent Headley, *Monterey Bay Aquarium Research Institute, USA*

Peter Brewer, *Monterey Bay Aquarium Research Institute, USA*

Edward Peltzer, *Monterey Bay Aquarium Research Institute, USA*



Thomas Miard, *University of Queensland, Australia*
Aaron Chai, *University of Queensland, Australia*
Mark James, *University of Queensland, Australia*
Kenneth Schneider, *Carnegie Institution, Department of Global Ecology, USA*
Jack Silverman, *Israel Oceanographic & Limnological Research Ltd*
Ken Caldeira, *Carnegie Institution, Department of Global Ecology, USA*
Stephen Monismith, *Stanford University, USA*
Brad Opdyke, *Australian National University*
Rob Dunbar, *Stanford University, USA*
Ray White, *University of Queensland, Australia*
Sophie Dove, *Centre for Marine Studies, University of Queensland, Australia*
Ove Hoegh-Guldberg, *Centre for Marine Studies, University of Queensland, Australia*

The Nazare Canyon (W Portugal) Observatory - Real Time Monitoring Of A Large Submarine Canyon.

Ines Martins, *Instituto Hidrografico, Portugal*
Joao Vitorino, *Instituto Hidrografico, Portugal*
Sara Almeida, *Instituto Hidrografico, Portugal*

Design Of A Prototype Tsunami Warning And Early Response System For Cyprus - TWERC

Georgios Georgiou, *University of Cyprus*
Andrew Clark, *CSnet International, Inc., USA*
George Zodiatis, *University of Cyprus*
Daniel Hayes, *University of Cyprus*
Dimitris Glekas, *CSnet CYPRUS Ltd., Cyprus*

Student poster oral presentation 3

Bayside 107

Wednesday, May 26 (8:30AM - 10:15AM)

Co-Chairs: **Stefan Williams**, *University of Sydney*
Norm Miller, *IEEE/OES*

Precise Sound Source Localisation Of Dolphin Biosonar Pulse Transmissions

Eric Ferguson, *University of Sydney, Australia*



Effects Of Climate Change And Anthropogenic Ocean Acidification On Underwater Acoustic Communications

Anuj Sehgal, *Jacobs University, Germany*

Iyad Tumar, *Jacobs University, Germany*

Jürgen Schönwälder, *Jacobs University, Germany*

Mapping Marine Phytoplankton Assemblages From A Hyperspectral And Artificial Intelligence Perspective

Elena Torrecilla, *Marine Technology Unit, Centre Mediterrani d'Investigacions Marines i Ambientals, Spain*

Sergi Pons, *Marine Technology Unit, Centre Mediterrani d'Investigacions Marines i Ambientals, Spain*

Albert Vilamala, *Artificial Intelligence Research Institute, Spanish Council for Scientific Research*

Ismael F. Aymerich, *Marine Technology Unit, Centre Mediterrani d'Investigacions Marines i Ambientals, Spain*

Josep Arcos, *Artificial Intelligence Research Institute, Spanish Council for Scientific Research*

Enric Plaza, *Artificial Intelligence Research Institute, Spanish Council for Scientific Research*

Jaume Pera, *Marine Technology Unit, Centre Mediterrani d'Investigacions Marines i Ambientals, Spain*

Water Profile Navigation With An Acoustic Doppler Current Profiler

Michael Stanway, *Massachusetts Institute of Technology / Woods Hole Oceanographic Institution Joint Program, USA*

Calibration Of Optical Camera Coupled To Acoustic Multibeam For Underwater 3D Scene Reconstruction

Natàlia Hurtós, *Universitat de Girona, Spain*

Xavier Cufí, *Universitat de Girona, Spain*

Joaquim Salvi, *Universitat de Girona, Spain*

The Role Of Carbonic Anhydrase Enzyme In The Biocalcification Process Of Coral And Its Resilience To Global Climate Change

M. Azizur Rahman, *University of the Ryukyus, Japan*

Tamotsu Oomori, *University of the Ryukyus, Japan*

Control System Performance And Efficiency For A Mid-Depth Lagrangian Profiling Float

Bryan McGilvray, *University of Rhode Island, USA*



Christopher Roman, *University of Rhode Island, USA*

WEDNESDAY 10:45AM – 12:30PM

Oceanography 1

Bayside 101

Wednesday, May 26 (10:45AM - 12:30PM)

Co-Chairs: **Paulo de Souza**, *Tasmanian Information & Communication Technologies Centre, Australia*

Nobuyoshi Kouguchi, *Kobe University, Graduate School of Maritime Sciences, Japan*

Wave Remote Sensing System By GPS

Nobuyoshi Kouguchi, *Kobe University, Graduate School of Maritime Sciences, Japan*

Jian CUI, *Kobe University, Graduate School of Maritime Sciences, Japan*

Akihiro IKAWA, *Kobe University, Graduate School of Maritime Sciences, Japan*

Shigeyuki OKUDA, *Kobe Marine Technical College, Japan*

Yasuo ARAI, *Kobe Marine Technical College, Japan*

Waves In The Southern Great Barrier Reef

Jasmine Jaffrés, *Marine Geophysical Laboratory, James Cook University, Australia*

Malcolm Heron, *Marine Geophysical Laboratory, James Cook University, Australia*

Andrew Middleditch, *Seaview Sensing Ltd, UK*

Craig Steinberg, *Australian Institute of Marine Science*

Tom Durrant, *Australian Bureau of Meteorology*

What Is Driving The Fast Warming Rate Of The Southern Hemisphere Midlatitude Ocean?

Timothy Cowan, *CSIRO Marine & Atmospheric Research, Australia*

Wenju Cai, *CSIRO Marine & Atmospheric Research, Australia*

Susan Wijffels, *CSIRO Wealth from Oceans Flagship, Australia*

Stuart Godfrey, *CSIRO Marine & Atmospheric Research, Australia*



**Statistical Clustering Of Curves In The Geosciences -
The Answer To Everything?**

Les Hamilton, *Defence Science & Technology Organisation,
Australia*

**Characterization Of Suspended Particles Collected
From An Estuary In An Urban And Industrialised
Centre Using Magnets Onboard An Autonomous
Underwater Vehicle**

Paulo de Souza, *Tasmanian Information & Communication
Technologies Centre, Australia*

Edward Butler, *CSIRO Wealth from Oceans Flagship,
Australia*

Andrew Davie, *Tasmanian Information & Communication
Technologies Centre, Australia*

Greg Timms, *Tasmanian Information & Communication
Technologies Centre, Australia*

Vijayendra Garg, *Instituto de Fisica, Universidade de
Brasilia, Brazil*

Underwater communications 3

Bayside 102

Wednesday, May 26 (10:45AM - 12:30PM)

Chair: **Milica Stojanovic**, *Northeastern
University, USA*

**Estimation And Compensation Of Doppler Effect In
UAC OFDM Systems**

Sadia Ahmed, *University of South Florida, USA*

Huseyin Arslan, *University of South Florida, USA*

**Capacity Of Underwater Acoustic OFDM Cellular
Networks**

Balakrishnan Srinivasan, *University of California Santa
Barbara, USA*

Volkan Rodoplu, *University of California Santa Barbara,
USA*

**Alamouti Space Time Coded OFDM For Underwater
Acoustic Channels**

Baosheng Li, *Northeastern University, USA*

Milica Stojanovic, *Northeastern University, USA*



**Progressive Inter-Carrier Interference Equalization
For OFDM Transmission Over Time-Varying
Underwater Acoustic Channels**

Jianzhong Huang, *University of Connecticut, USA*

Shengli Zhou, *University of Connecticut, USA*

Jie Huang, *University of Connecticut, USA*

Christian Berger, *Carnegie Mellon University, USA*

Petter Willett, *University of Connecticut, USA*

**Comparison Of Basis Pursuit Algorithms For Sparse
Channel Estimation In Underwater Acoustic OFDM**

Jianzhong Huang, *University of Connecticut, USA*

Christian Berger, *Carnegie Mellon University, USA*

Shengli Zhou, *University of Connecticut, USA*

Jie Huang, *University of Connecticut, USA*

**Advances in underwater imaging and mapping
Bayside 103**

Wednesday, May 26 (10:45AM - 12:30PM)

Chair: Marc Pinto, NURC

**Preliminary Investigations Using A Helicopter Time-
Domain System For Bathymetric Measurements And
Depth-To-Bedrock Estimation In Shallow Coastal
Waters - A Case Study In Broken Bay, Australia**

Julian Vrbancich, *Defence Science & Technology
Organisation, Australia*

**Overview Of Australian R & D For Acoustic Mine
Imaging**

Ronald Wyber, *Midspar Systems, Australia*

**Interferometric Synthetic Aperture Sonar In
Pipeline Inspection**

Roy Hansen, *Norwegian Defence Research Establishment*

Torstein Sabo, *Norwegian Defence Research
Establishment*

Per Hagen, *Kongsberg Maritime, Norway*

Hayden Callow, *Norwegian Defence Research
Establishment*



**Autonomous Detection And Volume Determination
Of Tubeworm Colonies From Underwater Robotic
Surveys**

Toshihiro Maki, *University of Tokyo, Japan*

Ayaka Kume, *University of Tokyo, Japan*

Tamaki Ura, *University of Tokyo, Japan*

Takashi Sakamaki, *University of Tokyo, Japan*

Hideyuki Suzuki, *University of Tokyo, Japan*

**Development Of A Landing Algorithm For
Autonomous Underwater Vehicles Using Laser
Profiling**

Mehul Sangekar, *Underwater Robotics & Application
Laboratory, University of Tokyo, Japan*

Blair Thornton, *Underwater Robotics & Application
Laboratory, University of Tokyo, Japan*

Tamaki Ura, *Underwater Robotics & Application
Laboratory, University of Tokyo, Japan*

Takeshi Nakatani, *Underwater Robotics & Application
Laboratory, University of Tokyo, Japan*

Vehicle navigation 2

Bayside 104

Wednesday, May 26 (10:45AM - 12:30PM)

Co-Chairs: **Jenhwa Guo**, *Department of Engineering
Science and Ocean Engineering, National
Taiwan University*

Hsin-Hung Chen, *National Sun Yat-sen
University, Taiwan*

**Study On Underwater Terrain Matching Positioning
Based On The Integration Of TERCOM And MCTM**

Jianhu Zhao, *School of Geodesy and Geomatics, Wuhan
University, China*

Kai Zhang, *School of Geodesy and Geomatics, Wuhan
University, China*

Hongmei Zhang, *School of Geodesy and Geomatics,
Wuhan University, China*

Kun Yang, *Tianjin Research Institute For Water Transport
Engineering, China*

**Deep-Sea AUV Navigation Using Side-Scan Sonar
Images And SLAM**

Philipp Woock, *Fraunhofer Institute of Optronics, System*



Technologies and Image Exploitation, Germany

*Christian Frey, Fraunhofer Institute of Optronics, System
Technologies and Image Exploitation, Germany*

**Study On The Underwater Geomagnetic Navigation
Based On The Integration Of TERCOM And K-Means
Clustering Algorithm**

*Shengping wang, School of Geodesy and Geomatics,
Wuhan University, China*

*Hongmei Zhang, School of Power and Mechanical
Engineering, Wuhan University, China*

*Kun Yang, Tianjin Research Institute For Water Transport
Engineering, China*

*Chunhe Tian, Tianjin Research Institute For Water
Transport Engineering, China*

**Seabed Topographic Contour Match Based On Angle
Code Technique**

*Hongmei Zhang, Automation Department, Wuhan
University, China*

*Jianhu Zhao, School of Geodesy and Geomatics, Wuhan
University, China*

*Kun Yang, Tianjin Research Institute For Water Transport
Engineering, China*

*Chunhe Tian, Tianjin Research Institute For Water
Transport Engineering, China*

**Map Uncertainties For Unmanned Underwater
Vehicle Navigation Using Sidescan Sonar**

*Jenhwa Guo, Department of Engineering Science and
Ocean Engineering, National Taiwan University*

*WH Wang, Department of Engineering Science and Ocean
Engineering, National Taiwan University*

SW Huang, Taiwan Ocean Research Institute

Edward Chen, Taiwan Ocean Research Institute

*FC Chiu, Department of Engineering Science and Ocean
Engineering, National Taiwan University*



Remotely operated vehicles

Bayside 105

Wednesday, May 26 (10:45AM - 12:30PM)

Co-Chairs: **Shinichi Takagawa**, *Institute of Industrial Science, University of Tokyo, Japan*

Tomoya Inoue, *Japan Agency for Marine-Earth Science and Technology*

Flipper Type Crawler System For Running On The Irregular Seafloor

Tomoya Inoue, *Japan Agency for Marine-Earth Science and Technology*

Takuya Shiosawa, *Japan Agency for Marine-Earth Science and Technology / University of Tokyo*

Ken Takagi, *Japan Agency for Marine-Earth Science and Technology / University of Tokyo*

Development Of A Human-Sized ROV With Dual-Arm

Norimitsu Sakagami, *Tokai University, Japan*

Mizuho Shibata, *Ritsumeikan university, Kyoto, Japan*

Yuuta Hagiwara, *Ritsumeikan university, Kyoto, Japan*

Kouhei Ishimaru, *Ritsumeikan university, Kyoto, Japan*

Tomohiro Ueda, *Ritsumeikan university, Kyoto, Japan*

Takayuki Saito, *Ritsumeikan university, Kyoto, Japan*

Kazuhiro Fujita, *Ritsumeikan university, Kyoto, Japan*

Hideki Hashizume, *Ritsumeikan university, Kyoto, Japan*

Toshifumi Inoue, *Dainippon Screen Manufacturing, Japan*

Shigeo Murakami, *Dainippon Screen Manufacturing, Japan*

Hiroyuki Onishi, *Dainippon Screen Manufacturing, Japan*

Sadao Kawamura, *Ritsumeikan university, Kyoto, Japan*

A New Concept Design Of Heave Compensation System For Longer Life Of Cables

Shinichi Takagawa, *Institute of Industrial Science, University of Tokyo, Japan*

Deep Water ROV Design For The Mexican Oil Industry

Tomas Salgado-Jimenez, *Center for Engineering and Industrial Development (CIDESI), Mexico*

Jose Luis Gonzalez-Lopez, *Center for Engineering and Industrial Development (CIDESI), Mexico*



Luis Martinez-Soto, *Center for Engineering and Industrial Development (CIDESI), Mexico*

Edgar Olguin Lopez, *Center for Engineering and Industrial Development (CIDESI), Mexico*

Pedro Resendiz Gonzalez, *Center for Engineering and Industrial Development (CIDESI), Mexico*

Manuel Bandala-Sanchez, *Center for Engineering and Industrial Development (CIDESI), Mexico*

Classification and pattern recognition

Bayside 106

Wednesday, May 26 (10:45AM - 12:30PM)

Chair: Phil Chapple, *DSTO*

False-Alarm Reduction In Mine Classification Using Multiple Looks From A Synthetic Aperture Sonar

Johannes Groen, *NATO Undersea Research Centre*

David Williams, *NATO Undersea Research Centre*

Enrique Coiras, *NATO Undersea Research Centre*

Detection Of Buried And Partially Buried Objects Using A Bio-Inspired Wideband Sonar

Chris Capus, *Heriot-Watt University, UK*

Yan Pailhas, *Heriot-Watt University, UK*

Keith Brown, *Heriot-Watt University, UK*

David Lane, *Heriot-Watt University, UK*

Featureless Classification For Active Sonar Systems

Mary Soules, *Johns Hopkins University Applied Physics Laboratory, USA*

Joshua Broadwater, *Johns Hopkins University Applied Physics Laboratory, USA*

Towards Generalized Benthic Species Recognition And Quantification Using Computer Vision

Adam Gobi, *Memorial University of Newfoundland, Canada*



WEDNESDAY 1:30PM – 3:15PM

Hydrography / seafloor mapping / geodesy

Bayside 101

Wednesday, May 26 (1:30PM - 3:15PM)

Co-Chairs: **Magnus Wettle**, *Geoscience Australia*

Jianhu Zhao, *School of Geodesy and
Geomatics, Wuhan University, China*

**Mapping The Fine-Scale Shallow Water Bathymetry
Of The Great Barrier Reef Using ALOS AVNIR-2 Data**

Stephen Sagar, *Geoscience Australia*

Magnus Wettle, *Geoscience Australia*

**Mapping The Coastal Bathymetry With FORMOSAT-2
Image**

Shih-Jen Huang, *Department of Marine Environmental
Informatics, National Taiwan Ocean University*

Nan-Jung Kuo, *Department of Marine Environmental
Informatics, National Taiwan Ocean University*

Chung-Ru Ho, *Department of Marine Environmental
Informatics, National Taiwan Ocean University*

Cheng-Han Tsai, *Department of Marine Environmental
Informatics, National Taiwan Ocean University*

Hsien-Wen Li, *Department of Civil Engineering and
Environmental Informatics, Minghsin University of Science
and Technology, Taiwan*

Yao-Tsai Lo, *Department of Marine Environmental
Informatics, National Taiwan Ocean University*

Dong-Jiing Doong, *Department of Marine Environmental
Informatics, National Taiwan Ocean University*

Hung-Jen Lee, *Department of Marine Environmental
Informatics, National Taiwan Ocean University*

Young-Zehr Kehr, *Department of Systems Engineering
and Naval Architecture, National Taiwan Ocean University*

**Evaluation Of An Off-The-Shelf Acoustic System For
Precision Positioning Of Seabed Transponders**

Hsin-Hung Chen, *National Sun Yat-sen University, Taiwan*

Chau-Chang Wang, *National Sun Yat-sen University,
Taiwan*

Jia-Pu Jang, *Taiwan Ocean Research Institute*



Software Development For The Determination And Transfer Of Chart Datum

Jianhu Zhao, *School of Geodesy and Geomatics, Wuhan University, China*

Hao Ke, *School of Geodesy and Geomatics, Wuhan University, China*

Baohua Xu, *Survey Bureau of Hydrology and Water Resources of Changjiang Estuary, China*

Fengnian Zhou, *Survey Bureau of Hydrology and Water Resources of Changjiang Estuary, China*

Sonar signal processing 2

Bayside 102

Wednesday, May 26 (1:30PM - 3:15PM)

Chair: Peter Gough, *Acoustics Research Group, University of Canterbury, New Zealand*

Localisation And Tracking Of Underwater Acoustic Source Using A Modified Particle Filter

Dragana Carevic, *Defence Science & Technology Organisation, Australia*

Underwater Acoustic Sensor Localization Using A Broadband Sound Source In Uniform Linear Motion

Kam Lo, *Defence Science & Technology Organisation, Australia*

Brian Ferguson, *Defence Science & Technology Organisation, Australia*

Comparing Of LPC-EKF, LPC-UKF In UUV Bearings-Only Tracking Systems

Jin Xu, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Shenzhen Ren, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Xisheng Feng, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Changlong Lin, *Shenyang Institute of Automation, Chinese Academy of Sciences*

A Sweeper Scheme For Localization And Mobility Prediction In Under Water Acoustic Sensor Networks

Dharan Kuppusamy, *Vellore Institute of Technology, India*



Soo Park, *Kookmin University, South Korea*

Srimathi Chandhrasekaran, *Vellore Institute of Technology, India*

Passive Localization Of An Autonomous Underwater Vehicle With Periodic Sonar Signaling

Zhiguo Yang, *Zhejiang University, China*

Wen Xu, *Zhejiang University, China*

Zhuan Xiao, *Zhejiang University, China*

Xiang Pan, *Zhejiang University, China*

**Advances in integrated marine observing systems 2
Bayside 103**

Wednesday, May 26 (1:30PM - 3:15PM)

Chair: Simon Allen, *University of Tasmania*

The Australian IMOS Southern Ocean Time Series Facility

Thomas Trull, *Antarctic Climate & Ecosystems Cooperative Research Centre, Australia*

Eric Schulz, *Australian Bureau of Meteorology*

Stephen Bray, *Antarctic Climate & Ecosystems Cooperative Research Centre, Australia*

Lindsay Pender, *CSIRO Marine & Atmospheric Research, Australia*

Danny McLaughlan, *CSIRO Marine & Atmospheric Research, Australia*

Bronte Tilbrook, *CSIRO Marine & Atmospheric Research, Australia*

Mark Rosenberg, *Antarctic Climate & Ecosystems Cooperative Research Centre, Australia*

Tim Lynch, *CSIRO Marine & Atmospheric Research, Australia*

The Lucinda Jetty Coastal Observatory's Role In Satellite Ocean Colour Calibration And Validation For Great Barrier Reef Coastal Waters.

Vittorio Brando, *CSIRO Land & Water, Australia*

Rex Keen, *CSIRO Land & Water, Australia*

Paul Daniel, *CSIRO Land & Water, Australia*

Adam Baumeister, *CSIRO Land & Water, Australia*

Matt Nethery, *CSIRO Land & Water, Australia*

Henry Baumeister, *CSIRO Land & Water, Australia*



Aaron Hawdon, *CSIRO Land & Water, Australia*
Garry Swan, *CSIRO Land & Water, Australia*
Ross Mitchell, *CSIRO Marine & Atmospheric Research, Australia*
Susan Campbell, *CSIRO Marine & Atmospheric Research, Australia*
Thomas Schroeder, *CSIRO Land & Water, Australia*
Young Park, *CSIRO Land & Water, Australia*
Rebecca Edwards, *CSIRO Land & Water, Australia*
Andy Steven, *CSIRO Land & Water, Australia*
Simon Allen, *CSIRO Marine & Atmospheric Research, Australia*
Lesley Clementson, *CSIRO Marine & Atmospheric Research, Australia*
Arnold Dekker, *CSIRO Land & Water, Australia*

The Wave Glider, A Persistent Platform For Ocean Science

Justin Manley, *Liquid Robotics, USA*
Scott Willcox, *Liquid Robotics, USA*

Sustained Oceanographic Observations Around Australia Using Autonomous Ocean Gliders

Ben Hollings, *University of Western Australia*
Charitha Pattiaratchi, *University of Western Australia*
Mun Woo, *University of Western Australia*
Christine Hanson, *University of Western Australia*

Bright Blue: Advanced Technologies For Marine Environmental Monitoring And Offshore Energy

Richard Camilli, *Woods Hole Oceanographic Institution, USA*
Andrew Bowen, *Woods Hole Oceanographic Institution, USA*
Norman Farr, *Woods Hole Oceanographic Institution, USA*



Vehicle design 1

Bayside 104

Wednesday, May 26 (1:30PM - 3:15PM)

Co-Chairs: **Hayato Kondo**, *Tokyo University of Marine Science and Technology, Japan*

Yun Hae Kim, *Korea Maritime University*

Material Design Of Al/CFRP Hybrid Composites For The Hull Of Autonomous Underwater Vehicle

Yun Hae Kim, *Korea Maritime University*

Young dae Jo, *Korea Maritime University*

Sung youl Bae, *Korean Register of Shipping*

Seokjin Sin, *Korea Maritime University*

Kyung man Moon, *Korea Maritime University*

Min Jung Kim, *Korea Maritime University*

New Ceramic Pressure Hull Design For Deep Water Applications

Shinichi Takagawa, *Institute of Industrial Science, University of Tokyo, Japan*

Hull Form Design Of Underwater Vehicle Applying CFD

Tomoya Inoue, *Japan Agency for Marine-Earth Science and Technology*

Hiroyoshi Suzuki, *Osaka University, Japan*

Risa Kitamoto, *Osaka University, Japan*

Yoshitaka Watanabe, *Japan Agency for Marine-Earth Science and Technology*

Hiroshi Yoshida, *Japan Agency for Marine-Earth Science and Technology*

Pressure Tolerant Systems For Deep Sea Applications

Martin Lueck, *Department for Electromechanical and Optical Systems, Technical University Berlin, Germany*

Moritz Buscher, *Department for Electromechanical and Optical Systems, Technical University Berlin, Germany*

Heinz Lehr, *Department for Electromechanical and Optical Systems, Technical University Berlin, Germany*

Carl Thiede, *ENITECH Energietechnik-Elektronik GmbH, Germany*

Gerhard Körner, *ENITECH Energietechnik-Elektronik*



GmbH

Jochen Martin, *ENITECH Energietechnik-Elektronik GmbH*

Marion Schlichting, *ENITECH Energietechnik-Elektronik GmbH*

Siegfried Krüger, *Leibniz Institut for Baltic Sea Research Warnemünde, Germany*

Hartmut Huth, *Leibniz Institut for Baltic Sea Research Warnemünde, Germany*

Autonomic Element Based Architecture For Unmanned Underwater Vehicles

Changlong Lin, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Shenzhen Ren, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Xisheng Feng, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Yiping Li, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Jinbao Xu, *Shenyang Institute of Automation, Chinese Academy of Sciences*

Signal coherence and fluctuation

Bayside 105

Wednesday, May 26 (1:30PM - 3:15PM)

Chair: **Adrian Jones**, *Defence Science & Technology Organisation, Australia*

Experimental Study Of The Space-Time Properties Of Acoustic Channels For Underwater Communications

Beatrice Tomasi, *University of Padova, Italy*

Giovanni Zappa, *NATO Undersea Research Centre*

Kim McCoy, *NATO Undersea Research Centre*

Paolo Casari, *University of Padova, Italy*

Michele Zorzi, *University of Padova, Italy*

Temporal Variation Of The Statistical Properties Of An Underwater Acoustic Channel Measured At A Shallow Water In 2009

Sea-Moon Kim, *Maritime & Ocean Engineering Research Institute / Korea Ocean Research & Development Institute*

Sung-Hoon Byun, *Maritime & Ocean Engineering Research Institute / Korea Ocean Research & Development Institute*

Seung-Geun Kim, *Maritime & Ocean Engineering Research*



Institute / Korea Ocean Research & Development Institute
Yong-Kon Lim, Maritime & Ocean Engineering Research
Institute / Korea Ocean Research & Development Institute

The High Frequency Underwater Acoustic Channel

Craig Benson, University of New South Wales, Australia

Timothy Hajenko, University of New South Wales,
Australia

**Improving Resolution And SNR Of Correlation
Function With The Increase In Bandwidth Of
Recorded Noise Fields During Estimation Of Bottom
Profile Of Ocean**

Md Jahangir Alam, Australian Defence Force Academy

Michael Frater, Australian Defence Force Academy

Elanor Huntington, Australian Defence Force Academy

**Marine optics technology and instrumentation
Bayside 106**

Wednesday, May 26 (1:30PM - 3:15PM)

Co-Chairs: *John Watson, University of Aberdeen*

**David Farrant, CSIRO Materials Science &
Engineering, Australia**

**Automated Three-Dimensional Measurement Method
Of In Situ Fish With A Stereo Camera**

Jun Han, University of Tokyo, Japan

Akira Asada, University of Tokyo, Japan

*Hideyuki Takahashi, National Research Institute of
Fisheries Engineering, Japan*

*Kouichi Sawada, National Research Institute of Fisheries
Engineering, Japan*

**A Combined Acoustic And Optical Instrument For
Fisheries Studies**

Matthew Sherlock, CSIRO Marine & Atmospheric Research,
Australia

Tim Ryan, CSIRO Marine & Atmospheric Research,
Australia

Rudy Kloser, CSIRO Marine & Atmospheric Research,
Australia



**The Low Distortion All-Around View System Using
The Fisheye Lens For An Underwater Vehicle**

Shojiro Ishibashi, *Japan Agency for Marine-Earth Science
and Technology*

**Evaluation Of Using A CCD Camera As A
Measurement System For Flume Tank Observation**

Chau-Chang Wang, *Institute of Applied Marine Physics and
Undersea Technology, National Sun Yat-sen University,
Taiwan*

Po-Chi Chen, *Taiwan Ocean Research Institute*

Hsin-Hung Chen, *Institute of Applied Marine Physics and
Undersea Technology, National Sun Yat-sen University,
Taiwan*

Wen-Li Chang, *Institute of Applied Marine Physics and
Undersea Technology, National Sun Yat-sen University,
Taiwan*

Ocean energy and offshore structures

Bayside 107

Wednesday, May 26 (1:30PM - 3:15PM)

Co-Chairs: **David Griffin**, *CSIRO Wealth from Oceans
Flagship, Australia*

Evan Zimmerman, *Delmar, USA*

**Ocean Power For Australia - Waves, Tides And
Ocean Currents**

David Griffin, *CSIRO Wealth from Oceans Flagship,
Australia*

Mark Hemer, *CSIRO Wealth from Oceans Flagship,
Australia*

**A Preliminary Analysis Of The Effect Of The Onset
Flow Structure On Tidal Turbine Blade Loads**

Ian Milne, *University of Auckland, New Zealand*

Rajnish Sharma, *University of Auckland, New Zealand*

Richard Flay, *University of Auckland, New Zealand*

Simon Bickerton, *University of Auckland, New Zealand*

**Progress In The Development Of A Multi-Mode Self-
Reacting Wave Energy Converter**

Lan Le-Ngoc, *Industrial Research Ltd, New Zealand*

Alister Gardiner, *Industrial Research Ltd, New Zealand*



Robert Stuart, *Industrial Research Ltd, New Zealand*
Alan Caughley, *Industrial Research Ltd, New Zealand*
John Huckerby, *Power Projects Ltd, New Zealand*

**Risk Management Of Moored Mobile Offshore
Drilling Units In The Western Pacific Ocean**

Evan Zimmerman, *Delmar, USA*
Daniel Alonso, *Delmar, USA*

WEDNESDAY 3.45PM – 5:30PM

Oceanography 2

Bayside 101

Wednesday, May 26 (3:45PM - 5:30PM)

Co-Chairs: **Damian Ogburn**, *URS Australia*
Sirod Sirisup, *National Electronics and
Computer Technology Center, Thailand*

**Coastal Ocean Simulation Of The Gulf Of Thailand: A
Case Study Of Finite Volume Coastal Ocean Model**

Saifhon Tomkratoke, *National Electronics and Computer
Technology Center, Thailand*
Sirod Sirisup, *National Electronics and Computer
Technology Center, Thailand*

**Modeling Of Turbulence Prandtl Number In
Stationary And Homogeneous Stratified Turbulence**

Shinichiro Hirabayashi, *University of Tokyo, Japan*
Toru Sato, *University of Tokyo, Japan*

**Case Study Of Phytoplankton Blooms In Serangoon
Harbor Of Singapore**

Nicholas Patrikalakis, *Massachusetts Institute of
Technology, USA*
Paola Malanotte-Rizzoli, *Massachusetts Institute of
Technology, USA*
Pavel Tkachik, *National University of Singapore*
Wonjoon Cho, *Massachusetts Institute of Technology, USA*
Boon Hooi Ooi, *Singapore - MIT Alliance for Research and
Technology*
Haining Zheng, *Massachusetts Institute of Technology,
USA*
Kevin Yue, *Massachusetts Institute of Technology, USA*



Hanna Kurniawati, *Singapore - MIT Alliance for Research and Technology*

Palani Sundarambal, *Tropical Marine Science Institute, National University of Singapore*

My Ha Dao, *Tropical Marine Science Institute, National University of Singapore*

Roopsekhar Karanam, *Tropical Marine Science Institute, National University of Singapore*

Jun Wei, *Massachusetts Institute of Technology, USA*

Modeling Of The Climate And Anthropogenic Influences To The Eutro-Dynamics In Dapen Bay, Taiwan

Chia-Shun Yu, *National Sun Yat-sen University, Taiwan*

Pei-Hung Chen, *National Sun Yat-sen University, Taiwan*

Hau-Chen Yu, *National Sun Yat-sen University, Taiwan*

Mapping The Fish Fry Feeding Prism In A Saltmarsh-Estuary Ecotone

Damian Ogburn, *URS Australia*

Thomas Zeng, *Sydney University, Australia*

Underwater communications 4

Bayside 102

Wednesday, May 26 (3:45PM - 5:30PM)

Co-Chairs: **Craig Benson**, *University of New South Wales, Australia*

Shengli Zhou, *University of Connecticut*

On The Effects Of Node Density And Duty Cycle On Energy Efficiency In Underwater Networks

Francesco Zorzi, *University of Padova, Italy*

Milica Stojanovic, *Northeastern University, USA*

Michele Zorzi, *University of Padova, Italy*

Optimizing Network Performance Through Packet Fragmentation In Multi-Hop Underwater Communications

Roberto Petrocchia, *La Sapienza, University of Rome, Italy*

Milica Stojanovic, *Northeastern University, USA*

Stefano Basagni, *Northeastern University, USA*

Chiara Petrioli, *La Sapienza, University of Rome, Italy*



COPE-MAC: A Contention-Based Medium Access Control Protocol With Parallel Reservation For Underwater Acoustic Networks

Zheng Peng, *University of Connecticut, USA*

Yibo Zhu, *University of Connecticut, USA*

Zhong Zhou, *University of Connecticut, USA*

Zheng Guo, *University of Connecticut, USA*

Jun-Hong Cui, *University of Connecticut, USA*

A Cooperative ARQ Scheme In Underwater Acoustic Sensor Networks

Ho-Shin Cho, *Kyungpook National University, Korea*

Jae Won Lee, *Kyungpook National University, Korea*

Jin Yong Cheon, *Kyungpook National University, Korea*

Opportunistic ARQ With Bidirectional Overhearing For Reliable Multihop Underwater Networking

Haojie Zhuang, *Institute for Infocomm Research, Agency for Science, Technology & Research (A*STAR), Singapore*

Hwee-Pink Tan, *Institute for Infocomm Research, Agency for Science, Technology & Research (A*STAR), Singapore*

Alvin Valera, *Institute for Infocomm Research, Agency for Science, Technology & Research (A*STAR), Singapore*

Zijian Bai, *Institute for Infocomm Research, Agency for Science, Technology & Research (A*STAR), Singapore*

Bioacoustics

Bayside 103

Wednesday, May 26 (3:45PM - 5:30PM)

Chair: **Douglas Cato**, *Defence Science & Technology Organisation / University of Sydney, Australia*

Classification Of A Large Collection Of Indo-Pacific Humpback Dolphin (*Sousa chinensis*) Whistles

Paul Seekings, *Marine Mammal Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Kian Yeo, *Marine Mammal Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Paul Chen, *Marine Mammal Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Suranga Nanayakkara, *Marine Mammal Research Laboratory, Tropical Marine Science Institute, National University of Singapore*



Jolyn Tan, *Marine Mammal Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Petrina Tay, *Marine Mammal Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Elizabeth Taylor, *Marine Mammal Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Automatic Discrimination Of Beaked Whale Clicks In Long Noisy Acoustic Time Series

Les Hamilton, *Defence Science & Technology Organisation, Australia*

Jane Cleary, *Defence Science & Technology Organisation, Australia*

Modelling Backscatter Of Marine Mammal Bio-Mimetic Sonar Signals From Bubble Clouds

Kian Yeo, *Tropical Marine Science Institute, National University of Singapore*

Elizabeth Taylor, *Tropical Marine Science Institute, National University of Singapore*

S Ong, *National University of Singapore*

Long-Term Real-Time Monitoring Of Free-Ranging Bottlenose Dolphins (*Tursiops truncatus*) In An Aquarium Using 5-Hydrophone Array System

Harumi Sugimatsu, *Institute of Industrial Science, University of Tokyo*

Tamaki Ura, *Institute of Industrial Science, University of Tokyo*

Junichi Kojima, *KDDI R&D Laboratories Inc., Japan*

hiroshi Shimura, *Izu Mito Sea Paradise Co., Ltd., Japan*

Kenji Maejima, *Izu Mito Sea Paradise Co., Ltd., Japan*

Koichi Kato, *Izu Mito Sea Paradise Co., Ltd., Japan*

Yuki Tahara, *Izu Mito Sea Paradise Co., Ltd., Japan*

Ayako Takahashi, *Izu Mito Sea Paradise Co., Ltd., Japan*

Shizuko Hiryu, *Doshisha University, Japan*

Emyo Fujioka, *Doshisha University, Japan*

Yoshiaki Watanabe, *Doshisha University, Japan*



Collaborative autonomous vehicles 1

Bayside 104

Wednesday, May 26 (3:45PM - 5:30PM)

Co-Chairs: **David Lane**, *SeeByte Ltd, UK*

Michael Jakuba, *Australian Centre for Field Robotics, University of Sydney, Australia*

Collaborative Multi-Vehicle Localization And Mapping In Marine Environments

Diluka Moratuwage, *Nanyang Technological University, Singapore*

Wijerupage Wijesoma, *Nanyang Technological University, Singapore*

Bharath Kalyan, *Nanyang Technological University, Singapore*

Jun Dong, *Nanyang Technological University, Singapore*

P.G. Chaminda Senarathne, *Nanyang Technological University, Singapore*

Franz Hover, *Massachusetts Institute of Technology, USA*

Nicholas Patrikalakis, *Massachusetts Institute of Technology, USA*

Event-Based Motion Coordination Of Multiple Underwater Vehicles Under Disturbances

Pedro Teixeira, *Underwater Systems and Technologies Laboratory, Faculty of Engineering, University of Porto, Portugal*

Dimos Dimarogonas, *Massachusetts Institute of Technology, USA*

Karl Johansson, *Royal Institute of Technology, Sweden*

João Sousa, *Underwater Systems and Technologies Laboratory, Faculty of Engineering, University of Porto, Portugal*

Multi-AUV Coordination In The Underwater Environment With Obstacles

Yan Yang, *Tianjin University, China*

Shuxin Wang, *Tianjin University, China*

Zhiliang Wu, *Tianjin University, China*

Collision Free Formation Control For Multiple Autonomous Underwater Vehicles

Shibo Fan, *State Key Laboratory of Ocean Engineering, Shanghai Jiao Tong University, China*



Zhengping FENG, *State Key Laboratory of Ocean Engineering, Shanghai Jiao Tong University, China*

Lian LIAN, *State Key Laboratory of Ocean Engineering, Shanghai Jiao Tong University, China*

A Low Cost Test Bed Of Underwater Mobile Sensing Network

Zhengping Feng, *Shanghai Jiao Tong University, China*

Guiyang Shang, *Shanghai Jiao Tong University, China*

Lian Lian, *Shanghai Jiao Tong University, China*

Automatic control

Bayside 105

Wednesday, May 26 (3:45PM - 5:30PM)

Co-Chairs: **Chau-Chang Wang**, *Institute of Applied Marine Physics and Undersea Technology, National Sun Yat-sen University, Taiwan*
Nuno Cruz, *Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal*

Auto-Heading Controllers For An Autonomous Sailboat

Nuno Cruz, *Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal*

José Alves, *Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal*

A Sub-Region Tracking Control For An Underwater Vehicle-Manipulator System With A Sub-Task Objective

Zool Ismail, *School of Engineering and Physical Sciences, Heriot-Watt University, UK*

Matthew Dunnigan, *School of Engineering and Physical Sciences, Heriot-Watt University, UK*

Trajectory Tracking For Marine Vehicles Under Constant Disturbances: Controller Design And Tuning

Mernout Burger, *Norwegian University of Science and Technology*

Kristin Pettersen, *Norwegian University of Science and Technology*



Depth Control Of An Autonomous Underwater Vehicle, STARFISH

You Hong Eng, *Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Geok Soon Hong, *National University of Singapore*

Mandar Chitre, *Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

A Dynamic Compensation Mechanism For Contactless Power Transfer Systems

Wei Gu, *Shanghai Jiao Tong University, China*

Wangqiang Niu, *Shanghai Jiao Tong University, China*

Jianxin Chu, *Shanghai Jiao Tong University, China*

Jianhua Wang, *Shanghai Jiao Tong University, China*

Sonar imaging

Bayside 106

Wednesday, May 26 (3:45PM - 5:30PM)

Co-Chairs: Roy Hansen, *Norwegian Defence Research Establishment*

Didier Gueriot, *Télécom Bretagne, France*

Forward Looking Sonar Data Simulation Through Tube Tracing

Didier Gueriot, *Télécom Bretagne, France*

Christophe SINTES, *Télécom Bretagne, France*

3D Reconstruction Of Underwater Scenes Using Image Sequences From Acoustic Camera

Naouraz Brahim, *Télécom Bretagne, France*

Didier Guériot, *Télécom Bretagne, France*

Sylvie Daniel, *Université Laval, Canada*

Study On The Fusion Of MBS Image And SSS Image

Hongmei Zhang, *Automation Department, Wuhan University, China*

Jianhu Zhao, *School of Geodesy and Geomatics, Wuhan University, China*

Kun Yang, *Tianjin Research Institute For Water Transport Engineering, China*



**Study On Side Scan Sonar Image Matching Based
On The Integration Of Surf And Similarity
Calculation Of Typical Areas**

Jianhu Zhao, *Wuhan University, China*

Weiliang Tao, *Wuhan University, China*

Hongmei Zhang, *Wuhan University, China*

Kun Yang, *Tianjin Research Institute For Water Transport
Engineering, China*

On Methods Of Multi-Beam Data Error Correction

Yongting Wu, *School of Geodesy and Geomatics, Wuhan
University / First Institute of Oceanography, State
Oceanic Administration, China*

Yinan Chen, *First Institute of Oceanography, State
Oceanic Administration, China*

Kun Yang, *Tianjin Research Institute For Water Transport
Engineering, China*

Jisheng Ding, *Tianjin Research Institute For Water
Transport Engineering, China*

Qihua Tang, *Tianjin Research Institute For Water
Transport Engineering, China*

Marine safety

Bayside 107

Wednesday, May 26 (3:45PM - 5:30PM)

Co-Chairs: Etsuro Shimizu, *Tokyo University of
Marine Science and Technology, Japan*

Eiichi Kobayashi, *Kobe University, Japan*

**Basic Study On Construction Of Visual Evaluation
System For Safety Ship Navigation**

Hiddenari Makino, *Kobe University, Japan*

Eiichi Kobayashi, *Kobe University, Japan*

Nobukazu Wakabayashi, *Kobe University, Japan*

Shigeaki Shiotani, *Kobe University, Japan*

**Navigator's Decision-Making And Action Model -
Synthetically Subjective Risk Of Collision**

Takashi Kubota, *Oshima National College of Maritime
Technology, Japan*

Nobuyoshi Kouguchi, *Faculty of Maritime Sciences, Kobe
University, Japan*



**Proposal Of New Generation Route Optimization
Technique For An Oceangoing Vessel**

Eriko Ishii, *Kobe University, Japan*

Eiichi KOBAYASHI , *Kobe University, Japan*

Takashi Mizunoe, *Kobe University, Japan*

Atsuo Maki, *Kobe University, Japan*

**Drift Track Simulations For Past Marine Incidents
Using SARMAP**

Tse-Nung Chu, *National Taiwan Ocean University*

Cheng-Hang Tsai, *National Taiwan Ocean University*

Field Observation On Actual Lightering Operations

Etsuro Shimizu, *Tokyo University of Marine Science and
Technology, Japan*

Egil Pedersen, *Norwegian University of Science and
Technology*

Yasunari Takano, *Tokyo University of Marine Science and
Technology, Japan*



Program Thursday 27 May

THURSDAY 8:30AM – 10:15AM

Naval architecture

Bayside 101

Thursday, May 27 (8:30AM - 10:15AM)

Co-Chairs: **Daniel Rolland**, *Alion Science and Technology, USA*

Shigeaki Shiotani, *Kobe University, Japan*

Measurement And Estimation Of Waves Generated By A Small Ship In Port

Shigeaki Shiotani, Kobe University, Japan

Hydrodynamic Forces And Moment Acting On A Submersible Surface Ship In Vertical Motion

Michio Ueno, National Maritime Research Institute, Japan

Yoshiaki Tsukada, National Maritime Research Institute, Japan

Hiroshi Sawada, National Maritime Research Institute, Japan

Reducing Bubble Sweepdown Effects On Research Vessels

Daniel Rolland, Alion Science and Technology, USA

Pamela Clark, Alion Science and Technology, USA

Propulsion System Considerations For Research Vessels

Daniel Rolland, Alion Science and Technology, USA

Pamela Clark, Alion Science and Technology, USA

Optimal Modeling Of Ship Moving

Inna Elyukhina, South Ural State University, Russia

Leonid Kholpanov, Institute of Problems of Chemical Physics, Russian Academy of Science

Albert Khomyakov, Krylov Shipbuilding Research Institute, Russia



Sonar signal processing 3

Bayside 102

Thursday, May 27 (8:30AM - 10:15AM)

Co-Chairs: Douglas Abraham, *CausaSci LLC, USA*

Christian de Moustier, *HLS Research, Inc., USA*

Uncertainty In Bearing Estimation With The Volume Search Sonar

Christian de Moustier, *HLS Research, Inc., USA*

Adaptive Motion-Compensated Temporal Filtering Of Sector Scan Sonar Image Sequences

Bin Shen, *Defence Science & Technology Organisation, Australia*

Stuart Perry, *Canon Information Systems Research Australia*

Donald Fraser, *Australian Defence Force Academy*

A Simulation Model Of The Pulse Echo Returns For A Short-Range SAS

Peter Gough, *Acoustics Research Group, University of Canterbury, New Zealand*

Michael HAYES, *Acoustics Research Group, University of Canterbury, New Zealand*

Simulation On Large Scale Of Acoustic Signals For Array Processing

Gerard Llort-Pujol, *Télécom Bretagne, France*

Christophe Sintès, *Télécom Bretagne, France*

Thierry Chonavel, *Télécom Bretagne, France*

Didier Guériot, *Télécom Bretagne, France*

René Garelo, *Télécom Bretagne, France*

K-Rayleigh Mixture Model For Sparse Active Sonar Clutter

Douglas Abraham, *CausaSci LLC, USA*

James Gelb, *Applied Research Laboratories, University of Texas, USA*

Andrew Oldag, *Applied Research Laboratories, University of Texas, USA*



**Advances in understanding of marine environments
in the Western Pacific 1**

Bayside 103

Thursday, May 27 (8:30AM - 10:15AM)

Co-Chairs: **Yusaku Kyojuka**, *Kyushu University, Japan*
Dong-Jiing Doong, *Department of Marine
Environmental Informatics, National Taiwan
Ocean University*

**Laboratory Verification On Waveform Inversion Of
An Internal Solitary Wave In The South China Sea**

M.-H. Cheng, *Department of Marine Environment and
Engineering, National Sun Yat-sen University, Taiwan*

John Hsu, *Department of Marine Environment and
Engineering, National Sun Yat-sen University, Taiwan*

**Numerical Simulation Of Tidal Currents Around
Korea/Japan Strait And Application To Speed Trial**

Hee-Su Lee, *Pusan National University, Korea*

Jong-Chun Park, *Pusan National University, Korea*

Dai-Hyun Choi, *Samsung Heavy Industries, Korea*

Se-min Jeong, *University of Tokyo, Japan*

Shigeru Tabeta, *University of Tokyo, Japan*

Shinichiro Hirabayashi, *University of Tokyo, Japan*

**A Finite Element Model Of Propagation On The
Southern And Western Australian Continental Shelf**

Marcia Isakson, *Applied Research Laboratories, University
of Texas, USA*

Nicholas Chotiros, *Applied Research Laboratories,
University of Texas, USA*

**Numerical Simulation Of Dispersion Of Volcanic
CO₂ Seeped From Seafloor By Using Multi-Scale
Ocean Model**

Muneyasu Harata, *University of Tokyo, Japan*

Toru Sato, *University of Tokyo, Japan*

Shinichiro Hirabayashi, *University of Tokyo, Japan*

**Numerical Simulation Of Tidal Currents Around
Keelung Sill Off Northern Taiwan**

Yao-Tsai Lo, *Department of Marine Environmental
Informatics, National Taiwan Ocean University*



Cheng-Han Tsai, Department of Marine Environmental Informatics, National Taiwan Ocean University
Nan-Jung Kuo, Department of Marine Environmental Informatics, National Taiwan Ocean University
Chung-Ru Ho, Department of Marine Environmental Informatics, National Taiwan Ocean University
Dong-Jiing Doong, Department of Marine Environmental Informatics, National Taiwan Ocean University
Shih-Jen Huang, Department of Marine Environmental Informatics, National Taiwan Ocean University
Hung-Jen Lee, Department of Marine Environmental Informatics, National Taiwan Ocean University
Young-Zehr Kehr, Department of Systems Engineering and Naval Architecture, National Taiwan Ocean University

Autonomous underwater vehicles 4

Bayside 104

Thursday, May 27 (8:30AM - 10:15AM)

Co-Chairs: **Mike Eichhorn**, *National Research Council Canada*
Jose Mare, *ATSA Defence Services, Australia*

Path Following Algorithm For Minimally Specified Lawn-Mower Type AUV Missions

Jose Mare, *ATSA Defence Services, Australia*

Coverage Path Planning For Harbour Surveys Using An AUV

Chengle Fang, *University of Sydney, Australia*
Stuart Anstee, *Defence Science & Technology Organisation, Australia*

Path Planning Of Autonomous Underwater Vehicles For Optimal Environmental Sampling

Feng Sun, *Zhejiang University, China*
Wen Xu, *Zhejiang University, China*
Liling Jin, *Zhejiang University, China*
Jianlong Li, *Zhejiang University, China*



Path Planning For Gliders Using Regional Ocean Models: Application Of Pinzón Path Planner With The ESEOAT Model And The RU27 Trans-Atlantic Flight Data

Enrique Fernández-Perdomo, *University Institute of Sistemas Inteligentes y Aplicaciones Numéricas en Ingeniería (SIANI), Spain*

Jorge Cabrera-Gómez, *University Institute of Sistemas Inteligentes y Aplicaciones Numéricas en Ingeniería (SIANI), Spain*

Daniel Hernández-Sosa, *University Institute of Sistemas Inteligentes y Aplicaciones Numéricas en Ingeniería (SIANI), Spain*

Josep Isern-González, *University Institute of Sistemas Inteligentes y Aplicaciones Numéricas en Ingeniería (SIANI), Spain*

Antonio Domínguez-Brito, *University Institute of Sistemas Inteligentes y Aplicaciones Numéricas en Ingeniería (SIANI), Spain*

Alex Redondo, *Department of Biology, Universidad de Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain*

Josep Coca, *Department of Biology, Universidad de Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain*

Antonio Ramos, *Department of Biology, Universidad de Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain*

Enrique Álvarez Fanjul, *Organismo Público Puertos del Estado, Spain*

Marcos García Sotillo, *Organismo Público Puertos del Estado, Spain*

A Mission Planning System For The AUV "SLOCUM Glider" For The Newfoundland And Labrador Shelf

Mike Eichhorn, *National Research Council Canada*

Ralf Bachmayer, *Memorial University of Newfoundland, Canada*

Brad Young, *Memorial University of Newfoundland, Canada*

Christopher Williams, *Institute for Ocean Technology, National Research Council Canada*



**Data assimilation and information management
Bayside 105**

Thursday, May 27 (8:30AM - 10:15AM)

Co-Chairs: **David Griffin**, *CSIRO Wealth from Oceans
Flagship, Australia*

Nugzar Margvelashvili, *CSIRO Marine &
Atmospheric Research, Australia*

**Development Of Operational Data-Assimilating
Water Quality Modelling System For South-East
Tasmania**

Nugzar Margvelashvili, *CSIRO Marine & Atmospheric
Research, Australia*

Mike Herzfeld, *CSIRO Marine & Atmospheric Research,
Australia*

John Andrewartha, *CSIRO Marine & Atmospheric
Research, Australia*

Farhan Rizwi, *CSIRO Marine & Atmospheric Research,
Australia*

John Parslow, *CSIRO Marine & Atmospheric Research,
Australia*

Emlyn Jones, *CSIRO Marine & Atmospheric Research,
Australia*

Karen Wild-Allen, *CSIRO Marine & Atmospheric Research,
Australia*

**An Operational System For The Forecasting Of
Oceanographic Conditions In The Nazare Canyon
Area (W Portugal)**

Joao Vitorino, *Instituto Hidrografico, Portugal*

Sergio Lorangeiro, *Instituto Hidrografico, Portugal*

Francisco Silva, *Instituto Hidrografico, Portugal*

José Pinto, *Instituto Hidrografico, Portugal*

Sara Almeida, *Instituto Hidrografico, Portugal*

**Software Development For The Determination Of
Instantaneous Height Of Transducer Based On The
Blend Of GPS Height And Heave**

Hongmei Zhang, *Automation Department, Wuhan
University, China*

Jianhu Zhao, *School of Geodesy and Geomatics, Wuhan
University, China*

Baohua Xu, *Survey Bureau of Hydrology and Water
Resources of Changjiang Estuary, China*



**WfSAT: A Web Based Fish Stock Assessment Tools
For Generating Fish Statistical Population
Information Using Fish Length Method**

Mustafa Man, *Department of Computer Sciences,
Universiti Malaysia Terengganu*

Mohammad Zaidi Zakaria, *Department of Fisheries
Science and Aquaculture, Universiti Malaysia Terengganu*

Fakhrul Adli Mohd Zaki, *Department of Computer
Science, Universiti Malaysia Terengganu*

**SIDIF: Location Based Technique For Spatial
Information Databases Integration Framework**

Mustafa Man, *Department of Computer Sciences,
Universiti Malaysia Terengganu*

Zailani Mohamed Sidek, *Universiti Teknologi Malaysia*

Md Yazid Mohd Saman, *Universiti Malaysia Terengganu*

Muhammad Zaidi Zakaria, *Universiti Malaysia
Terengganu*

Systems and observatories 2

Bayside 106

Thursday, May 27 (8:30AM - 10:15AM)

Co-Chairs: **Paulo de Souza**, *Tasmanian Information &
Communication Technologies Centre,
Australia*

Arjuna Balasuriya, *Massachusetts
Institute of Technology, USA*

**Behavior-Based Planning And Prosecution
Architecture For Autonomous Underwater Vehicles
In Ocean Observatories**

Arjuna Balasuriya, *Massachusetts Institute of
Technology, USA*

Stephanie Petillo, *Massachusetts Institute of Technology,
USA*

Henrik Schmidt, *Massachusetts Institute of Technology,
USA*

Michael Benjamin, *Massachusetts Institute of Technology,
USA*

**Development Of Seafloor Geodetic Observation
System Based On AUV And Submarine Cable
Technologies**

Masashi Mochizuki, *Institute of Industrial Science,*



University of Tokyo, Japan

Akira Asada, Institute of Industrial Science, University of Tokyo, Japan

Tamaki Ura, Institute of Industrial Science, University of Tokyo, Japan

Zengo Yoshida, Institute of Industrial Science, University of Tokyo, Japan

Kenichi Asakawa, Japan Agency for Marine-Earth Science and Technology

Takashi Yokobiki, Japan Agency for Marine-Earth Science and Technology

Ryoichi Iwase, Japan Agency for Marine-Earth Science and Technology

Tadanori Goto, Graduate School of Engineering, Kyoto University, Japan

Masayuki Fujita, Hydrographic and Oceanographic Department, Japanese Coast Guard

Mariko Sato, Hydrographic and Oceanographic Department, Japanese Coast Guard

Oscar Colombo, Goddard Earth Sciences and Technology Center - University of Maryland / NASA, USA

Teruki Tanaka, SEA Corporation, Japan

Hong Zheng, SEA Corporation, Japan

Kenji Nagahashi, Underwater Engineering Department, Mitsui Engineering & Shipbuilding Co.,Ltd., Japan

Acoustic Communications For Deep-Ocean Observatories: Results Of Initial Testing At The MBARI MARS Node

Lee Freitag, Woods Hole Oceanographic Institution, USA

Keenan Ball, Woods Hole Oceanographic Institution, USA

Peter Koski, Woods Hole Oceanographic Institution, USA

Sandipa Singh, Woods Hole Oceanographic Institution, USA

Eric Gallimore, Woods Hole Oceanographic Institution, USA

Marine Monitoring Using Fixed And Mobile Sensor Nodes

Paulo de Souza, Tasmanian Information & Communication Technologies Centre, Australia

Greg Timms, Tasmanian Information & Communication Technologies Centre, Australia

Andrew Davie, Tasmanian Information & Communication Technologies Centre, Australia



Ben Howell, *Tasmanian ICT Centre*

Stephen Giugni, *Tasmanian Information &
Communication Technologies Centre, Australia*

Near-Optimal Collecting Data Strategy Based On Ordinary Kriging Variance

Xinke Zhu, *Shenyang Institute of Automation, Chinese
Academy of Sciences*

Jiancheng Yu, *Shenyang Institute of Automation, Chinese
Academy of Sciences*

Shenzhen Ren, *Shenyang Institute of Automation,
Chinese Academy of Sciences*

Xiaohui Wang, *Shenyang Institute of Automation,
Chinese Academy of Sciences*

Marine radars and communications

Bayside 107

Thursday, May 27 (8:30AM - 10:15AM)

Co-Chairs: **Stuart Anderson**, *Defence Science &
Technology Organisation, Australia*

Nobukazu Wakabayashi, *Kobe University,
Japan*

On The Detection Of Marine Mammals With Ship- Borne Polarimetric Microwave Radar

Stuart Anderson, *Defence Science & Technology
Organisation, Australia*

James Morris, *Defence Science & Technology
Organisation, Australia*

X-Band Radar Derived Sea Surface Elevation Maps As Input To Ship Motion Forecasting

Konstanze Reichert, *OceanWaveS Pacific Ltd, New Zealand*

Jens Dannenberg, *OceanWaveS GmbH, Germany*

Henk van den Boom, *Maritime Research Institute,
Netherlands*

Development Of Radar Simulator Software Using AIS Data For Ship Data

Nobukazu Wakabayashi, *Kobe University, Japan*

Hidenari Makino, *Kobe University, Japan*

Kenji Mori, *Kobe University, Japan*

Shigeaki Shiotani, *Kobe University, Japan*



Performance Study On Delay Tolerant Networks In Maritime Communication Environments

Hao-Min Lin, *Department of Computer Science and Information Engineering, National Taiwan University*

Yu Ge, *Institute for Infocomm Research, Agency for Science, Technology & Research (A*STAR), Singapore*

Ai-Chun Pang, *Department of Computer Science and Information Engineering, National Taiwan University*

Jaya Pathmasuntharam, *Institute for Infocomm Research, Agency for Science, Technology & Research (A*STAR), Singapore*

A Theoretical Path Design For Long Range Over Ocean Microwave Links Using The Tropical Evaporation Duct

Andrew Kerans, *Australian Communications & Media Authority*

Andrew Kulesa, *Defence Science & Technology Organisation, Australia*

Graham Woods, *School of Engineering, James Cook University of North Queensland, Australia*

Andrew Clark, *Australian Communications & Media Authority*

THURSDAY 10:45AM – 12:30PM

Model based signal processing techniques

Bayside 101

Thursday, May 27 (10:45AM - 12:30PM)

Co-Chairs: **James Candy**, *Lawrence Livermore National Laboratory, USA*

Christophe Sintes, *Telecom-Bretagne*

Range-Dependent Acoustic Tomography By Oceanic Feature Modeling For The Monitoring Of Upwelling (Cabo Frio, Brazil)

Olivier Carrière, *Environmental Hydroacoustics Laboratory, Université libre de Bruxelles, Belgium*

Jean-Pierre Hermand, *Environmental Hydroacoustics Laboratory, Université libre de Bruxelles, Belgium*

Leandro Calado, *Marinha do Brasil - Instituto de Estudos do Mar Almirante Paulo Moreira, Brazil*

Ana de Paula, *Marinha do Brasil - Instituto de Estudos do Mar Almirante Paulo Moreira, Brazil*



Ilson Almeida da Silveira, *Instituto Oceanográfico da Universidade de São Paulo, Brazil*

Virtual Time-Reversal Processing For Source Localization In Shallow Water

Tongwei Zhang, *Marine College, Northwestern Polytechnical University, China*

Kunde Yang, *Marine College, Northwestern Polytechnical University, China*

Yuanliang Ma, *Marine College, Northwestern Polytechnical University, China*

Model-Based Detection Of Radioactive Contraband For Harbor Defense Incorporating Compton Scattering Physics

James Candy, *Lawrence Livermore National Laboratory, USA*

David Chambers, *Lawrence Livermore National Laboratory, USA*

Eric Breitfeller, *Lawrence Livermore National Laboratory, USA*

Brian Guidry, *Lawrence Livermore National Laboratory, USA*

Jerome Verbeke, *Lawrence Livermore National Laboratory, USA*

Michael Axelrod, *Lawrence Livermore National Laboratory, USA*

Kenneth Sale, *Lawrence Livermore National Laboratory, USA*

Alan Meyer, *Lawrence Livermore National Laboratory, USA*

AUV Positioning Model Employing Acoustic And Visual Data Processing

Anton Myagotin, *Institute of Marine Technology Problems, Russian Academy of Science*

Igor Burdinsky, *Pacific National University, Russia*



Underwater communications 5

Bayside 102

Thursday, May 27 (10:45AM - 12:30PM)

Chair: **Lee Freitag**, *Woods Hole Oceanographic Institution, USA*

AquaTools: An Underwater Acoustic Networking Simulation Toolkit

Anuj Sehgal, *Jacobs University, Germany*

Iyad Tumar, *Jacobs University, Germany*

Jürgen Schönwälder, *Jacobs University, Germany*

Improved Estimation Procedure For Counting Neighbours In Underwater Networks

Md. Shafiu Howlader, *Australian Defence Force Academy*

Michael Frater, *Australian Defence Force Academy*

Michael Ryan, *Australian Defence Force Academy*

A Scheduling Algorithm For Wireless Networks With Large Propagation Delays

Mandar Chitre, *Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Mehul Motani, *National University of Singapore*

Shiraz Shahabudeen, *Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore*

Choosing Packet Size In Multi-Hop Underwater Networks

Roberto Petrocchia, *La Sapienza, University of Rome, Italy*

Milica Stojanovic, *Northeastern University, USA*

Stefano Basagni, *Northeastern University, USA*

Chiara Petrioli, *La Sapienza, University of Rome, Italy*

An Integrated, Underwater Optical /Acoustic Communications System

Norman Farr, *Woods Hole Oceanographic Institution, USA*

Andrew Bowen, *Woods Hole Oceanographic Institution, USA*

Maurice Tivey, *Woods Hole Oceanographic Institution, USA*

Jonathan Ware, *Woods Hole Oceanographic Institution, USA*



Clifford Pontbriand, *Woods Hole Oceanographic Institution, USA*

Advances in understanding of marine environments in the Western Pacific 2

Bayside 103

Thursday, May 27 (10:45AM - 12:30PM)

Co-Chairs: **Toru Sato**, *University of Tokyo, Japan*

Beom-Soo Hyun, *Korea Maritime University*

Application Of The Wavelet Transform And Inverse Wavelet Transform To Analyze The Ocean Wave Signals From Data Buoys

Li-Chung Wu, *National Cheng Kung University, Taiwan*

Chia Chuen Kao, *National Cheng Kung University, Taiwan*

Dong-Jiing Doong, *National Taiwan Ocean University*

Searching For Freak Waves From In-Situ Buoy Measurements

Dong-Jiing Doong, *Department of Marine Environmental Informatics, National Taiwan Ocean University*

Li-Chung Wu, *National Cheng Kung University, Taiwan*

Infragravity Waves In The Hualien Harbor

Yi-Chung Yang, *National Taiwan Ocean University*

Cheng-Han Tsai, *National Taiwan Ocean University*

Heat Content And Steric Height Change In The Pacific Ocean

Takeshi Kawano, *Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology*

Toshimasa Doi, *Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology*

Shinya Kouketsu, *Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology*

Hiroshi Uchida, *Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology*

Masao Fukasawa, *Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology*

Yoshimi Kawai, *Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology*

Katsuro Katsumata, *Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology*



Estimation Of Exhaust Emissions Of Marine Traffic Using Automatic Identification System Data (Case Study: Madura Strait Area, Indonesia)

Trika Pitana, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

Eiichi Kobayashi, Graduate School of Maritime Sciences, Kobe University, Japan

Nobukazu Wakabayashi, Graduate School of Maritime Sciences, Kobe University, Japan

Vehicle navigation 3

Bayside 104

Thursday, May 27 (10:45AM - 12:30PM)

Chair: William Kirkwood, *mbari*

IMU-Aided Stereo Visual Odometry For Ground-Tracking AUV Applications

Marc Hildebrandt, DFKI Bremen - Robotics Innovation Center, Germany

Frank Kirchner, DFKI Bremen - Robotics Innovation Center, Germany

Long Range Acoustic Navigation Of Cruising AUV Based On Bearing Estimation

Yoshitaka Watanabe, Japan Agency for Marine-Earth Science and Technology

Hiroshi Ochi, Japan Agency for Marine-Earth Science and Technology

Takuya Shimura, Japan Agency for Marine-Earth Science and Technology

Takehito Hattori, Nippon Marine Enterprises, Japan

A Calibration Of SSBL Acoustic Positioning System In The Ocean

Takehito Hattori, Tokyo University of Marine Science and Technology / Nippon Marine Enterprises, Ltd., Japan

Yoshitaka Watanabe, Japan Agency for Marine-Earth Science and Technology

Hiroshi Ochi, Japan Agency for Marine-Earth Science and Technology

Takuya Shimura, Japan Agency for Marine-Earth Science and Technology



Accurate And Rapid Localization Of An AUV In An Absolute Reference Frame Using The Iterative Resection

Fanlin Yang, *Shandong University of Science and Technology, China*

Xiushan Lu, *Shandong University of Science and Technology, China*

Yamin Dang, *Chinese Academy of Surveying and Mapping*

Zhimin Liu, *Shandong University of Science and Technology, China*

Autonomous surface vehicles

Bayside 105

Thursday, May 27 (10:45AM - 12:30PM)

Co-Chairs: **Nuno Cruz**, *Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto), Portugal*

Chau-Chang Wang, *Institute of Applied Marine Physics and Undersea Technology, National Sun Yat-sen University, Taiwan*

Control Of Mini Autonomous Surface Vessel

Zulkifli Abidin, *Underwater Robotics Research Group (URRG), School of Electrical and Electronic Engineering, Universiti Sains Malaysia*

Mohd Rizal Arshad, *Underwater Robotics Research Group (URRG), School of Electrical and Electronic Engineering, Universiti Sains Malaysia*

Umi Kalthum Ngah, *Underwater Robotics Research Group (URRG), School of Electrical and Electronic Engineering, Universiti Sains Malaysia*

Ong Ping, *Underwater Robotics Research Group (URRG), School of Electrical and Electronic Engineering, Universiti Sains Malaysia*

Perimeter Patrol On Autonomous Surface Vehicles Using Marine Radar

Elena Oleynikova, *Franklin W. Olin College of Engineering, USA*

Nicole Lee, *Franklin W. Olin College of Engineering, USA*

Andrew Barry, *Franklin W. Olin College of Engineering, USA*

Joseph Holler, *Franklin W. Olin College of Engineering, USA*

David Barrett, *Franklin W. Olin College of Engineering, USA*



A Model Estimation And Multi-Variable Control Of An Unmanned Surface Vehicle With Two Fixed Thrusters

Jeong-Hong Park, *Korea Ocean Research & Development Institute*

Hyung-Won Shim, *Korea Ocean Research & Development Institute*

Bong-Huan Jun, *Korea Ocean Research & Development Institute*

Sea-Moon Kim, *Korea Ocean Research & Development Institute*

Pan-Mook Lee, *Korea Ocean Research & Development Institute*

Yong-Kon Lim, *Korea Ocean Research & Development Institute*

Nonlinear Modeling, Simulating And Experiment Of An Autonomous Surface Vehicle Driven By Twin Electric Thrusters

Jianhua Wang, *Shanghai Jiao Tong University, China*

Wei Gu, *Shanghai Jiao Tong University, China*

Jianxin Chu, *Shanghai Jiao Tong University, China*

Xixia Huang, *Shanghai Jiao Tong University, China*

Stereovision Aided Navigation Of An Autonomous Surface Vehicle

Jianhua Wang, *Shanghai Jiao Tong University, China*

Wei Gu, *Shanghai Jiao Tong University, China*

Jianxin Chu, *Shanghai Jiao Tong University, China*

Wangqian Niu, *Shanghai Jiao Tong University, China*

Anti-submarine warfare

Bayside 106

Thursday, May 27 (10:45AM - 12:30PM)

Chair: David Liebing, DSTO

Cooperative ASW At NURC - Moving Towards A Net-Centric Capability

Robert Been, *NATO Undersea Research Centre*

David Hughes, *NATO Undersea Research Centre*

John Potter, *NATO Undersea Research Centre*

Chris Strode, *NATO Undersea Research Centre*



Sensible Behaviour Strategies For AUVs In ASW Scenarios

David Hughes, *NATO Undersea Research Centre*

Stephanie Kemna, *NATO Undersea Research Centre*

Mike Hamilton, *NATO Undersea Research Centre*

Robert Been, *NATO Undersea Research Centre*

Improving Anti-Submarine Warfare Sonar Performance Modelling Using Range-Dependent BLUElink Forecast Environmental Data

Jarrad Exelby, *Defence Science & Technology Organisation, Australia*

Han Vu, *Defence Science & Technology Organisation, Australia*

Performance Assessment Of Sonar-System Networks For Anti-Submarine Warfare

Jane Thredgold, *Defence Science & Technology Organisation, Australia*

Matthew Fewell, *Defence Science & Technology Organisation, Australia*

Simon Lourey, *Defence Science & Technology Organisation, Australia*

Han Vu, *Defence Science & Technology Organisation, Australia*

Active Sonar Target Tracking For Anti-Submarine Warfare Applications

Jimmy Wang, *Defence Science & Technology Organisation, Australia*

Alice von Trojan, *Defence Science & Technology Organisation, Australia*

Simon Lourey, *Defence Science & Technology Organisation, Australia*



Marine geology and geophysics

Bayside 107

Thursday, May 27 (10:45AM - 12:30PM)

Co-Chairs: **Nicholas Chotiros**, *Applied Research Laboratories, University of Texas, USA*

Blair Thornton, *University of Tokyo, Japan*

The Development Of An Acoustic Probe To Measure The Thickness Of Ferro-Manganese Crusts

Blair Thornton, *University of Tokyo, Japan*

Tamaki Ura, *University of Tokyo, Japan*

Akira Asada, *University of Tokyo, Japan*

Katsumi Ohira, *Japan Probe Co. Ltd.*

Daigo Kirimura, *Link Laboratory Inc., Japan*

The Aquares Resistivity System, As An Exploration Tool For Rock Dredging Applications

Peteralv Brabers, *Demco NV, Belgium*

Jason Errey, *Demco NV, Australia*

Geomorphology And Tectonic Interpretation Of Zhujiang Submarine Canyon, In The Northern South China Sea

Xibin Han, *Second Institute of Oceanography, State Oceanic Administration, China*

Jiabiao Li, *Key Laboratory of Submarine Geosciences of SOA, China*

Fengyou Chu, *Key Laboratory of Submarine Geosciences of SOA, China*

Jun Li, *Key Laboratory of Submarine Geosciences of SOA, China*

Fanlin Yang, *Shandong University of Science and Technology, China*

Ocean Three Components Magnetometer For Seafloor Observatory

Xueting Zhang, *Zhejiang Univerisity, China*

Ying Chen, *Zhejiang Univerisity, China*

Chunyan Guan, *Hangzhou Dianzi University, China*



Seismic Imaging Of Oceanic Crust Across The Northwestern Subbasin, South China Sea

Zhenli Wu, *Second Institute of Oceanography, State Oceanic Administration, China*

Jiabiao Li, *Second Institute of Oceanography, State Oceanic Administration, China*

Aiguo Ruan, *Second Institute of Oceanography, State Oceanic Administration, China*

THURSDAY 1:30PM – 3:15PM

**SAR / ocean color and hyperspectral measurements
Bayside 101**

Thursday, May 27 (1:30PM - 3:15PM)

Chair: Roy Hughes, *DSTO*

Global Change And Remote Sensing Of CDOM In Arctic Coastal Waters

Tiit Kutser, *Estonian Marine Institute, University of Tartu*

Detection Of Coastal Bathymetry Using Hyperspectral Imagery

Enjie Jing, *Defence Science & Technology Organisation, Australia*

Bisun Datt, *HyVista Corporation, Australia*

Multi-Resolution Eddy Detection From Ocean Color And Sea Surface Temperature Images

Imen Karoui, *French Research Institute for Exploitation of the Sea*

HERVE CHAURIS, *Centre de Géosciences, MINES-ParisTech, France*

PIERRE GARREAU, *French Research Institute for Exploitation of the Sea*

Phillipe Craneguy, *Actimar, France*

Comparison Of Ship Detectors For Polarimetric SAR Imagery

David Crisp, *Defence Science & Technology Organisation, Australia*

Thomas Keevers, *Defence Science & Technology Organisation, Australia*



**InSAR Kalman Filter Phase Unwrapping Algorithm
Based On Topographic Factors**

Guolin Liu, *Shandong University of Science and
Technology, China*

Huadong Hao, *Shandong University of Science and
Technology, China*

Yamin Dang, *Chinese Academy of Surveying and Mapping*

Fanlin Yang, *Shandong University of Science and
Technology, China*

Man Yan, *Shandong University of Science and
Technology, China*

Zhixing Du, *Shandong University of Science and
Technology, China*

Underwater communications 6

Bayside 102

Thursday, May 27 (1:30PM - 3:15PM)

Co-Chairs: **Mandar Chitre**, *Acoustic Research
Laboratory, Tropical Marine Science
Institute, National University of Singapore*

Yahong Zheng, *Missouri University of
Science and Technology, USA*

**Data Driven Algorithms To Tune Physical Layer
Parameters Of An Underwater Communication Link**

Satish Shankar, *Acoustic Research Laboratory, Tropical
Marine Science Institute, National University of Singapore*

Mandar Chitre, *Acoustic Research Laboratory, Tropical
Marine Science Institute, National University of Singapore*

Melani Jayasuriya, *Department of Electrical and Computer
Engineering, National University of Singapore*

**The Performance Analysis Of Diversity Technologies
For Underwater Moving Channel Environments
Using Experimental Data**

Hak-Lim Ko, *Hoseo University, Korea*

Min-Sang Kim, *Hoseo University, Korea*

Seung-goo Lee, *Hoseo University, Korea*

Jae-Hoon Jung, *Hoseo University, Korea*

Jong-Won Park, *Maritime & Ocean Engineering Research
Institute, Korea*

Yong-Kon Lim, *Maritime & Ocean Engineering Research
Institute, Korea*



Capacity Analysis Of Underwater Acoustic MIMO Communications

Pierre-Jean Bouvet, *Underwater Acoustics Lab, Institut Supérieur de l'Electronique et du Numerique Brest, France*

Alain Loussert, *Underwater Acoustics Lab, Institut Supérieur de l'Electronique et du Numerique Brest, France*

Turbo Detection For Mobile MIMO Underwater Acoustic Communications

Jun Tao, *University of Missouri - Columbia, USA*

Yahong Zheng, *Missouri University of Science and Technology, USA*

Chengshan Xiao, *Missouri University of Science and Technology, USA*

Bandwidth-Efficient Frequency-Domain Equalization For MIMO Underwater Acoustic Communications

Jian Zhang, *Missouri University of Science and Technology, USA*

Yahong Zheng, *Missouri University of Science and Technology, USA*

Advances in integrated marine observing systems 3 Bayside 103

Thursday, May 27 (1:30PM - 3:15PM)

Chair: Simon Allen, *University of Tasmania*

Automated Assessment Of Data Quality In Marine Sensor Networks

Greg Timms, *Tasmanian Information & Communication Technologies Centre, Australia*

Paulo de Souza, *Tasmanian Information & Communication Technologies Centre, Australia*

Leon Reznik, *Department of Computer Sciences, Rochester Institute of Technology, USA*

Autonomous Adaptive Environmental Assessment And Feature Tracking Via Autonomous Underwater Vehicles

Stephanie Petillo, *Massachusetts Institute of Technology, USA*

Arjuna Balasuriya, *Massachusetts Institute of Technology, USA*

Henrik Schmidt, *Massachusetts Institute of Technology,*



USA

Autonomous Profiling Glider Observations In Storm Bay

Farhan Rizwi, *Marine and Atmospheric Research, CSIRO, Australia*

Lindsay MacDonald, *Marine and Atmospheric Research, CSIRO, Australia*

Karen Wild-Allen, *Marine and Atmospheric Research, CSIRO, Australia*

Emlyn Jones, *Marine and Atmospheric Research, CSIRO, Australia*

The Integrated Marine Observing System: Delivering Data-Streams To Support Marine Research And Applications.

Roger Proctor, *Integrated Marine Observing System, University of Tasmania, Australia*

Tim Moltmann, *Integrated Marine Observing System, University of Tasmania, Australia*

Katy Hill, *Integrated Marine Observing System, University of Tasmania, Australia*

Marian McGowen, *Integrated Marine Observing System, University of Tasmania, Australia*

A Framework For Marine Sensor Network & Autonomous Vehicle Interaction

Matthew Dunbabin, *CSIRO Information & Communication Technologies, Australia*

Peter Corke, *Queensland University of Technology, Australia*

Vehicle design 2

Bayside 104

Thursday, May 27 (1:30PM - 3:15PM)

Co-Chairs: Hayato Kondo, *Tokyo University of Marine Science and Technology, Japan*

Ji-Hong Li, *Pohang Institute of Intelligent Robotics, Korea*

Development Of An Intelligent Autonomous Underwater Vehicle, P-SURO

Ji-Hong Li, *Pohang Institute of Intelligent Robotics, Korea*

Byung-Ho Yoon, *Pohang Institute of Intelligent Robotics, Korea*



Seung-Sub Oh, *Pohang Institute of Intelligent Robotics, Korea*

Jung-San Cho, *Pohang Institute of Intelligent Robotics, Korea*

Jong-Geol Kim, *Pohang Institute of Intelligent Robotics, Korea*

Mun-Jik Lee, *Pohang Institute of Intelligent Robotics, Korea*

Jung-Woo Lee, *Pohang Institute of Intelligent Robotics, Korea*

Biomimetic Mechanical Design For Soft-Bodied Underwater Vehicles

Maria Fiazza, *University of Verona, Italy*

Taavi Salumäe, *Center for Biorobotics, Tallinn University of Technology, Estonia*

Guntis Kulikovskis, *Department of Theoretical Mechanics, Riga Technical University, Latvia*

Robert Templeton, *University of Bath, UK*

Otar Akanyeti, *University of Verona, Italy*

William Megill, *University of Bath, UK*

Paolo Fiorini, *University of Verona, Italy*

Maarja Kruusmaa, *Center for Biorobotics, Tallinn University of Technology, Estonia*

Madis Listak, *Tallinn University of Technology, Estonia*

Terramechanics Based Traction Control Of Underwater Wheeled Robot

Tjasa Boh, *University of Southern Queensland, Australia*

John Billingsley, *University of Southern Queensland, Australia*

Robin Bradbeer, *City University, Hong Kong*

Paul Hodgson, *City University, Hong Kong*

On Fault-Tolerant Control Of A Hovering AUV With Four Horizontal And Two Vertical Thrusters

Jin-Kyu Choi, *Tokyo University of Marine Science and Technology, Japan*

Hayato Kondo, *Tokyo University of Marine Science and Technology, Japan*

Design And Concept Of A Biointeractive Autonomous Underwater Vehicle "BA-1"

Hayato Kondo, *Tokyo University of Marine Science and*



Technology, Japan

Kenji Nakane, Mitsui Engineering & Shipbuilding Co., Ltd., Japan

Etsuro Shimizu, Tokyo University of Marine Science and Technology, Japan

Jin-Kyu Choi, Tokyo University of Marine Science and Technology, Japan

Kenji Nagahashi, Mitsui Engineering & Shipbuilding Co., Ltd., Japan

Masakazu Matsushima, Mitsui Engineering & Shipbuilding Co., Ltd., Japan

Yasunori Nishida, Mitsui Engineering & Shipbuilding Co., Ltd., Japan

Takafumi Arimoto, Tokyo University of Marine Science and Technology, Japan

Yoshinori Miyamoto, Tokyo University of Marine Science and Technology, Japan

Kazuo Amakasu, Tokyo University of Marine Science and Technology, Japan

Makoto Endo, Tokyo University of Marine Science and Technology, Japan

Ryosuke Matsui, Mitsui Engineering & Shipbuilding Co., Ltd., Japan

Array signal processing and array design 2

Bayside 105

Thursday, May 27 (1:30PM - 3:15PM)

Chair: Michael Clark, Thales

Calibration Uncertainty Of Assembled Array Hydrophones

Yujin Gao, Thales, Australia

Peter Harvey, Thales, Australia

Patrick Cooper, Thales, Australia

Paul Bake, Thales, Australia

Fiber Laser Sensor Hydrophone Performance

Ian Bedwell, Thales, Australia

Dave Jones, Thales, Australia

Improved Noise Performance Of A DFB Fibre Laser Sonar Array Using A Frequency Reference

Andrew Michie, University of Sydney, Australia

David Jones, Thales, Australia



David Wang, *University of Sydney, Australia*

David Mann, *Thales, Australia*

Mattias Aslund, *University of Sydney, Australia*

Simon Fleming, *University of Sydney, Australia*

John Canning, *University of Sydney, Australia*

**Antenna Design And Performance Assessment For
Fast High Resolution Sonar Imaging Using High
Bandwidth Transducers And Frequency Domain
Compounding**

Franzjosef Becker, *Fraunhofer Institute for Biomedical
Technology, Germany*

Christian Degel, *Fraunhofer Institute for Biomedical
Technology, Germany*

Heinrich Fonfara, *Fraunhofer Institute for Biomedical
Technology, Germany*

Holger Hewener, *Fraunhofer Institute for Biomedical
Technology, Germany*

Hansjoachim Welsch, *Fraunhofer Institute for Biomedical
Technology, Germany*

Steffen Tretbar, *Fraunhofer Institute for Biomedical
Technology, Germany*

Marc Fournelle, *Fraunhofer Institute for Biomedical
Technology, Germany*

Robert Lemor, *Fraunhofer Institute for Biomedical
Technology, Germany*

**Spatio-Temporal Signal Twice-Whitening
Algorithms On The hx3100 Ultra-Low Power
Multicore Processor**

Travis Humble, *Oak Ridge National Laboratory, USA*

Pramita Mitra, *University of Notre Dame, USA*

Bryan Schleck, *Coherent Logix, USA*

Jacob Barhen, *Oak Ridge National Laboratory, USA*

John Polcari, *Science Applications International
Corporation, USA*

Michael Traweck, *Office of Naval Research, USA*



Maritime security and harbour protection

Bayside 106

Thursday, May 27 (1:30PM - 3:15PM)

Chair: Alan Theobald, DSTO

Using Collaborative Autonomous Vehicles In Mine Countermeasures

Vladimir Djapic, *NATO Undersea Research Centre*
Dula Nad, *University of Zagreb, Croatia*

Autonomy For Operational MCM AUVs, Based On High Resolution Sonar

Nicolas Mandelert, *Thales Underwater Systems, France*
Julien Ferrand, *Thales Underwater Systems, France*
Patrick Cooper, *Thales, Australia*

Cooperative Autonomy For Contact Investigation

Toby Schneider, *Massachusetts Institute of Technology, USA*
Henrik Schmidt, *Massachusetts Institute of Technology, USA*
Thomas Pastore, *NATO Undersea Research Centre*
Michael Benjamin, *Naval Undersea Warfare Centre, USA*

Towards The Use Of A Team Of USVs For Civilian Harbour Protection: The Problem Of Intercepting Detected Menaces

Alessio Turetta, *Department of Communication Computer and System Sciences, University of Genova, Italy*
Giuseppe Casalino, *Department of Communication Computer and System Sciences, University of Genova, Italy*
Enrico Simetti, *Department of Communication Computer and System Sciences, University of Genova, Italy*
Matteo Cresta, *Selex Sistemi Integrati, Italy*

Operational Experiences For Maritime Homeland Security Operations

Alastair Cormack, *SeeByte Ltd, UK*
David Lane, *SeeByte Ltd, UK*
Jon Wood, *SeeByte Ltd, UK*



Sustainable energy in East Asia

Bayside 107

Thursday, May 27 (1:30PM - 3:15PM)

Co-Chairs: **Beom-Soo Hyun**, *Korea Maritime University*

Toru Sato, *University of Tokyo, Japan*

Current Status And Future Prospects Of Electric Generators Using Electroactive Polymer Artificial Muscle

Seiki Chiba, *SRI International, USA*

Mikio Waki, *Hyperdrive Corporation, Japan*

Koichi Masuda, *Nihon University, Japan*

Tomoki Ikoma, *Nihon University, Japan*

A Wave Focusing Device For OWC Wave Energy Converter

Beom-Soo Hyun, *Korea Maritime University*

Zhen Liu, *Ocean University of China*

JiYuan Jin, *Korea Maritime University*

Yong Hyeon Choi, *Korea Maritime University*

Hongda Shi, *Ocean University of China*

Qin Zhang, *Ocean University of China*

A Pilot Project On Ocean Energy Generation By Tidal Currents On The Northern Coast Of Taiwan

Cheng-Han Tsai, *National Taiwan Ocean University*

Dong-Jiing Doong, *National Taiwan Ocean University*

Young-Zehr Kehr, *National Taiwan Ocean University*

Hsien-Wen Li, *Minghsin University of Science and Technology, Taiwan*

Chung-Ru Ho, *National Taiwan Ocean University*

Nan-Jung Kuo, *National Taiwan Ocean University*

Shih-Jen Huang, *National Taiwan Ocean University*

Yao-Tsai Lo, *National Taiwan Ocean University*

Hung-Jen Lee, *National Taiwan Ocean University*

A Study On An Experiment Of Behavior Of A Spar Type Offshore Wind Turbine Considering Rotation Of Wind Turbine Blades

Motohiko Murai, *Yokohama National University, Japan*

Ryuji Nishimura, *Yokohama National University, Japan*



Mitigation Of Environmental Impact Of Power-Plant Discharge By Use Of Ocean Thermal Energy Conversion System

Hyeon-Ju Kim, *Korea Ocean Research & Development Institute*

Ho-Saeng Lee, *Korea Ocean Research & Development Institute*

Seung-Won Lee, *Korea Ocean Research & Development Institute*

Dong-Ho Jung, *Korea Ocean Research & Development Institute*

Deok-Soo Moon, *Korea Ocean Research & Development Institute*

THURSDAY 3:45PM – 5:30PM

Underwater communications 7

Bayside 102

Thursday, May 27 (3:45PM - 5:30PM)

Co-Chairs: **Saman Abeysekera**, *Nanyang Technological University, Singapore*

Pierre-Jean Bouvet, *Underwater Acoustics Lab, Institut Supérieur de l'Electronique et du Numerique Brest, France*

Frequency-Domain Channel Estimation For Nonlinear Multicarrier Underwater Communication Systems

Ching-Hsiang Tseng, *Department of Electrical Engineering, National Taiwan Ocean University*

Chin-Feng Lin, *Department of Electrical Engineering, National Taiwan Ocean University*

Fu-Sheng Lu, *Department of Electrical Engineering, National Taiwan Ocean University*

Hsien-Sen Hung, *Department of Electrical Engineering, National Taiwan Ocean University*

Tzong-Dar Wu, *Department of Electrical Engineering, National Taiwan Ocean University*

Hoang-Yang Lu, *Department of Electrical Engineering, National Taiwan Ocean University*

Shun-Hsyung Chang, *Department of Electrical Engineering, National Taiwan Ocean University*



Dynamic Compact Control Language: A Compact Marshalling Scheme For Acoustic Communications

Toby Schneider, *Massachusetts Institute of Technology, USA*

Henrik Schmidt, *Massachusetts Institute of Technology, USA*

Virtual Unequal Error Protection In Underwater Image Transmission

Laura Toni, *Italian Institute of Technology*

Lorenzo Rossi, *Italian Institute of Technology*

Nazim Agoulmine, *LRSN, University of Evry, Val d'Essonne, France*

Jean Guy Fontaine, *Italian Institute of Technology*

Robust Discrete Fourier Transform Based Receivers For Continuous Phase Modulation

Saman Abeysekera, *Nanyang Technological University, Singapore*

Wen Wang, *Nanyang Technological University, Singapore*

Buoy technology

Bayside 103

Thursday, May 27 (3:45PM - 5:30PM)

Co-Chairs: **Lindsay Pender**, *CSIRO Marine & Atmospheric Research, Australia*

David Hughes, *CSIRO Marine & Atmospheric Research, Australia*

A Robust Satellite Telemetry System For IMOS Moorings

David Hughes, *CSIRO Marine & Atmospheric Research, Australia*

Tim Lynch, *CSIRO Marine & Atmospheric Research, Australia*

Lindsay Pender, *CSIRO Marine & Atmospheric Research, Australia*

Matthew Sherlock, *CSIRO Marine & Atmospheric Research, Australia*



An Anchor Mooring Profile Monitoring Buoy Based On Underwater Non-Contact Wireless Communication

Jing Liu, *Wuhan University of Technology, China*

Guang Zhang, *Wuhan University of Technology, China*

Hai Yu, *School of Electronics & Information, Hangzhou Dianzi University, China*

Xue Zhang, *School of Electronics & Information, Hangzhou Dianzi University, China*

Design And Application Of Buoy System For On-The-Fly Observation Of Surface Current In Closure Water Area

Yuliang Gu, *Qingcao Sha Investment and Construction Corporation Ltd., China*

Fengnian Zhou, *Survey Bureau of Hydrology and Water Resources of Changjiang Estuary, China*

Baohua Xu, *Survey Bureau of Hydrology and Water Resources of Changjiang Estuary, China*

Jianhu Zhao, *School of Geodesy and Geomatics, Wuhan University, China*

Pulse - A Mooring For Mixed Layer Measurements In The Open Ocean And Extreme Weather

Lindsay Pender, *CSIRO Marine & Atmospheric Research, Australia*

Tom Trull, *CSIRO Marine & Atmospheric Research, Australia*

Danny McLaughlan, *CSIRO Marine & Atmospheric Research, Australia*

Tim Lynch, *CSIRO Marine & Atmospheric Research, Australia*

CDS-Based Coverage Control Algorithm For Buoys Based Sensor Networks

Wenyu Cai, *Hangzhou Dianzi University, China*

Jing-Biao Liu, *Hangzhou Dianzi University, China*

Xue-Ting Zhang, *Zhejiang University, China*



Collaborative autonomous vehicles 2

Bayside 104

Thursday, May 27 (3:45PM - 5:30PM)

Co-Chairs: **Vladimir Djapic**, *NATO Undersea Research Centre*

Ryan Smith, *University of Southern California, USA*

Cooperative Multi-AUV Tracking Of Phytoplankton Blooms Based On Ocean Model Predictions

Ryan Smith, *University of Southern California, USA*

Jnaneshwar Das, *University of Southern California, USA*

Yi Chao, *Jet Propulsion Laboratory, California Institute of Technology, USA*

David Caron, *University of Southern California, USA*

Burton Jones, *University of Southern California, USA*

Gaurav Sukhatme, *University of Southern California, USA*

Chemical Plume Source Localization With Multiple Autonomous Underwater Vehicles

Bernardo Maciel, *Underwater Systems and Technologies Laboratory, Faculty of Engineering, University of Porto, Portugal*

João Sousa, *Underwater Systems and Technologies Laboratory, Faculty of Engineering, University of Porto, Portugal*

Fernando Pereira, *Underwater Systems and Technologies Laboratory, Faculty of Engineering, University of Porto, Portugal*

Measurement Of Magnetic Field Using Collaborative AUVs

Jesse Pentzer, *University of Idaho, USA*

Brendan Crosbie, *University of Idaho, USA*

Jim Frenzel, *Center for Intelligent Systems Research, University of Idaho, USA*

John Canning, *Center for Intelligent Systems Research, University of Idaho, USA*

Thomas Bean, *Center for Intelligent Systems Research, University of Idaho, USA*

Michael Anderson, *Department of Mechanical Engineering, University of Idaho, USA*

Dean Edwards, *Center for Intelligent Systems Research, University of Idaho, USA*



Cooperative Autonomous Underwater Vehicle Localization

Marcelo Nogueira, *Faculdade de Engenharia da Universidade do Porto, Portugal*

João Sousa, *Faculdade de Engenharia da Universidade do Porto, Portugal*

Fernando Manuel Pereira, *Faculdade de Engenharia da Universidade do Porto, Portugal*

RT2: A Real-Time Ray-Tracing Method For Acoustic Distance Evaluations Among Cooperating AUVs

Giuseppe Casalino, *Department of Communication Computer and System Sciences, University of Genova, Italy*

Andrea Caiti, *Department of Electrical Systems and Automation, University of Pisa, Italy*

Alessio Turetta, *Department of Communication Computer and System Sciences, University of Genova, Italy*

Enrico Simetti, *Department of Communication Computer and System Sciences, University of Genova, Italy*

Data visualization and information management Bayside 105

Thursday, May 27 (3:45PM - 5:30PM)

Co-Chairs: Kate Beard, *University of Maine, USA*

Scott Bainbridge, *Australian Institute of Marine Science*

The Design Of A Novel Time Series Client For Ocean Data.

Scott Bainbridge, *Australian Institute of Marine Science*

Development Of The Red Sea Biogeographic Information System

Fahmi Machda, *King Abdullah University of Science and Technology, Saudi Arabia*

Norú Ichim-Moreno, *King Abdullah University of Science and Technology, Saudi Arabia*

Chandra Prasetyo, *King Abdullah University of Science and Technology, Saudi Arabia*

Christian Voolstra, *King Abdullah University of Science and Technology, Saudi Arabia*



**Extracting Valuable Information From A
Simultaneous Visualization Of Science And
Engineering Data Obtained With An Autonomous
Underwater Vehicle**

Robert Robinson, *School of Computing and Information
Systems, University of Tasmania, Australia*

Paulo de Souza, *Tasmanian Information & Communication
Technologies Centre, Australia*

Andrew Davie, *Tasmanian Information & Communication
Technologies Centre, Australia*

**The EventViewer: A Tool For Visualizing And
Exploring Events Extracted From Ocean Observing
System Data**

Kate Beard, *University of Maine, USA*

Heather Deese, *Island Institute, USA*

Neal Pettigrew, *University of Maine, USA*

Jake Emerson, *University of Maine, USA*

**Sonar and transducers / oceanographic sensors
Bayside 106**

Thursday, May 27 (3:45PM - 5:30PM)

Co-Chairs: **Kenichi Asakawa**, *Japan Agency for
Marine-Earth Science and Technology*

Paul Macoun, *VENUS Facility, University of
Victoria, Canada*

**Long-Term Stability Of A New Conductivity-
Temperature Sensor Tested On The VENUS Cabled
Observatory**

Tomohiro Horiuchi, *Rockland Oceanographic Services Inc.,
Canada*

Fabian Wolk, *Rockland Oceanographic Services Inc.,
Canada*

Paul Macoun, *VENUS Facility, University of Victoria,
Canada*

**A Pressure-Neutral Acoustic Transmit Receive
Module (PR-TRM) With Integrated Data Processing
For Deep Sea Applications**

Matthias Molitor, *Fraunhofer Institute for Biomedical
Technology, Germany*

Manfred Moses, *Fraunhofer Institute for Biomedical
Technology, Germany*



Marc Schmieger, *Fraunhofer Institute for Biomedical Technology, Germany*

Olaf Walter, *Fraunhofer Institute for Biomedical Technology, Germany*

Peter Weber, *Fraunhofer Institute for Biomedical Technology, Germany*

Robert Lemor, *Fraunhofer Institute for Biomedical Technology, Germany*

Modeling And Theoretical Characterization Of Circular pMUT For Immersion Applications

Mohd Ikhwan Hadi Yaacob, *Universiti Sains Malaysia*

Mohd Rizal Arshad, *Universiti Sains Malaysia*

Asrulnizam Abd Manaf, *Universiti Sains Malaysia*

Standard Target Calibration Of Broad-Band Active Sonar Systems In A Laboratory Tank

Alan Islas-Cital, *University of Birmingham, UK*

Philip Atkins, *University of Birmingham, UK*

Kae Foo, *University of Birmingham, UK*

Evaluation Of Small Models Of Ceramic Housings For 11,000m Ocean Bottom Seismometers

Kenichi Asakawa, *Japan Agency for Marine-Earth Science and Technology*

Makoto Ito, *Nippon Marine Enterprises, Ltd., Japan*

Tadahiro Hyakudome, *Japan Agency for Marine-Earth Science and Technology*

Marine environmental engineering in East Asia Bayside 107

Thursday, May 27 (3:45PM - 5:30PM)

Co-Chairs: Dong-Jiing Doong, *Department of Marine Environmental Informatics, National Taiwan Ocean University*

Yusaku Kyojuka, *Kyushu University, Japan*

A Feasibility Study On The Water Quality Improvement By Making Use Of Underground Water In Hakata Bay

Yusaku Kyojuka, *Kyushu University, Japan*

Yasufumi Uchida, *Kyushu University, Japan*

Ayano Kudoh, *Kyushu University, Japan*



Shigeyasu Kawaguchi, *Hakata-wan Kankyou Seibi Co., Ltd, Japan*

Assessment Of Environmental Restoration Plans For A Small-Scale Beach By Simulation-Based Habitat Evaluation

Shigeru Tabeta, *University of Tokyo, Japan*

Rikito Hisamatsu, *University of Tokyo, Japan*

Impact Of River Discharge On Surface Water Variability In Amagasaki Port, Japan

Ryoichi Yamanaka, *University of Tokushima, Japan*

Yasunori Kozuki, *University of Tokushima, Japan*

Machi Miyoshi, *Tokushima Bunri University, Japan*

Fumiko Nogami, *University of Tokushima, Japan*

Treatment Of Waste Seawater By Electrolysis Using Charcoal Electrodes

Daisuke Kitazawa, *Institute of Industrial Science, University of Tokyo, Japan*

Masatoshi Fujino, *Institute of Industrial Science, University of Tokyo, Japan*

Shunsuke Aoba, *Graduate School of Engineering, The University of Tokyo, Japan*



Exhibitors and Patrons

ATSA Defence Services

Contact: Jenny Taylor

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Email: jenny.taylor@atsa.com.au

Phone: +61 2 4964 3500

Booth: 37

SUS provides underwater systems for defence, offshore industry and civil security. By integrating long-standing traditions with the latest advances in underwater technology, we meet our customers needs and requirements, both on and under the surface.

Australian Hydrographic Service

Contact: Melinda McMullen

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Email: melinda.mcmullen@defence.gov.au

Phone: +61 2 4223 6665

Booth: 35

The Australian Hydrographic Service - the national charting authority for hydrographic standards and services including provision of official nautical charts and publications to support safe navigation.

CSIRO

Contact: Nancy Jensen

Website: www.csiro.au

Email: Nancy.Jensen@csiro.au

Phone: + 61 2 9490 8467

Booth: 18

CSIRO is Australia's national science agency, with ~6,000 staff. Our science includes oceans, climate, energy, food & agriculture, water, health, landscapes, safeguarding Australia, the universe, materials & manufacturing, minerals & ICT.

Demco NV/OEMG Global

Contact: Jason Errey

Website: www.oemg-global.com □

Email: jasonerrey@oemg-global.com

Phone: +61 423 112 472

Booth: 70



Jason has 15 years experience in the oceanographic industry including degrees in oceanography and geochemistry. He now is a director at OEMG Global and has partnered with Demco NV to bring the Aquares Resistivity System to Australasia.

DSTO

Contact: Julie Bebbington

Website: www.dsto.defence.gov.au

Email: julie.bebbington@dsto.defence.gov.au

Phone: +61 8 8259 4025

Booth: 48

The Defence Science and Technology Organisation (DSTO), is the Australian Government's lead agency charged with applying science and technology to protect and defend Australia and its national interests.

ESRI/Ivs3d

Contact: Kristin Frith

Email: kfrith@esri.com

Booth: 52, 53

Fastwave Communications

Contact: Nick Daws

Website: www.fastwave.com.au

Email: nick@fastwave.com.au

Phone: +61 8 9486 4256

Booth: 69

Fastwave is an Iridium Satellite integrator and developer of data acquisition systems to monitor, control and track remote assets. The field-proven OceanStar coastal marine monitoring system delivers on-line data from sub-sea sensors within seconds.

Graal Tech

Contact: Alessio Turetta

Website: www.graaltech.it

Email: alessio.turetta@graaltech.it

Phone: +39 0108597683

Booth: 55

Graal Tech is a research and consultancy SME working in the fields of robotics, control system design, instrumentation and mechatronic engineering. The main application area is underwater robotics and integrated systems for marine applications.



Helzel Messtechnik GmbH

Website: www.helzel.com

Email: WERA@Helzel.com

Phone: +49 4191 9520 0

Booth: 59, 60 (Co-exhibitor)

Leader in reliable high-quality ocean current, wave and wind mapping: TÜV certified manufacturer of the WERA HF ocean radar system. The WERA system is the one and only ocean radar with the flexibility to be configured very compact for the Direction Finding mode or for the high reliable and precise Beam Forming mode with 8 to 16 antennae. These systems are available for high resolution (150 m) short range (15 km) applications or for longest ranges of up to 300 km. The temporal resolution is from 3 minutes. Operating frequencies 5 – 50 MHz. Applications areas include: Port Authorities; Met Offices; Marine Park Managers; Off-shore Industries; Search and Rescue; Maritime Operations; Tourism.

Hyvista Corporation Pty Ltd

Contact: Lyndall Purdy

Website: www.hyvista.com

Email: lyndall@hyvista.com

Phone: +61 2 8850 0262

Booth: 51

HyVista specialises in the supply of airborne hyperspectral remote sensing imagery & information products for a wide range of applications including geological mapping, mineral exploration, water quality monitoring, agriculture and land use planning

Imbros

Contact: Juanita Poli

Email: juanita.poli@imbros.com.au info@imbros.com.au

Phone: +61 3 6216 1500 Fax: +61 3 6216 1555

Booth: 61

Imbros supplies and supports a wide range of equipment for Oceanographic and Environmental Monitoring in Australasia. Imbros' principals – including Sea-Bird Electronics, Wet Labs, Satlantic, Nortek, Contros, EvoLogics, VideoRay and BlueView Technologies – are exhibiting their instrumentation and technology for today's marine science projects, and are available for technical and commercial discussions.



Marine Technology Society

Contact: Liz Corbin

Website: www.mtsociety.org

Email: chris.barrett@mtsociety.org

Phone: 410 884 5330

Booth: 17

The Marine Technology Society is an international, not-for-profit professional society of ocean engineers, technologists, policy makers, the military, and educators. Founded in 1963, the society fosters education, networking, and information-sharing through conferences, workshops, local section meetings and technical committees. The society publishes a bimonthly newsletter, a monthly electronic newsletter, and six annual issues of a peer-reviewed journal.

Metocean Services International

Contact: Stefan Stimson

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Email: stefan@metoceanservices.com

Phone: +61 3 6224 0788

Booth: 62, 63, 64

Metocean Services International provide the entire range of oceanographic and meteorological services to the commercial and scientific community. Located in South Africa and Australia, MSI has conducted projects in over 27 countries since 2003.

Myriax Software Pty Ltd

Contact: Hugh Pederson

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Email: hugh.pederson@eonfusion.myriax.com

Phone: +61 439 858 742

Booth: 54

Myriax Pty Ltd is a group of R&D companies dedicated to the development of cutting edge technology. Eonfusion is Myriax's revolutionary 4D visual analysis software program at the leading edge of geospatial analysis and visualisation technology.

Naval Undersea Warfare Center

Contact: John (Jack) Griffin

Email: john.f.griffin@navy.mil

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Oceanic Engineering Society

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The Oceanic Engineering Society (OES) of the Institute of Electrical and Electronics Engineers, Inc. (IEEE) seeks to advance the science and technology of Ocean Engineering. Stop by the IEEE/OES booth for membership information.

OCEANS'10 MTS/IEEE Seattle

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Phone: 310 937 1006

Booth: 8 (See Oceanic Engineering Society)

OCEANS 2010 MTS/IEEE SEATTLE will take place September 19-24, 2010 in the Washington State Convention and Trade Center in Seattle, WA USA. Join us in Seattle.

OceanWaveS Pacific Ltd

Email: kreichert@oceanwaves-pacific.co.nz

Phone: +64 4 5867895

Booth: 59, 60 (Co-exhibitor)

OceanWaveS is the manufacturer of WaMoS II, a Wave Monitoring System, that is based on standard marine X-Band radar technology. WaMoS II measures and displays all the essential wave field parameters such as significant wave height, period and direction, as well as surface current speed and direction. WaMoS II is applied within the offshore and shipping industry as well as for coastal monitoring. WaMoS II is embedded in various international industry and R&D projects, with new features being continuously developed.

ODIM Brooke Ocean

Contact: Derrick Peyton

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Booth: 66

ODIM Brooke Ocean specializes in the development of advanced data collection equipment and systems such as the ODIM MVP,



FFCPT and LOPC. We also supply Launch and Recovery Systems (LARS) for USVs, UUVs, and related oceanographic systems.

ORE Offshore

Contact: Gregory MacEachern

Website: www.ore.com and www.edgetech.com

Email: Greg@ore.com

Phone: +1 508 291 0960

Booth: 58

EdgeTech designs and develops side scan sonar, sub-bottom profilers, bathymetric, combined, integrated and custom-engineered products. ORE Offshore manufactures highly accurate USBL tracking systems, acoustic releases and custom-engineered products.

PortMap Remote Ocean Sensing Pty Ltd

Email: portmap@gotalk.net.au

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Booth: 59, 60 (Co-exhibitor)

PortMap ROS manufactures the high resolution PortMap VHF coastal ocean radar. PortMap provides integrated solutions to coastal engineering problems like sewage outfalls, salinity and warm water outfalls, dredging plumes and environmental flows in Ports, channels and around headlands, islands and reefs. The PortMap radar has spatial resolution of 100 m with a range of over 3 km, and time resolution of 5 minutes. It is the ideal observation system for mapping currents in Ports and Harbours.

RF Forschungsschiffahrt GmbH

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Booth: 38

RF operates own and public research vessels around the world. The own vessel SONNE operates Pacific & Indian Ocean. It is free for charter for approx. 100 days a year. It was chartered by India, New Zealand, Australia, Indonesia, Korea, China.



SeaBotix Inc. Australia Office

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Booth: 49

SeaBotix Inc. manufactures underwater remotely-operated vehicles including the Little Benthic Vehicle (LBV) and Little Benthic Crawler (LBC). New for 2010 is the revolutionary vLBV, which is the first small vectored ROV.

Seismic Asia Pacific

Contact: Ian Wegner

Email: Ian.W@seismic.com.au

Booth: 28, 29, 30, 31

Swathe Services (Australia) Pty Ltd + Valeport Ltd

Contact: Carolyn Hewitt

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Phone: +61 434 417 018

Booth: 65

Swathe Services provide personnel, equipment, support and consultation to the hydrographic industry. Valeport are a leading manufacturer of hydrometric and oceanographic instruments.

UVS

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Booth: 56, 57

Please visit the UVS stand where you will be able to see the latest subsea technology and talk to company representatives from DeepSea Power & Light, Teledyne RD Instruments, Teledyne Bethos, Liquid Robotics, Flotation Technologies, SEACON and others



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Annual Review & Forecast

FEBRUARY

Instrumentation: Measurement, Processing & Analysis

****Oceanology International**, March 9-11, London, England

MARCH

Electronic Charting/Vessel Management/Ports & Harbors/Dredging/Homeland Security

****Global Marine Renewable Energy Conference**, April 14-15, Seattle, WA

APRIL

Offshore Technology/Alternative Energy & Ocean Engineering

****Offshore Technology Conference**, May 3-6, Houston, TX

****Oceans '10 IEEE Sydney**, May 24-27, Sydney, Australia

****PACON 2010**, June 1-5, Hilo, HI

MAY

Communications, Telemetry, Data Processing

****PACON 2010**, June 1-5, Hilo, HI

****UDT Europe 2010**, June 8-10, Hamburg, Germany

****Canadian Hydrographic Conference**, June 20-23, Québec City, Canada

JUNE

Seafloor Mapping/Sonar Systems/Vessels

JULY

Deck Gear, Cable, Connectors & Power Systems

AUGUST

Ocean Resources Development & Coastal Zone Management

****UDT Asia 2010**, September 15-16, Singapore

****Oceans '10 MTS/IEEE**, September 19-24, Seattle, WA

****Euronaval 2010**, October 25-29, Paris LeBourget, France

SEPTEMBER

Geophysical Exploration/Seafloor Engineering

****SEG 2010**, October 17-22, Denver, CO

OCTOBER

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NOVEMBER

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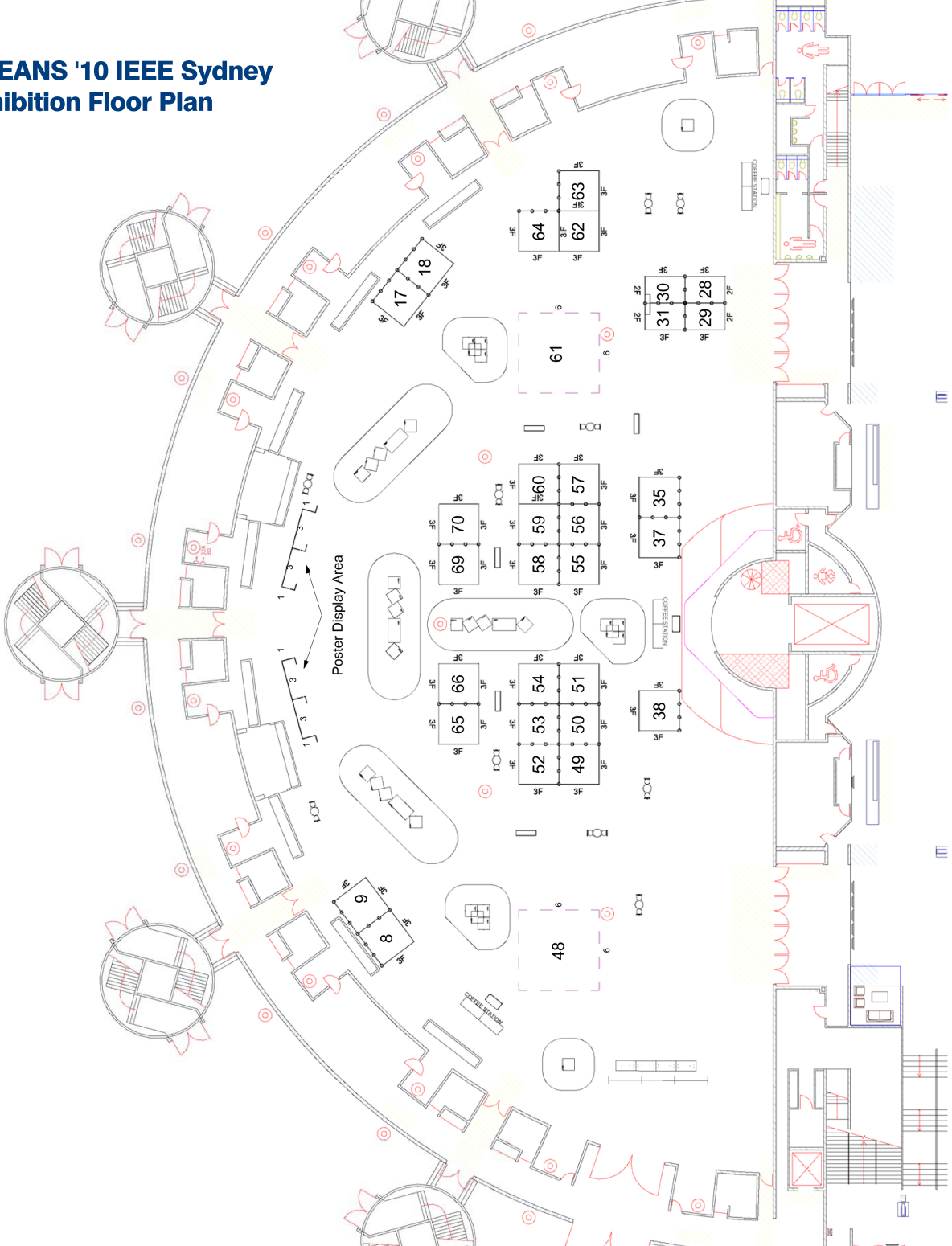


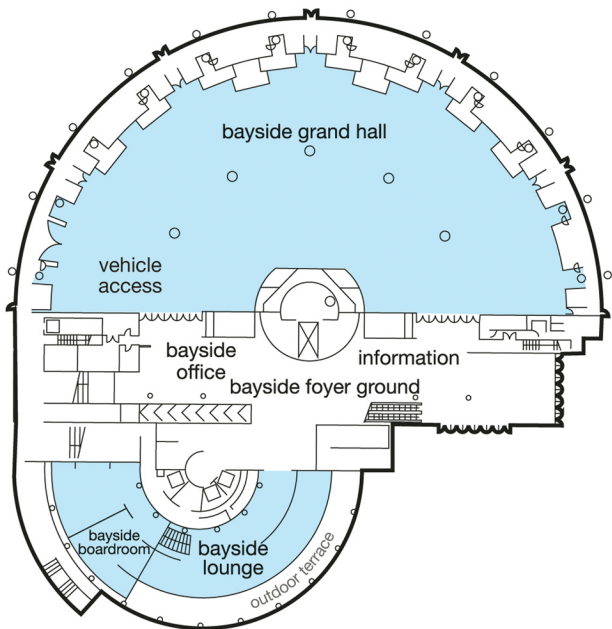
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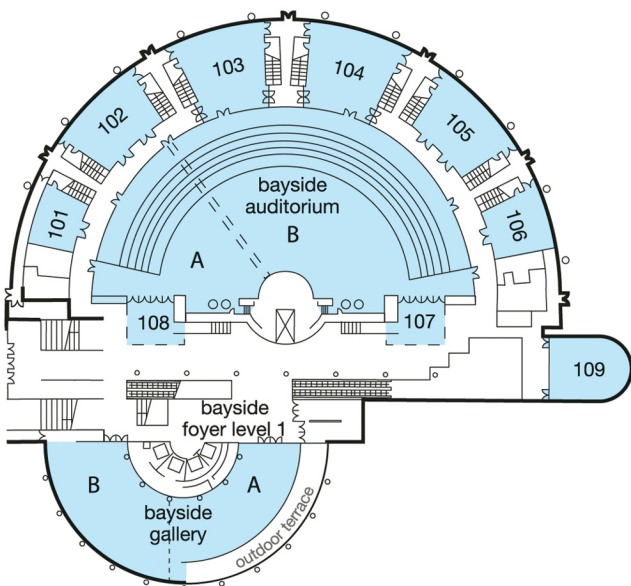
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convention centre bayside – level 1

