AUVSI's Unmanned Systems North America 2008
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Honeywell Unmanned Aircraft System Solutions

Conference Program

Tuesday, June 10, 2008

8:00 a.m. – 12:00 noon Opening Plenary Session

Wednesday, June 11, 2008

8:00 a.m. – 4:00 p.m. Poster Presentations

9:30 – 11:30 a.m. Oral Presentations

Four concurrent tracks as follows: (1) Air Vehicle Operations, (2) Cross-Platform Communication, (3) Ground Vehicle Missions I and (4) Maritime Autonomy

1:00 – 3:00 p.m. Oral Presentations

Four concurrent tracks as follows: (1) Air Vehicle Control I, (2) Air Vehicle Operations II, (3) Cross-Platform Autonomy and (4) Ground Vehicle Missions II

4:00 – 5:30 p.m. Oral Presentations

Four concurrent tracks as follows: (1) Air and Cross-Platform Control, (2) Air Vehicle Operations III, (3) Air Vehicle Power and Propulsion and (4) Ground Vehicle Payloads

Thursday, June 12, 2008

8:00 a.m. – 2:00 p.m. Poster Presentations

9:30 – 11:30 a.m. Oral Presentations

Four concurrent tracks as follows: (1) Air Vehicle Air-Space Control, (2) Air Vehicle Civil Applications I, (3) Ground Vehicle Navigation and (4) Maritime Missions

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Tuesday, June 10
8:00 – 12:00 noon
Opening Plenary Session

8:00 a.m. – 12:00 noon — Opening Plenary Session

Mr. Chris Anderson, Editor, Wired Magazine; Creator, DIYDrones.com; and Author, The Long Tail
RADM Michael Bachmann, USN, COMSPAWARSYSCOM, Space and Naval Warfare Systems Command
(no presentation available)
Maj Gen Michael Kostelnik, USAF (Ret.), Assistant Commissioner, Office of Customs and Border Protection Air and Marine, U.S. Department of Homeland Security (no presentation) (no presentation available)
Brig Gen Thomas Andersen, USAF, Director of Plans and Programs (A5), Headquarters, Air Combat Command
Dr. Nady Boules, Director, Electrical & Controls Integration Lab, GM Research & Development, General Motors
(no presentation available)
Mr. Doug Davis, Manager, Unmanned Aircraft Program Office, Federal Aviation Administration
LTC Steven Noe, USA, Product Manager, Future Combat Systems, Unmanned Ground Systems; and **Mr. Richard Fisher**, Deputy Product Manager, Future Force Unmanned Aircraft Systems
LtGen Friedrich Ploeger, DEU AF, Executive Director, NATO Joint Air Power Competence Centre

Wednesday, June 11
8:00 – 4:00 p.m.
Poster Presentations

PLUS
Patrick Marshall, AFRL/RYAT, Matt VanBaren, Dr. John Wood and Dr. Dan Jensen, US Air Force Academy

Real Time Mission Monitor: A Situational Awareness Tool for Conducting Airborne Field Experiments
Dr. Richard Blakeslee and Michael Goodman, NASA Marshall Space Flight Center, John Hall, Philip Parker and Yubin He, University of Alabama Huntsville

Algorithm Acceleration Across Heterogeneous Processing Element
Alan Commike, Quantum3D

Network-Centric Positioning Technology for Interoperable Unmanned Vehicle Systems
Dr. Jeff Fayman and Dr. Lydia Bock, Geodetics, Inc.

Precision Engagement with Unmanned Air Systems in Complex Urban Air Flows
Dr. Bohdan Cybyk, David Drewry, Timothy Frey and Jack Keane, Johns Hopkins University Applied Physics Laboratory

Accurate Trajectory Tracking for Land Vehicles Using Novel Nonlinear Controller
Vladimir Djapic, SPAWAR Systems Center San Diego, and Dr. Jay Farrell, University of California, Riverside

Countering the Maritime Threat Using Autonomous Systems
Jonathan Pethen, John Morrison and Steve Ray, QinetiQ

An Overview of the NASA SIERRA UAS
Matthew Fladeland, Randy Berthold, Steve Dunagan and Jim Brass, NASA Ames Research Center, Geoff Bland, NASA Wallops Flight Facility, and Lesli Monforton, Naval Research Laboratory

Model-Based Design Workflow for Large Safety-Critical Systems: A Discussion Regarding Model Architecture
Mike Anthony and Jon Friedman, The MathWorks

Micro Air Vehicles that Perch: Concepts and Prototypes for MAVs with Low Energy Expenditure States
Dr. John Wood, Chris Perry, Jason Parcus, Brandon Hua, Dakota Olsen, Ken Pedersen, Capt Mike Anderson and Dr. Dan Jensen, US Air Force Academy

Architecting an Integrated Reconfigurable Application Platform for UXVs
Dr. Rajive Joshi, Real-Time Innovations, Inc.

Vision-guided Autonomous Quad-rotor Helicopter Flight Stabilization and Control
Dr. D. J. Lee, Spencer Fowers, Beau Tippetts and James Archibald, Brigham Young University

Collaboration for Multi-Vehicle Mission Planning
Dr. Michael Leen, OR Concepts Applied

Online Path Planning on a Sliding Fixed Size Fixed-Resolution Grid Map
Elizabeth Liao, Scott Niekum and Mark Ollis, Applied Perception, a Foster-Miller Company

Regulation of Unmanned Aircraft In Offshore and International Airspace Operations
Douglas Marshall and Benjamin Trapnell, University of North Dakota

Fast Jet Control of Multiple UAVs
Dr. Jon Platts, J.A. Kemsley and D. Richards, QinetiQ

Flight Simulator for UAV
Ing. Endri Rachman and Radzuan Razali, School of Aerospace Engineering - Universiti Sains Malaysia

Software for Effective Delivery of Net-Centric Information to UAV Operators
Jeff Collier, Dominic Bartek, John Miles and John Hudson, SYTRONICS, Inc.

Supplemental Information Displays (SIDs) in Uninhabited Air Vehicle (UAV) Ground Control Stations
Dr. William Marshak, Jeff Collier and John Reising, SYTRONICS, Inc. and Michael J. Findler, SYTRONICS, Inc. and Wright State Research Institute

Weaponized Unmanned Surface Vessel for Anti-Submarine Warfare
David Toth, Naval Undersea Warfare Center

A Real-time Electro-Optical Sensor System Simulator for UAV Sense and Avoid Development
Leo Wong, Atul A. Phadnis, Omid Shakernia and Won-Zon Chen, Northrop Grumman Corporation, and Bonnie Schwartz, Air Force Research Laboratory

Wednesday, June 11
Oral Presentations
9:30 - 11:30 a.m.

Four concurrent tracks as follows: (1) Air Vehicle Operations, (2) Cross-Platform Communication, (3) Ground Vehicle Missions I and (4) Maritime Autonomy

Air Vehicle Operations

9:30 – 10:00	**Opening The Airspace For UAVs** Nigel Mills, QinetiQ, Maureen Mccue, BAE Systems, Nick Miller, Thales, Richard Bourne, FRL, Gary Clayton, EADS, Mark Jefferies, Rolls-Royce and Dr. Andrew Lucas, Agent Oriented Software
10:00 – 10:30 a.m.	**Army UAS Systems: Technology that is Shaping the Future of Modern Warfare** (not available for posting) COL Donald Hazelwood, UAS Project Office
10:30 – 11:00 a.m.	**Broad Area Maritime Surveillance** CAPT Robert Dishman, NAVAIR PMA-262
11:00 – 11:30 a.m.	**USMC and Shadow** Maj Kenneth Briggs, OPNAV N88, LtCol P.J. Kerr, APW-81 and Vic Wigfall, IPTL PMA 263, Lt Col Chris Patten, APW-81

Cross-Platform Communication

9:30 – 10:00 a.m.	**Achieving UAS Interoperability and Networking through Common Datalink Solutions** Richard Lober, Cubic Corporation
10:00 – 10:30 a.m.	
10:30 – 11:00 a.m.	**Wearable Control and Communications System for use with UAVs, UGVs and UGSs** Dr. Hagen Schempf, Todd Graham, Joseph Martin and George Skoptsov, CMU
11:00 – 11:30 a.m.	**Development of a Scalable Common Modular Control System for Air and Ground Unmanned Vehicles** Geoff Butler, Nigel Cox, Rex Helton, Greg McDermott, Andy McKenzie and Andy Wright, BAE Systems

Ground Vehicle Missions I

9:30 – 10:00 a.m.	**Use of the Lightweight Reconnaissance Vehicle (LRV) for Police Actions** David Timian, Andrew Poulter and Laurie McIntosh, ARA and Lt. Robert Evans, Vermont State Police
10:00 – 10:30 a.m.	**Modeling Environmental Uncertainty in Ground Robot Navigation** Ryan Meuth, Paul Robinette and David Wunsch, Missouri University of Science and Technology
10:30 – 11:00 a.m.	**Remote Operation of the Black Knight Unmanned Combat Vehicle** Jean-Sebastien Valois, John Bares and David P. Rice, National Robotics Engineering Center, Timothy J. Pasko, BAE Systems and Herman Herman, National Robotics Engineering Center
11:00 –	**Validating the Performance of an Autonomous Car**

11:30 a.m. Michael Clark, Carnegie Mellon-ISR, Dr. Chris Urmson and Robert Bittner, Carnegie Mellon, Robotics Institute, Dr. Sam Harbaugh, Integrated Software, Inc. and Bryan Salesky, National Robotics and Engineering Consortium

Maritime Autonomy

Intelligent Autonomy for Unmanned Sea Surface and Underwater Vehicles
9:30 – 10:00 a.m. Dr. Terry Huntsberger, Hrand Aghazarian, Andres Castano, Gail Woodward, Curtis Padgett and Dan Gaines, Jet Propulsion Laboratory, Christine Buzzell, Naval Undersea Warfare Center

Mission-Level Autonomy for Autonomous Undersea Vehicles
10:00 – 10:30 a.m. David Scheidt and Steve Marshall, JHU/APL, Dan Stilwell and Brian McCarter, Virginia Tech

MOOS and IvPHelm Approach to Autonomous Surface Vessels
10:30 – 11:00 a.m. Alon Yaari, SARA, Inc.

Sensors and Autonomy Development for the Autonomous Maritime Navigation (AMN) System
11:00 – 11:30 a.m. Les Elkins and Ping Zhuang, Spatial Integrated Systems, Inc., Terry Huntsberger and Hrand Aghazarian, NASA Jet Propulsion Laboratory, Steve Crawford, Technology Systems Incorporated, Reynolds Monach, Wagner Associates and Joe Fuller, Marshall University

Wednesday, June 11
Oral Presentations
1:00 - 3:00 p.m

Four concurrent tracks as follows: (1) Air Vehicle Control I, (2) Air Vehicle Operations II, (3) Cross-Platform Autonomy and (4) Ground Vehicle Missions II

Air Vehicle Control I

Sense and Avoid (SAA) Air Traffic Detection Sensor System III Demonstration
1:00 – 1:30 p.m. (not available for posting) Andrew White and Michael Deschenes, DRA and Dr. John McCalmont and Louis Chan, AFRL

Autonomous Terminal Area Operations Control of Unmanned Air Vehicles
1:30 – 2:00 p.m. Dr. Han Park and Michael Grage, Northrop Grumman Corporation, Crystal Wiedemann, Air Force Research Laboratory, Mark Micieli and Russell Wolfe, Modern Technology Solutions, Inc., and Chris Brinton, Mosaic ATM

From UAV System to System of UAV Systems
2:00 – 2:30 p.m. Eli Yitzhaki, Elbit Systems

Fractal Control Architecture for Multiple UAVs Missions
2:30 – 3:00 p.m. Anil Raj and Michelle Darrah, Institute for Human and Machine Cognition, Dr. Sergey Drakunov, Embry-Riddle Aeronautcal University

Air Vehicle Operations II

Predicting the Cost of Future UAV Systems
1:00 – 1:30 p.m. Mark Sferra, Todd White and Huat Ng, Wyle Labs, and Robert Altizer, Systems Planning and Analysis

1:30 – 2:00 p.m. **Canadian MALE UAS Operations - Lessons Learned**
Lori Guétré and Andrew Carryer, MDA

2:00 – 2:30 p.m. **ASTM International's Portfolio of Industry Consensus UAS Standards**
Jeff Goldfinger, L-3 Communications and ASTM Committee F38 Vice Chairman, Mike Howell, Northrop Grumman Corp. and ASTM Committee F38 Chairman, and James Jewell, UAV Marketspace and ASTM Committee F38 Membership Secretary

2:30 – 3:00 p.m. **The Use of Mission Systems Engineering in Developing a Capability Based Unmanned System**
Susan Brown, Raytheon Missile Systems

Cross-Platform Autonomy

1:00 – 1:30 p.m. **Measuring Software Complexity to Target Risky Modules in Autonomous Vehicle Systems**
Clark, Carnegie Mellon-ISR, Dr. Chris Urmson, Carnegie Mellon University Robotics Institute, Dale Brenneman, McCabe Software and Bryan Salesky, National Robotics and Engineering Consortium

1:30 – 2:00 p.m. **Autonomy Levels for Unmanned Systems (ALFUS) Framework** (not available for posting)
Hui-Min Huang, NIST, U.S. DOC

2:00 – 2:30 p.m. **Flight and In-Water Experiments of Autonomy and Human Interface Technologies with Multiple Unmanned Systems**
Marc Steinberg, Office of Naval Research

2:30 – 3:00 p.m. **A Metric Taxonomy for Human Supervisory Control of Unmanned Vehicles**
Dr. Mary Cummings, Patricia Pina and Jacob Crandall, MIT

Ground Vehicle Missions II

1:00 – 1:30 p.m. **Unmanned Vehicles in Land Warfare ISR**
Roy Peshin, Simlat UAV Training Solutions

1:30 – 2:00 p.m. **Sensor Technology and Unmanned Ground Vehicle (UGV) Operations, Lessons Learned from Urban Challenge**
Dr. Peter Drewes, Brian Satterfield and Heeten Choxi, Lockheed Martin

2:00 – 2:30 p.m. **Implementing an SAE J2735 DSRC and JAUS Capable Extra-Vehicle Communications System**
Michael Brown and Paul Avery, Southwest Research Institute

2:30 – 3:00 p.m. **Harmonizing UK and US Software Standards for Use in Unmanned Systems**
Luke Perkins, QinetiQ

Wednesday, June 11
Oral Presentations
4:00 - 5:30 p.m.

Four concurrent tracks as follows: (1) Air and Cross-Platform Control, (2) Air Vehicle Operations III, (3) Air Vehicle Power and Propulsion and (4) Ground Vehicle Payloads

Air Vehicle Control I

4:00 – 4:30 p.m. **Windows for Unmanned Aircraft Systems**
Andrew Kirschbaum and Bob Brown, D.P. Associates, Inc.

	Motive and Affect-based Robotic Control (MARC)
4:30 – 5:00 p.m.	Dr. Aaron A. Pepe, Ph.D., Wayne Zachary, Ph.D., Darius Miller and Vassil Iordanov, CHI Systems Incorporated, Lynn Miller, Ph.D. and Stephen Read, Ph.D., University of Southern California
5:00 – 5:30 p.m.	**Tree-coding of Beliefs for Improved Scalability of Stigmergic Control Systems** Jay Moore, Dr. Jerold Emhoff and Christopher McCubbin, The Johns Hopkins University Applied Physics Laboratory

Air Vehicle Operations III

4:00 – 4:30 p.m.	**Cooperative Hunter/Killer UAS Demonstration** Jeffrey Barton, Sean Martin and Christopher Chiu, JHU/APL, Walt Johnson and Reed Christiansen, Procerus Technologies
4:30 – 5:00 p.m.	**A Human Factors Centered Approach to UAV Mishap Analysis** Geoffrey Carrigan, M. L. Cummings and John Duffner, Humans and Automation Laboratory MIT, and Dave Long, Lean Advancement Initiative
5:00 – 5:30 p.m.	**The UK Predator Experience** (not available for posting) SQN LDR Richard Sanderson, RAF

Air Vehicle Power and Propulsion

4:00 – 4:30 p.m.	**Micro Air Vehicle (MAV) Mission Life Extension Through Perching** Capt. Michael Anderson, Eric Mees, Eddie Wright, Rob Carter, Will Johnson, Matt VanBaren, Dr. John Wood and Dr. Dan Jensen, U.S. Air Force Academy
4:30 – 5:00 p.m.	**Addressing the Flight Duration Issues for Micro Air Vehicles – Innovative Concepts and Prototypes for Importing Energy into the System** Dr. John Wood, Dr. Dan Jensen, Mike Yakima, Rich Riley, Seth Horner, John Smyrski, Kyle Smith, Chris Schumacher and Capt. Michael Anderson, US Air Force Academy
5:00 – 5:30 p.m.	**Preliminary Design of a Low Speed, Small UAV for Surveillance** (not available for posting) Jun Hu and Guanglin He, Beijing Institute of Technology

Ground Vehicle Payloads

4:00 – 4:30 p.m.	**Enhancing Man-Portable Robot Functionalities Through Integration of New Sensor Packages** Donald Fellars, Brandon Sights, Gaurav Ahuja, Greg Kogut, Bart Everett and Estrellina Pacis, SPAWAR Systems Center - San Diego
4:30 – 5:00 p.m.	**Nemesis: Robotic System for Humanitarian Demining** Dr. Dan Jensen, Mike Yakima, Dr. John Wood, Rich Riley, Seth Dr. Michael Hannan, John Wetzel and Jonathan Miller, Applied Research Associates

Thursday, June 12
8:00 a.m. – 2:00 p.m.
Poster Sessions

Sensor Analysis for Submarine Launched UAV
William Mulholland, Vince Amato and Paul Ryan, Whitney, Bradley & Brown

Flying Fish: A Persistent Ocean Surveillance Buoy with Autonomous Aerial Repositioning
Daniel Macy, Ryan Eubank, Ella Atkins, Luis Bernal, Peter Washabaugh and Guy Meadows, University of Michigan

Intelligent Control of Unmanned Systems as an Emergent Property of Situational Awareness
Michael A. Brown and Paul Avery, SwRI

RF Emitter Geolocation Using Multiple Small Unmanned Aerial Systems
Chris McCubbin, Robert Bamberger, Jay Moore and Ravi Goonasekeram, Johns Hopkins University Applied Physics Lab

Army Combat Casualty Care Collaborative Robotics & Unmanned Systems for Multiple Missions
Michael Beebe, Dr. Gary R. Gilbert, Mr. Troy Turner and Colonel James McGhee, MD, U.S. Army Telemedicine and Advanced Technology Research Center, and David Rousseau, U.S. Navy Space and Naval Warfare Systems Center, San Diego

Development of a UAV Deployable Reconnaissance System
John Bird, Jonathan Gaines, Chris Bright, Patrick Kopfle, James Chiang and Kevin Murray, Virginia Tech

Synchronous Methods in Acoustics
Dr. Colin Bradbury, Mt. Hukee Labs, Inc. dba Pacific Nautilus

Autonomous UAV Based Glycol Injected Pyrotechnic Ball Dispenser for Controlled Burn Applications
Rodney Brown and Lucas Martinez, Air Force Research Lab

Wireless Video Noise Classification for Micro Air Vehicles
Jeffrey Byrne and Raman Mehra, Scientific Systems Company, Inc.

Hands-free Control of Robots Using Non-Vocal Speech to Emulate Joystick-type Continuous Commands
Jonathan Brown, Tarun Pruthi, Siddharth Chhatpar, Lester Ngia and Jim Harris, Think-A-Move, Ltd.

Development of Small Scale Ducted-prop Aerial Vehicle
Dr. Seong Wook Choi, Sam Ok Koo and Jai Moo Kim, KARI (Korea Aerospace Research Institute)

Sensor Data, Gaming Provide Valued Mission Rehearsal for Ground Troops
Mark Conger, Northrop Grumman, and Jon Damush, 2D3 Inc.

Intelligent C2 Systems for Unmanned Ground Vehicles
Charles Little, Ralph R. Peters and J. Brian Rigdon, Sandia National Laboratories, and Kevin L. Conrad, Lockheed Martin

Airborne Platform CONOPS and Net-Centric Processing Extensions to Support Next Generation Tactical Manned/ Unmanned Teaming
Thomas Gaska, Dr. Robert Szczerba, Jeremy Impson and David Ciarletta, Lockheed Martin Systems Integration – Owego

HISAS 1030 on HUGIN AUV - High-resolution, Interferometric Synthetic Aperture Sonar (SAS)
Chris Hancock, Terje Fossum and Svein Otto Schjerven, Kongsberg Maritime AS

Semi-Autonomus Control of an Emergency Response Robot
Dr. Andreas Hofmann, Jamie Nichol and Daniel Theobald, Vecna Technologies, and Joe Fuller, Marshall University

A Multi-Objective Decision and Learning Model for Increased Autonomy of Unmanned Vehicles
Matthew Howard and Zhihua Qu, University of Central Florida, Kevin Conrad and Joseph Kaloust, Lockheed Martin

A DSP-Based Target Recognition Algorithm for Unmanned Aircraft System
Dr. Jinhui Lan, Tonghuan Huang and Lili Wan, University of Science and Technology Beijing, and Jie Li, Beijing Institute of Technology

Vision-Based Landing Guidance System for Micro Air Vehicle on the Sea
Jie Li and Yingdong Huang, Beijing Institute of Technology

Auto-Adaptive Processing on Autonomous Unmanned Vehicles
Robert Jannarone and John Tatum, Brainlike Surveillance, Inc., John Joseph, Nathan Naluai and Donald Statter, Naval Air Systems Command

SolarBubbles: An Autonomous Solar-Powered UAV
Andrew Klesh, Daniel Macy, Anthony Smith, Patrick Senatore, Nick Rooney and Jon Wiebs, University of Michigan

The Latest Generation of AUV Mounted Multibeam Echosounders: Improving Deep Sea Exploration
Chris Malzone, Thomas Meurling and Jon Marcus, RESON

Underwater to Above Water Communications using RF Technology
Brendan Hyland, WFS Ltd.

Highly Capable Payloads for Small/Medium Sized UAVs
Dr. William L. Kiser, Jr., Jeffrey Callen, Phillip Sherlock and John Branthoover, Penn State Electro-Optics Center, and Kevin Kearney, GeoSpatial Systems

Smart Area Weapons For UAVs
Richard Sterchele, Lou Cataldo and Lisa Atherton, Textron Defense Systems, and Ben Smith, Textron Corporation

Lynx SAR/GMTI Radar Update
Jim Thomson and Frank Yakos, General Atomics Aeronautical Systems

Thursday, June 12
Oral Presentations
9:30 - 11:30 a.m.

Four concurrent tracks as follows: (1) Air Vehicle Air-Space Control, (2) Air Vehicle Civil Applications I, (3) Ground Vehicle Navigation and (4) Maritime Missions

Air Vehicle Air-Space Control

9:30 – 10:00 a.m. **UAS Airspace Integration - The Communication Challenges**
Michael Neale, General Atomics Aeronautical Systems

10:00 – 10:30 a.m. **Enhanced RF Connectivity for Dense UAS Environments**
Dr. John Boyd, Cubic Corporation, Rob Frank, James Baker, Rockwell Collins, Inc.

10:30 – 11:00 a.m. **High-Level Alternatives for Integrating Unmanned Aircraft into Civil Airspace**
Andrew Lacher, Kelly Markin and Dave Maroney, The MITRE Corporation

11:00 – 11:30 a.m. **Human Supervisory Control of an Autonomous Helicopter Using LIDAR and Stereovision**
Dr. Kevin Kochersberger, Andrew Culhane and Adam Sharkasi, Virginia Tech, Jacob Crandall, Massachusetts Institute of Technology, and John Smart, Pacific Northwest National Laboratory

Air Vehicle Civil Applications I

9:30 – 10:00 a.m. **Using Unmanned Aircraft Systems in Hurricanes: NOAA and NASA's Early Success**
Dr. Joseph Cione, NOAA AOML Hurricane Research Division, Eric Uhlhorn, NOAA Hurricane Research, Peter Turlington, NASA Goddard Wallops, Michael Goodman, NASA Earth Sciences Office, and Peter Bale

10:00 – 10:30 a.m. **UAS for International Polar Year and Arctic Science Missions**
Dr. Susan Schoenung, Longitude 122 West, Inc., and Randal Albertson, NASA Dryden Flight Research Center

10:30 – 11:00 a.m. **Western States UAS Fire Mission 2007: Overview of Capabilities, Successes and Fire Management Community Perspective**
Vince Ambrosia, CSUMB/NASA-Ames Research Center, Tom Zajkowski, RedCastle Resources/USDA-Forest Service, Everett Hinkley and Darrel VanBuren, USDA Forest Service, and Brent Cobleigh, NASA-DFRC

11:00 – 11:30 a.m. **Operational Experience with Long Duration Wildfire Mapping UAS Missions Over the Western United States**
LCDR Phillip Hall, Greg Buoni, Brent Cobleigh and Kathleen Howell, NASA Dryden Flight Research Center

Ground Vehicle Navigation

9:30 – 10:00 a.m. **Design and Evaluation of a Self-Contained Collaborative Autonomy Unit for UGVs**
Dr. Douglas C. MacKenzie and Aditya Nawab, Mobile Intelligence Corporation

10:00 – 10:30 a.m. **Vision-Based Obstacle Detection for Autonomous Off-Road Navigation** (not available for posting)
Dr. Wes Huang and Brian Stancil, Applied Perception, Inc., a Foster-Miller Company

10:30 – 11:00 a.m. **Packbot with Mapping Kit: Real-time 2D Mapping and Safe-Guarded Teleoperation**
Jonathan Brookshire, iRobot

11:00 – 11:30 a.m. **LADAR-Based Vehicle Tracking and Trajectory Estimation for Urban Driving**
Dr. Daniel Morris, Paul Haley, William Zachar and Steve McLean, General Dynamics Robotic Systems

Maritime Missions

9:30 – 10:00 a.m. **Increasing Hydrographic Survey Capacity and Capability by Use of AUVs**
Chris Hancock, Kongsberg Underwater Technology, Inc., Dr. Freddy Pøhner, Karstein Vestgård and Bjørn Jalving, Kongsberg Maritime AS

10:00 – 10:30 a.m.	**Reliable Mission Execution Using Unreliable UUVs** Gary Giger and John Dzielski, Applied Research Lab/PSU, and Mahmut Kandemir, Pennsylvania State University
10:30 – 11:00 a.m.	**An Autonomous Energy Harvesting Sailing Vessel for Persistent Ocean Surveillance** Dr. Linda Frizzell-Makowski, Richard Shelsby, David Scheidt, Karl Kreatschman, Anthony Nardo, Charles Cooperman, Jennifer Mann, Ronald Mitnick, David Shibilisky and John Cole, Johns Hopkins University Applied Physics Laboratory
11:00 – 11:30 a.m.	**Manta Ray - Unmanned Underwater Riverine Craft** Richard Adams, Trident World Systems, Inc.

Thursday, June 12
Oral Presentations
1:00 - 3:00 p.m.

Four concurrent tracks as follows: (1) Air Vehicle Civil Applications II, (2) Air Vehicle Control, (3) Air Vehicle Systems and (4) Multiple Platforms

Air Vehicle Civil Applications II

1:00 – 1:30 p.m.	**Using Small UASs to Capture Multispectral Imagery for Use in Precision Agriculture** David Dvorak, Mariusz Czarnomski, Matthew Lendway, Florent Martel, William H. Semke and Richard R. Schultz, University of North Dakota
1:30 – 2:00 p.m.	**Autonomous UAV Swarms for Detection and Classification of Chemical and Biological Agents** Chad Hawthorne, Chris Chiu, Steve Marshall and Adam Watkins, JHU/APL, David Ferris, United States Naval Academy, and Chris Keiser, Edgewood Chemical and Biological Center
2:00 – 2:30 p.m.	**Interoperability Challenges with UAV Sensor Data** Donnie Self, National GeoSpatial-Intelligence Agency (NGA) Airborne Integration Branch
2:30 – 3:00 p.m.	**FAA Sense and Avoid Requirements: A Starting Point** Capt Eric Rucker, Lt. Kenneth LeBay and LtCol Andy Thurling, 452d Flight Test Squadron

Air Vehicle Control II

1:00 – 1:30 p.m.	**Case Study: Controlling and Autonomously Landing a Damaged UAV** Dr. David Vos, Athena Technologies, Inc.
1:30 – 2:00 p.m.	**Human Factors in GCS Design: The Predator/Reaper Approach** Carl Thunberg, 658th AESG, and Anthony Tvaryanas
2:00 – 2:30 p.m.	**A Day in the Life of a UAV Deployment: Lessons Learned** Don Iverson , The Boeing Company
2:30 – 3:00 p.m.	**Unmanned Aerial Vehicle Survivability Testing and Analysis** David Hall, Ron Dexter and Mike Ray, SURVICE Engineering Company

Air Vehicle Systems

1:00 – 1:30 p.m. **Solar HALE UAVs**
Frank Kiendl, German Liaison Office

1:30 – 2:00 p.m. **Naval UAS Expansion**
Gary Kessler, NAVAIR PEO (U&W)

2:00 – 2:30 p.m. **Fire Scout Systems Description and Status Update**
Michael Fuqua, Northrop Grumman

2:30 – 3:00 p.m. **Advanced-UAS, a Modular UAS Solution for Surveillance & Recce Missions**
Franz Bucher, EADS – Deutschland GmbH

Multiple Platforms

1:00 – 1:30 p.m. **Lessons Learned When Leaping from Simulation to Live Operations with Multiple Unmanned Systems**
Thomas Moulds, Defense Technologies, Inc., Marc Steinberg, ONR, and Sean Kaner, Wyle Lab

1:30 – 2:00 p.m. **Mixed-Initiative Adjustable Autonomy for Human-Unmanned System Teaming**
Dr. Meghann de Brun, Vera Zaychik Moffitt, Jerry L. Franke, Dimitri Yiantsios, Trevor Housten, Adria Hughes, Drew Housten and Shannen Fouse, Lockheed Martin Advanced Technology Laboratories

2:00 – 2:30 p.m. **Collaborative Target Localization and Inspection Using a Heterogeneous Team of Autonomous Vehicles**
David Van Covern, TORC Technologies, Dr. Charles Reinholtz, Embry Riddle University, Al Wicks and Craig Woolsey, Virginia Tech

2:30 – 3:00 p.m. **Efficient Swarming Algorithms for Information Distribution**
Christopher McCubbin, R. Scott Cost, Markus Dale and Daniel Bankman, JHU/APL