



UUST09 Preliminary Agenda

Sunday August 23rd 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

**Monday August 24th 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) - Rahul Vishen & Dr. Ramprasad Balasubramanian & University Mass -Dartmouth, MA USA
- 9:00 - 9:30 A MOOS Module for Monitoring Energy Usage of Autonomous Vehicles - Anthony Kanago, James Frenzel, Dean 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

Control C

- 10:30 - 11:00 A Micro-UUV Testbed for Bio-Inspired Motion Coordination (student) - Nitin Sydney*, Seth Napora, Sarah Beal, Patrick Mohl, Patrick Nolan, Steve Sherman, Alexander Leishman, Sachit Butail, University of Maryland, College Park, USA
- 11:00 - 11:30 Optimal Path Planning for AUVs in Time-Varying Ocean Flows - Mike Eichhorn - National Research Council Canada
- 11:30 - 12:00 Highly Accurate Horizontal Motion Control for an Omni-Directional - Hyun-Taek Choi, Kihun Kim, and Sea-Mon Kim, Korea Ocean Research and Development Institute, Korea
- 12:00 - 12:30 Design of a Passively Falling Autonomous Underwater Vehicle - Charles Ambler and Franz Hover –MIT USA

Multiple AUVs A

- 1:30 - 2:00 Cooperative MCM for Heterogeneous UUV Optimized in Constrained Time - Ryan Prins Pennsylvania State University, USA
- 2:00 - 2:30 An Experimental Control Architecture for Cooperation Among a Team of AUVs - Rahul Vishen & Dr. Ramprasad Balasubramanian University of Massachusetts Dartmouth, Dartmouth, MA, USA
- 2:30 - 3:00 A Cooperative Architecture for Target Localization with Underwater Vehicles - Assia Belbachir, F'elix Ingrand, Simon Lacroix, CNRS ; LAAS, Toulouse, France

Multiple AUVs B

- 3:30 - 4:00 Assigning Closely Spaced Targets to Multiple Autonomous Underwater Vehicles - Beverley Chow & Jan Paul Huissoon University of Waterloo Waterloo, Canada and Christopher Michael Clark California Polytechnic State University, CA, USA
- 4:00 - 4:30 Simulating Human Reasoning in Mine-Like Object Inspection Assignments for a Fleet of Unmanned Underwater Vehicles - Nicodemus Hallin, Benjamin Johnson, Henry Egbo, Michael O'Rourke, Terence Soule, Dean Edwards, University of Idaho, Moscow, USA
- 4:30 - 5:00 A C3L Compiler for Generating Parallelized Plans for Collaborative Multi-asset Undersea Missions - John Sustersic and 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 - Vicente I. Fernandez, Stephen M. Hou, Franz S. Hover, Jeffrey H. Lang, Michael 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 - Aniket Murarka, Gregory Kuhlmann & Shilpa Gulati, The University of Texas at Austin, USA

Special Topics

- 10:30 - 11:00 Reliability of two REMUS-100 AUVs based on fault log analysis and elicited expert judgment - Gwyn Griffiths¹, Mario Brito¹, Ian Robbins² and Mark Moline^{2,1} National Oceanography Centre, Southampton, UK & ²California Polytechnic State University, CA, USA
- 11:00 - 11:30 Results of Expert Judgments on the Faults and Risks with Autosub3 and an Analysis of its Campaign to Pine Island Bay, Antarctica, 2009 - National Oceanography Centre, Southampton Southampton, UK
- 11:30 - 12:00 Exploring the Mid Ocean Ridge and Seamounts with the Autonomous Benthic Explorer, 1995-2008 - Dana R. Yoerger Albert M. Bradley, Barrie B. Walden, Michael V. Jakuba, Rodney Catanach, Alan Duester, Andrew Billings Woods Hole Oceanographic Institution, Woods Hole, MA, USA
- 12:00 - 12:30 Towards Selection of a Propulsion Method for a Long Range Benthic Imaging AUV (student) - Daniel Steinberg, Asher Bender, Ariell Friedman, University of Sydney, Australia

Sensor B

- 1:30 - 2:00 AUV/ROV Position Estimation of Tethered Targets without Fiducials - Sean Augenstein & Stephen Rock Stanford University, CA USA
- 2:00 - 2:30 Sharing Clearance Data Between Multiple Autonomous Platforms - Daniel Meyer, James Frenzel, Dean Edwards, University of Idaho, USA
- 2:30 - 3:00 Benthic Video Mosaicking of Non-Planar Terrain - Kiran Murthy* and Stephen Rock**, *Stanford University, CAUSA, **Monterey Bay Aquarium Research Institute CA USA

Sensor B

- 3:30 - 4:00 Multiresolution Adaptive Sampling in Robotic Sensor Networks - Vadiraj K. Hombal¹, Arthur C. Sanderson¹, and D. Richard Blidberg² ¹Rensselaer Polytechnic Institute Troy, NY USA , ²Autonomous Undersea Systems Institute Lee, NH USA
- 4:00 - 4:30 Physical Computing for In-situ Adaptive Control of Collaborative Undersea Networks - Shashi Phoha Pennsylvania State University, PA, USA
- 4:30 - 5:00 Sensor Model for Sea Bottom/Acoustic-based SLAM - Adrien Barral, Maria-João Rendas Laboratoire I3S, CNRS-UNSA, France

Busses Leave the New England Center at 5:30 for the Portsmouth
Yacht Club Reception

Tuesday August 25th, 2009
Registration begins at 7:30AM in the Great Bay Lobby

Berkshire Room

Control B

8:30 - 9:00 Facilitation of Autonomous Vehicle Coordination through an XML-Based Vehicle-Independent Control Architecture - Duane Davis, Don Brutzman and Bill Becker Naval Postgraduate School, CA, USA

9:00 - 9:30 Acquisition of Complete Video Mosaics by an AUV - Cédric De Césaire and Maria-João Rendas Laboratoire I3S, CNRS-UNSA, France

9:30 - 10:00 Design and Control of a Flight-Style AUV with Hovering Capability - J. Liu¹, M. E. Furlong², S. M. Sharkh¹, A. Palmer¹, A. B. Philips¹, S. R. Turnock¹, ¹University of Southampton Southampton, UK ²National Oceanography Centre, Southampton, UK

Control C

10:30 - 11:00 Efficient Guidance and Control for Underwater Gliders - Nina Mahmoudian & Craig A. Woolsey Virginia Polytechnic Institute & State University, USA

11:00 - 11:30 Dynamic Control Capabilities and Developments of the Bluefin Robotics AUV Fleet – Robert Panish, Bluefin Robotics, USA

11:30 - 12:00 Maneuver Optimization With a Biomimetic Underwater Vehicle - N. Plamondon & M. Nahon McGill University, Canada

12:00 - 12:30 Depth Control for an underwater biomimetic vehicle - N. Plamondon & M. Nahon McGill University, Canada

Navigation A

1:30 - 2:00 An Analytical Framework for Predicting the Performance of Autonomous Underwater Vehicle Positioning - Brian Bingham, University of Hawai'i–Manoa USA

2:00 - 2:30 In Situ Acoustic Multipath Identification for the Augmentation of Long Baseline Autonomous Underwater Vehicle Navigation - Cara E.G. LaPointe and Dana R. Yoerger, Woods Hole Oceanographic Institution, USA

2:30 - 3:00 Implementation of precise underwater navigation for photo mosaic - Kihun Kim, Hyun-Taek Choi, Sea-Moon Kim and Pan-Mook Lee, Korea Ocean Research and Development Institute, Korea

30 year summaries

3:30 - 4:00 30 year summaries

4:00 - 4:30 30 year summaries

4:30 - 5:00 30 year summaries

Great Bay Room

Systems A

8:30 - 9:00 Hovering Autonomous Underwater Vehicle – System Design - Jerome Vaganay, Leo Gurfinkel, Mike Elkins, Dan Jankins, Kim Shurn, Bluefin Robotics Corporation, USA

9:00 - 9:30 Design & Performance of Odyssey IV: A Deep Ocean Hover-Capable AUV. - Justin G. Eskesen, Dylan Owens, Michael Soroka, Franz S. Hover, Judith Pederson, MIT Sea Grant, MA USA

9:30 - 10:00 Development and Demonstration of a Light Fiber Tether Management System - Barbara Fletcher, Chris Young, James Buescher Space and Naval Warfare Systems Center – Pacific USA, Andrew Bowen, Robert McCabe, Dr. Dana Yoerger Woods Hole Oceanographic Institution, USA, Dr. Louis L. Whitcomb, Johns Hopkins University, USA

Sensor A

10:30 - 11:00 3D Flow field PIV and biological sensing using synthetic aperture - T.T. Truscott, J. Belden and A.H. Techet, Massachusetts Institute of Technology, Cambridge, MA USA

11:00 - 11:30 Collision Avoidance for Low Altitude Bathymetric and Photographic Surveys with the Autosub6000 Autonomous Underwater Vehicle - Maaten Furlong, Stephen McPhai, Miles Pebody, National Oceanography Centre, Southampton, UK

11:30 - 12:00 Dynamically Focused Side Scan Sonar – Goes Down Easy on an AUV - Steven Wright EdgeTech FL USA

12:00 - 12:30 3D Reconstruction Using a Forward-Looking Sonar - Douglas Horner & Nevin McChesney Naval Postgraduate School, Monterey, CA USA

Systems B

1:30 - 2:00 Navigation, Control, and Recovery of the ENDURANCE Under-Ice Hovering AUV - Kristof Richmond, Shilpa Gulati, Chris Flesher, Bart Hogan, William Stone, Stone Aerospace, TX, USA

2:00 - 2:30 Development of a Sub-Ice Automated Profiling System for Antarctic Lake Deployment - Bartholomew P. Hogan, Christopher Flesher, William C. Stone, Stone Aerospace, TX, USA

2:30 - 3:00 Sub-Ice Exploration of West Lake Bonney:ENDURANCE 2008 Mission - William C. Stone¹, Bartholomew Hogan, Christopher Flesher, Shilpa Gulati, Kristof Richmond, Aniket Murarka, Greg Kuhlman, Mohan Sridharan Peter Doran², John Priscu³, Stone Aerospace, TX, USA, ²University of Illinois Chicago, USA ³ University of Montana, USA

30 year summaries

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 bake

Wednesday August 26th, 2009 Registration begins at 8:00AM in the Great Bay Lobby

Berkshire Room

Navigation B

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

AUV Terrain Relative Navigation Using Coarse Maps

9:00 - 9:30 - Deborah K. Meduna*, Stephen M. Rock* **, and Rob McEwen**, *Stanford University, CA, USA **Monterey Bay Aquarium Research Institute, CA USA

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

Control & Hydrodynamics

10:30 - 11:00 Hybrid Glider Propulsion Module Implementation and Characterization (student) - Brian Claus
Memorial University of Newfoundland, Canada

11:00 - 11:30 Longitudinal Stability of a Supercavitating Vehicle - John Dzielski Stephens Institute of Technology, MIT, USA

11:30 - 12:00 Optimal Underwater Glider Trajectories in Depth-Varying Currents - Robert J. Kraus, Craig Woolsey, and Eugene C. Cliff, Virginia Tech, USA

12:00 - 12:30 Towards Amphibious Robots: Asymmetric Flapping Foil Motion Underwater Produces Large Thrust Efficiently - Stephen Licht, Martin Wibawa, Franz Hover, and Michael Triantafyllou Massachusetts Institute of Technology, USA

Control & Hydrodynamics

1:30 - 2:00 Sensor Data Fusion and Submerged Test Results of a Pectoral Fin Propelled UUV - Jason D. Geder¹, Ravi Ramamurti¹, Marius Pruessner², Banahalli Ratna², and William C. Sandberg³, ^{1,2} Naval Research Laboratory, Washington, DC USA ³ Science Applications International Corporation VA USA

2:00 - 2:30 Stability and Robustness Analysis Tools for Marine Robot Localization and SLAM Applications - Brendan Englot and Franz 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 - David Shea¹, Ralf Bachmayer², Neil P. Riggs¹, Christopher Williams³
¹Marport Deep Sea Technologies Inc. ²Faculty of Engineering and Applied Sciences ³Institute for Ocean Technology Memorial University of Newfoundland, National Research Council Canada, Canada

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

9:30 - 10:00 A Novel Amphibian Solution for Aquatic Monitoring Robots - Liang Ju¹, Gabriele Ferri², Barbara Mazzolai², Cecilia Laschi¹, and Paolo Dario^{1,2}
¹ARTS Laboratory, (Pisa), Italy ²CRIM Laboratory (Pisa), Italy

Systems C - Mission Planning

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

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

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

12:00 - 12:30 Onboard Adaptive Control of AUVs using Automated Planning and Execution - Kanna Rajan, Frederic Py, Conor McGann¹, John Ryan, Tom O'Reilly, Hans Thomas, Brent Roman, Thom Maughan Monterey Bay Aquarium Research Institute, California USA

Mission Planning

1:30 - 2:00 Simulations of an Iterative Glider Mission Planning Procedure for Flying into Strong Ocean Currents - Moqin He¹, Christopher Williams¹, Ralf Bachmayer²
¹Institute for Ocean Technology, National Research Council Canada ² Memorial University of Newfoundland, Canada

2:00 - 2:30 Self localization method of an underwater vehicle around support legs of on-water platforms - Toshihiro Maki*, Hayato Mizushima**, Tamaki Ura*, Takashi Sakamaki* and Masao Yanagisawa**, * The University of Tokyo, Japan ** Waseda University, Tokyo, Japan

2:30 - 3:00

Summary Session