



## **UUST09 Final Agenda**

**Sunday August 23<sup>rd</sup> 2009**

**Tutorial: 1:00PM -6:00PM**

**Registration: New England Center Lobby: 6:00PM -9:00PM**

Hosted by:  
Autonomous Undersea Systems Institute  
86 Old Concord Turnpike  
Lee, NH 03861  
(603) 868-3221  
[www.ausi.org](http://www.ausi.org)

Monday August 24<sup>th</sup> 2009 – Registration begins at 7:30 in the New  
England Center Lobby

**Berkshire Room**

**Control A**

- 8:30 -  
9:00 **Preference Chart Based Obstacle Avoidance Mechanism for Mission Oriented Operating Suite (MOOS)** - R.Vishen & Dr. R.Balasubramanian & University Mass -Dartmouth, MA USA
- 9:00 -  
9:30 **A MOOS Module for Monitoring Energy Usage of Autonomous Vehicles** - A. Kanago, J.Frenzel, D. Edwards University of Idaho, USA
- 9:30 -  
10:00 **An Online AUV Trajectory Re-planning Software Architecture Based on the MOOS** - Matko Barisic\* Sean P. Kragelund \*\*Theodore D. Masek \*\*Zoran Vukic \*\* University of Zagreb, Croatia\*\* Naval Postgraduate School Monterey, CA,USA

Break

**Control C**

- 10:30 -  
11:00 **A Micro-UUV Testbed for Bio-Inspired Motion Coordination** - N.Sydney\*, S.Napora, S. Beal, P.Mohl, P. Nolan, S.Sherman, A. Leishman, Sachit Butail, University of Maryland, College Park, USA
- 11:00 -  
11:30 **Optimal Path Planning for AUVs in Time-Varying Ocean Flows** - M.Eichhorn - National Research Council Canada
- 11:30 -  
12:00 **Highly Accurate Horizontal Motion Control for an Omni-Directional** - H.Choi, K.Kim, and S.Kim, Korea Ocean Research and Development Institute, Korea
- 12:00 -  
12:30 **Improving the Coordination Efficiency of Multiple AUV Operations Using Prediction of Intent** – C. Sotzing & D. Lane Heriot-Watt University, UK

Lunch

**Multiple AUVs A**

- 1:30 -  
2:00 **Cooperative MCM for Heterogeneous UUV Optimized in Constrained Time** - R. Prins Penn. State University, USA
- 2:00 -  
2:30 **An Experimental Control Architecture for Cooperation Among a Team of AUVs** –A. Packer, Dr.R. Balasubramanian, UMASS Dartmouth C.Duarte & Gerald Martel – NUWC, USA
- 2:30 -  
3:00 **Onboard Adaptive Control of AUVs using Automated Planning and Execution** - K. Rajan, F.Py, C.McGann, J. Ryan, T. O'Reilly,Hans T., Brent Roman, T.Maughan Monterey Bay Aquarium Research Institute ,California USA

Break

**Multiple AUVs B**

- 3:30 -  
4:00 **Assigning Closely Spaced Targets to Multiple Autonomous Underwater Vehicles** - Beverley Chow& Jan P. Huissoon University of WaterlooWaterloo, Canada & C. Michael Clark California Polytechnic State University, CA, USA
- 4:00 -  
4:30 **Using Language-Centered Intelligence to Optimize Mine-like Object Inspections for a Fleet of Autonomous Underwater Vehicles** - N. J. Hallin, B. L. Johnson, H. N. Egbo, P. L. Ray, M. O'Rourke, J. F. Frenzel, T. Soule, D. B. Edwards, Center for Intelligent Systems Research, University of Idaho
- 4:30 -  
5:00 **A C3L Compiler for Generating Parallelized Plans for Collaborative Multi-asset Undersea Missions** - J.Sustersic & Shashi Phoha Pennsylvania State University, USA

**Great Bay Room**

**Sensor A**

- 8:30 -  
9:00 **Development and Application of Distributed MEMS Pressure Sensor Array for AUV Object Avoidance** - V. I. Fernandez, S.M. Hou, F.S. Hover, J.Lang, M.S. Triantafyllou , MIT, USA
- 9:00 -  
9:30 **Some algorithms for small AUV docking based on visual data** - A.Ph. Scherbatyuk, A.A. Kushnerik, A.V. Vorontso, IMTP FEB RAS, Russia
- 9:30 -  
10:00 **Vision-based Frozen Surface Egress: A Docking Algorithm for the ENDURANCE AUV** - A.Murarka, G. Kuhlmann & Shilpa Gulati, The University of Texas at Austin, USA
- 10:00 -  
10:30 Break

**Special Topics**

- 10:30 -  
11:00 **Results of Expert Judgments on the Faults and Risks with Autosub3 and an Analysis of its Campaign to Pine Island Bay, Antarctica, 2009** - M. Brito & G. Griffiths National Oceanography Centre, Southampton Southampton, UK
- 11:00 -  
11:30 **Reliability of two REMUS-100 AUVs based on fault log analysis and elicited expert judgment** - G.Griffiths<sup>1</sup>, M.Brito<sup>1</sup>, I. Robbins<sup>2</sup> and M. Moline<sup>2</sup><sup>1</sup> National Oceanography Centre, Southampton, UK & <sup>2</sup> California Polytechnic State University, CA, USA
- 11:30 -  
12:00 **Exploring the Mid Ocean Ridge and Seamounts with the Autonomous Benthic Explorer, 1995-2008** - Dana R. Yoerger A.M. Bradley,B. B. Walden, M. V. Jakuba,R. Catanach, A.Duester, A.Billings WHOI, Woods Hole, MA, USA
- 12:00 -  
12:30 **Towards Selection of a Propulsion Method for a Long Range Benthic Imaging AUV** - D.Steinberg, A. Bender, A. Friedman, University of Sydney, Australia

Lunch

**Sensor B**

- 1:30 -  
2:00 **AUV/ROV Pose and Shape Estimation of Tethered Targets Without Fiducials** - S. Augenstein & S. Rock Stanford University, CA USA
- 2:00 -  
2:30 **Sharing Clearance Data Between Multiple Autonomous Platforms** - D. Meyer, J. Frenzel, D. Edwards, Univ. of Idaho, USA
- 2:30 -  
3:00 **Performing Visual Surveys of Non-Planar Benthic Terrain** - K. Murthy\* & S.Rock\*\*, \*Stanford University, CAUSA, \*\*MBARI USA
- 3:00 -  
3:30 Break

**Sensor B**

- 3:30 -  
4:00 **Adaptive Sampling in Robotic Sensor Networks for Environmental Robotics** - V. K. Hombal1, A.C. Sanderson1, & D. R. Blidberg2 <sup>1</sup>Rensselaer Polytechnic Institute Troy, NY USA, <sup>2</sup> AUSI Lee, NH USA
- 4:00 -  
4:30 **Physical Computing for In-situ Adaptive Control of Collaborative Undersea Networks** - S. Phoha Pennsylvania State University, PA, USA
- 4:30 -  
5:00 **Gatekeeper: An Untethered, Persistent, Station-Keeping Buoy** – S. DaSilva FSI, MA , J. Cleland Mil3, Inc NC, S. Chappell AUSI, NH, M. Graves VCT, VA - USA

\*Busses Leave the New England Center at 5:30 for the PYC Reception

**Tuesday August 25<sup>th</sup> 2009 – Registration begins at 8:00 AM in the Great Bay Room Lobby**

**Berkshire Room**

8:30 - 9:00	<b>Control B</b> <b>Facilitation of Autonomous Vehicle Coordination through an XML-Based Vehicle-Independent Control Architecture</b> – D.Davis, D.Brutzman and B. Becker Naval Post Graduate School, CA, USA
9:00 - 9:30	<b>Acquisition of Complete Video Mosaics by an AUV - Cédric De Césaire</b> and M. Rendas Laboratoire I3S, CNRS-UNSA, France
9:30 - 10:00	<b>Design and Control of a Flight-Style AUV with Hovering Capability</b> - J. Liu <sup>1</sup> , M. E. Furlong <sup>2</sup> , S. M. Sharkh <sup>1</sup> , A. Palmer <sup>1</sup> , A. B. Philips <sup>1</sup> , S. R. Turnock <sup>1</sup> , <sup>1</sup> University of Southampton Southampton, UK <sup>2</sup> National Oceanography Centre, , Southampton, UK
10:00-10:30	Break
10:30 - 11:00	<b>Control C</b> <b>Efficient Guidance and Control for Underwater Gliders</b> – N. Mahmoudian & C.A. Woolsey Virginia Polytechnic Institute & State University, USA
11:00 - 11:30	<b>Dynamic Control Capabilities and Developments of the Bluefin Robotics AUV Fleet</b> – Robert Panish, Bluefin Robotics, USA
11:30 - 12:00	<b>Turn Optimization for a Biomimetic Underwater Vehicle-</b> N. Plamondon & M. Nahon McGill University, Canada
12:00-12:30	<b>Situation-aware mission planning using distributed service oriented agents in autonomous underwater vehicles</b> – Patron & Lane
12:30-1:30	Lunch
1:30 - 2:00	<b>Navigation A</b> <b>An Analytical Framework for Predicting the Performance of Autonomous Underwater Vehicle Positioning</b> - Brian Bingham, University of Hawai'i–Manoa USA
2:00 - 2:30	<b>In Situ Acoustic Multipath Identification for the Augmentation of Long Baseline Autonomous Underwater Vehicle Navigation</b> - Cara E.G. LaPointe and Dana R. Yoerger, Woods Hole Oceanographic Institution, USA
2:30 - 3:00	<b>Implementation of precise underwater navigation for photo mosaic</b> - Kihun Kim, Hyun-Taek Choi, Sea-Moon Kim and Pan-Mook Lee, Korea Ocean Research and Development Institute, Korea
3:00-3:30	Break
3:30 - 4:00	30 year summaries
4:00 - 4:30	30 year summaries
4:30 - 5:00	30 year summaries

**Great Bay Room**

8:30 - 9:00	<b>Systems A</b> <b>Hovering Autonomous Underwater Vehicle – System Design</b> - J.Vaganay, L.Gurfinkel, M. Elkins, D. Jankins, K.Shurn, Bluefin Robotics Corporation, USA
9:00 - 9:30	<b>Design &amp; Performance of Odyssey IV: A Deep Ocean Hover-Capable AUV.</b> - J,G. Eskesen, D,Owens, M,Soroka, F. S. Hover, J. Pederson, MIT Sea Grant, MA USA
9:30 - 10:00	<b>Development and Demonstration of a Light Fiber Tether Management System</b> – B,Fletcher, C,Young, J,Buescher Space and Naval Warfare Systems Center – Pacific USA, A,Bowen, R,McCabe, Dr. D,Yoerger Woods Hole Oceanographic Institution, USA, Dr. L. L. Whitcomb, Johns Hopkins University, USA
10:00-10:30	Break
10:30 - 11:00	<b>Sensor A</b> <b>3D Flow field PIV and biological sensing using synthetic aperture</b> - T.T. Truscott, J. Belden and A.H. Techet, Massachusetts Institute of Technology, Cambridge, MA USA
11:00 - 11:30	<b>A New Collision Avoidance System for the Autosub6000 Autonomous Underwater Vehicle</b> – M.Furlong, S.McPhai, M. Pebody, National Oceanography Centre, Southampton, UK
11:30 - 12:00	<b>Dynamically Focused Side Scan Sonar – Goes Down Easy on an AUV</b> - Steven Wright EdgeTech FL USA
12:00 - 12:30	<b>3D Reconstruction with an AUV-Mounted Forward-Looking Sonar</b> – D.Horner & N. McChesney Naval Postgraduate School, CA USA
12:30-1:30	Lunch
1:30 - 2:00	<b>Systems B</b> <b>Sub-Ice Exploration of West Lake Bonney:ENDURANCE 2008 Mission</b> - W.C. Stone <sup>1</sup> ,B. Hogan,C. Flesher, S. Gulati, K. Richmond, A.Murarka, G.Kuhlman, M. Sridharan P.Doran <sup>2</sup> ,J. Priscu <sup>3</sup> , <sup>1</sup> Stone Aerospace, TX, USA, <sup>2</sup> University of Illinois Chicago, USA <sup>3</sup> University of Montana, USA
2:00 - 2:30	<b>Navigation, Control, and Recovery of the ENDURANCE Under-Ice Hovering AUV</b> – K.Richmond, S. Gulati, C.Flesher, B.Hogan, W.Stone, Stone Aerospace, TX, USA
2:30 - 3:00	<b>Development of a Sub-Ice Automated Profiling System for Antarctic Lake Deployment</b> – B.P. Hogan, C. F.William C. Stone, Stone Aerospace, TX, USA
3:00-3:30	Break
3:30 - 4:00	30 year summaries
4:00 - 4:30	30 year summaries
4:30 - 5:00	30 year summaries

**Busses begin leaving The New England Center at 5:30 for the Lobster banquet**

**Wednesday August 26<sup>th</sup> 2009 Registration begins at 8:00 AM in the  
Great Bay Room Lobby**

**Berkshire Room**

**Navigation B**

8:30 - 9:00     **Sonar-Based Iceberg-Relative AUV Localization** - P.Kimball\* & S.Rock\*\*, \*Stanford University, CA USA & \*\*Monterey Bay Aquarium Research Institute, CA USA

9:00 - 9:30     **AUV Terrain Relative Navigation Using Coarse Maps** - D. K. Meduna\*, S.M. Rock\* \*\*, & R. McEwen\*\*, \*Stanford University, CA, USA \*\*Monterey Bay Aquarium Research Institute, CA USA

9:30 - 10:00     **The Malta Cistern Mapping Project: Expedition II** - C.M. Clark - Cal. Polytechnic State University, CA USA & Timmy Gambin AURORA Special Purpose Trust

10:00-10:30     Break

**Hydrodynamics**

10:30 - 11:00     **Hybrid Glider Propulsion Module Implementation and Characterization** - B. Claus Memorial University of Newfoundland, Canada

11:00 - 11:30     **Optimal Underwater Glider Trajectories in Depth-Varying Currents** – R. J. Kraus, C.Woolsey, and E. C. Cliff, Virginia Tech, USA

11:30 - 12:00     **Towards Amphibious Robots: Asymmetric Flapping Foil Motion Underwater Produces Large Thrust Efficiently** - S.Licht, M. Wibawa, F.Hover, and M. Triantafyllou Massachusetts Institute of Technology, USA

12:00 – 1:30     Lunch

**Control & Hydrodynamics**

1:30 - 2:00     **Sensor Data Fusion and Submerged Test Results of a Pectoral Fin Propelled UUV** - J. D. Geder<sup>1</sup>, R.Ramamurti<sup>1</sup>, M.Pruessner<sup>2</sup>, B.Ratna<sup>2</sup>, and W. C. Sandberg<sup>1,2</sup> Naval Research Laboratory, Washington, DC USA <sup>3</sup> Science Applications International Corporation VA USA

2:00 - 2:30     **Perception, Stability Analysis, and Motion Planning for Autonomous Ship Hull Inspection** - B. Englot and F.Hover MIT, MA, USA

2:30 - 3:00

Summary Session

**Great Bay Room**

**Systems C**

8:30 - 9:00     **Preliminary Testing of the Prototype SQX-1** - D. Shea<sup>1</sup>, R.Bachmayer<sup>2</sup>, N. P. Riggs<sup>1</sup>, C. Williams<sup>3</sup> <sup>1</sup>Marport Deep Sea Technologies Inc. <sup>2</sup>Faculty of Engineering and Applied Sciences <sup>3</sup>Institute for Ocean Technology Memorial University of Newfoundland, National Research Council Canada, Canada

9:00 - 9:30     **Slocum Glider Extending the Endurance** – C. Jones, Teledyne Webb Research, MA, USA

9:30 - 10:00

10:00-10:30     Break

**Systems C - Mission Planning**

10:30 - 11:00     **An Advanced Unmanned Semi-Submersible Vehicle** - P. Alleman, Chief Scientist, C & C Technologies, Inc., LA USA

11:00 - 11:30     **The AUV 62-MR – using on-board Synthetic Aperture Sonar Processing** - B. Lövgren M.Sc. Saab Underwater Systems AB, Sweden

11:30 - 12:00     **Organizational Strategies for Informed Commitment in a Reactive Mission Planner** - E.Albert University of Maine, USA

12:00 - 12:30     **A Cooperative Architecture for Target Localization with Underwater Vehicles** - A. Belbachir, F. Ingrand, S.Lacroix, CNRS ; LAAS, Toulouse, France

12:30-1:30     Lunch

**Mission Planning**

1:30 - 2:00     **Simulations of an Iterative Glider Mission Planning Procedure for Flying into Strong Ocean Currents** - M. He<sup>1</sup>, C.Williams<sup>1</sup>, R.Bachmayer<sup>2 1</sup> Institute for Ocean Technology, National Research Council Canada , <sup>2</sup> Memorial University of Newfoundland, Canada

2:00 - 2:30     **Self localization method of an underwater vehicle around support legs of on-water platforms** - T. Maki\*, H. Mizushima\*\*, T. Ura\*,T. Sakamaki\* and M.Yanagisawa\*\*, \* The University of Tokyo, Japan \*\* Waseda University, Tokyo, Japan

2:30 - 3:00

Summary Session