

Final Program

The Huntsville Simulation Conference ***HSC 2005***

“Modeling & Simulation: Providing Answers to Real World Questions”

The Advanced Research Center (ARC)

October 25, 2005 (Classified Sessions) – 1:30 to 5:00

The Huntsville Marriott

October 26, 2005 – 9:00 to 5:30

October 27, 2005 – 8:00 to 1:30

Invited Keynote Speaker: Colonel Jerry A. Glasow

Director, Defense Modeling and Simulation Office

Invited Luncheon Speaker: Tom Sever

Remote Sensing/Archeologist, Earth Systems Science Office

NASA-Marshall Space Flight Center

Invited Luncheon Speaker: Ed Buckbee

Former Director of the U.S. Space and Rocket Center

Author of “The Real Space Cowboys” with Wally Schirra

Conference General Chairman: Joseph S. Gauthier

[Gauthier Simulation, Inc.](#)

Primary Sponsor

[The Society for Modeling and Simulation International](#)

P.O. Box 17900, San Diego, CA 92177

(858) 277-3888; www.scs.org

CONFERENCE PROGRAM

This Program contains information accurate early October. The conference may deviate due to authors withdrawing and other reasons. A conference Proceedings is available on CD and distributed at the conference. Hard copies of the proceedings are printed and shipped after the conference.

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ALABAMA MODELING AND SIMULATION COUNCIL MEETING

(AMSC - www.AMSC.to)

Thursday, October 27, 2005, 1:30 – 5:00, Marriott Salon A, B, C

KEYNOTE: Col. Jerry Glasow, Director, Defense Modeling and Simulation Office

TECHNOLOGY: Dr. Mikel Petty, Director, Center for Modeling Simulation and Analysis, UAH

PROFESSIONAL DEVELOPMENT: Mr. William Tucker, Director, M&S, Boeing Phantom Works

INDUSTRIAL DEVELOPMENT: Mr. Russ Hauck, Director, National Center for Simulation

BUSINESS PRACTICE: Mr. Warren Katz, President, Mäk Technologies

CONFERENCE COMMITTEE

The Society for Modeling and Simulation International wishes to thank and acknowledge the following individuals and their respective organizations for their contributions to the success of this conference:

Paul Agarwal, COLSA Corporation
Demetrius Bell, CAS, Inc.
Alleen Bray, The Aegis Technologies Group
Tom Colbey, Jr., C3 Interactive
Harold Dessau, CAS. Inc.
Bruce Fairchild, Society for Modeling and Simulation International
Gloria Flowers, U.S. Army Space and Missile Defense Command
Bruce Fowler, U.S. Army Research, Development, and Engineering Command
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Marcy Robinson, Alion-CATI
Bernard Schroer, University of Alabama in Huntsville
Alan M. Shih, University of Alabama at Birmingham
Nick Vamivakas, Raytheon
Ralph Weber, Computer Sciences Corporation
Bill Wessels, BAE Systems
Jeanette Wilson, Trideum Corporation

PROFESSIONAL ENGINEER CONTINUING EDUCATION UNITS

Attendance at this conference can be credited towards Professional Engineer Continuing Education Units (CEU).

CERTIFIED MODELING AND SIMULATION PROFESSIONAL RECERTIFICATION UNITS

This conference qualifies for Recertification Units (RU's) for the Certified Modeling and Simulation Professionals (CMSP) as administered by the Modeling and Simulation Professional Certification Commission (MSPCC – www.SimProfessional.org)

Military Modeling & Simulation: Imagine the Next Level of Interoperability

**Invited Keynote Speaker: Colonel Jerry A. Glasow
Director, Defense Modeling and Simulation Office (DMSO)**

Wednesday, October 26, 2005, 9:00a.m.

Plenary Session Sponsored by [Science Applications International Corporation \(SAIC\)](#)

Colonel Glasow entered the Army in May 1982 upon graduating from Texas A&M University as a Distinguished Military Graduate. His assignments prior to DMSO include Squadron Chemical Officer / Assistant Operations Officer -3rd Squadron, 4th U.S. Cavalry Regiment; Division Chemical Staff Officer - 25th Infantry Division; Chief, External Evaluation Division, U.S. Army Chemical School, Senior Military Analyst / Wargaming Officer -U.S. Army Chemical School; Regimental Chemical Officer -3rd Armored Cavalry Regiment; Contamination Avoidance Systems Integrator -Office of the Deputy Chief of Staff for Operations and Plans; Munitions Requirements Analyst & Nuclear, Biological, and Chemical Warfare Analysis Reviewer -U.S. Army Center for Army Analysis; Modeling and Simulation Special Assistant to the Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense; Military Assistant for Weapons of Mass Destruction and Chemical Weapons Demilitarization to the Deputy Under Secretary of the Army for Operations Research. He reported to DMSO as the Deputy Director for Requirements in July 2004 and became Director in January 2005.

Colonel Glasow's academic accomplishments include Texas A&M University -B.S., Chemical Engineering; Chemical Officer Basic and Advanced Courses, U.S. Army Chemical School; Naval Postgraduate School -M.S., Operations Research; and Industrial College of the Armed Forces at the National Defense University -M.S., Strategic Resource Management. Colonel Glasow is a member of the Order of Dragons, U.S. Army Chemical Corps and a member of the Order of Saint Barbara, U.S. Army Artillery Corps. Colonel Glasow's awards and decorations include the Army Meritorious Service Medal (Four Oak Leaf Clusters), the Army Achievement Medal (one Oak Leaf Cluster), 1997 Director's Award for Outstanding Team Analyst, Center for Army Analysis; and 1998 Director's award for Outstanding Individual Analyst, Center for Army Analysis

Beneath the Forest: The Ancient Maya Landscape From Space

Invited Luncheon Speaker: Thomas L. Sever

Remote Sensing/Archeologist, Earth Systems Science Office
NASA-Marshall Space Flight Center

Wednesday, October 26, 2005, 12:00p.m.

Luncheon Program Sponsored by [COLSA Corporation](#)

The Peten region of northern Guatemala is a region where major archeological sites remain to be discovered. It was in this area that the Maya civilization began, flourished, and abruptly disappeared. Remote sensing technology is helping to locate and map ancient Maya sites that are threatened today by accelerating deforestation and looting. Thematic Mapper and IKONOS satellite and airborne Star3-I radar data, combined with Global Positioning System (GPS) technology, are successfully detecting ancient Maya features such as cities, roadways, canals, and water reservoirs. Satellite imagery is also being used to map the bajos, which are seasonally flooded swamps that cover over 40% of the land surface. The use of bajos for farming has been a source of debate within the professional community for many years. But the recent detection and verification of cultural features within the bajo system by our research team are providing conclusive evidence that the ancient Maya had adapted well to wetland environments from the earliest times and utilized them until the time of the Maya collapse. The use of the bajos for farming is also an important resource for the future of the current inhabitants who are experiencing rapid population growth. Remote sensing imagery is also demonstrating that in the Preclassic period (600 BC- AD 250), the Maya had already achieved a high organizational level as evidenced by the construction of massive temples, murals, and an elaborate inter-connecting roadway system. Although they experienced several setbacks such as droughts and hurricanes, the Maya nevertheless managed the delicate forest ecosystem successfully for several centuries. However, around AD 800, something happened to the Maya to cause their rapid decline and eventual disappearance from the region. The evidence indicates that at this time there was increased climatic dryness, extensive deforestation, overpopulation, and widespread warfare. Our research suggests that the destruction of the landscape by human activity contributed to this collapse. We are using remote sensing products and other observations to understand both natural and human-induced mechanisms driving past, present, and potential future climate variability over Central America.

Thomas L. Sever. Ph.D., University of Colorado, 1990. Remote Sensing Specialist/Archeologist, Global Hydrology and Climate Center, NASA-Marshall Space Flight Center, AL. 1981-1997 Remote Sensing/Archeologist, Earth Systems Science Office, NASA-Stennis Space Center, MS. Former Positions: Assistant Professor, U. of Southern Mississippi; Scientific Supervisor, Lockheed Electronics Corp., NSTL, MS. Dr. Tom Sever has over 20 years experience in environmental/archeological research. He has been a pioneer in bringing remote sensing/GIS technology to the disciplines of anthropology and archeology. He has worked with various airborne and satellite systems conducting international research in Israel, Peru, Chile, Mexico, Costa Rica, Guatemala and the U.S. His awards include the Society of Professional Archeologists (SOPA) Exceptional Achievement Award (1994), NASA Exceptional Achievement Award (1993), and NASA Exceptional Scientific Achievement Award (1992 and 2004). In addition to the professional literature his work has been featured in National Geographic, Archaeology Magazine, Omni Magazine, Discovery, Newsweek, New York Times, Smithsonian Air and Space, and the Discovery Channel.

The REAL Space Cowboys

Invited Luncheon Speaker: Ed Buckbee

Former Director of the U.S. Space and Rocket Center

Thursday, October 27, 2005, 12:00p.m.

Ed Buckbee teamed up with Wally Schirra on a newly released book entitled, "The REAL Space Cowboys". In 1959, seven U.S. military fighter pilots were selected to train as America's first astronauts. Alan Shepard, Gordon Cooper, Gus Grissom, John Glenn, Scott Carpenter, Wally Schirra and Deke Slayton accepted the country's call to service and would become known as the Mercury Seven (M7). These men, who had jockeyed for the best flying jobs in the military, began competing for rides on rockets. Most would eventually vie for the ultimate ride to the moon. This was the dream—a chance to ascend to the top of the pyramid—a lion-hearted pilot's deepest desire. Long time Huntsville resident, Buckbee, who has enjoyed a 40 + year association with the U.S. manned space flight program, follows these brave men who pioneered the U.S. space program. Through time and personal friendships, he captures dreams of flying higher, faster and farther than anyone in the known universe. They are The REAL Space Cowboys.

An alumni of NASA Public Affairs and author, Buckbee was selected to be the first director of the U. S. Space and Rocket Center, Huntsville, Alabama in 1968 where he continued to bring the space program into peoples lives for over 25 years before retiring in 1994. Among his most noted accomplishments, Buckbee is the founder of the highly successful U.S. Space Camp and Aviation Challenge programs introduced at the U.S. Space and Rocket Center in 1982. Buckbee conceived and developed the Famous Firsts exhibit telling the story of the Mercury astronauts at the U.S. Astronaut Hall of Fame near NASA's Kennedy Space Center in Florida. With the help of Mercury astronauts Alan Shepard, Wally Schirra and John Glenn, the exhibition was expanded to honor the astronauts from the Gemini, Apollo and Skylab programs.

Buckbee is a distinguished alumnus with a bachelor's degree in journalism from the P. I. Reed School of Journalism, West Virginia University. His many awards include the NASA Distinguished Public Service Medal and Department of Army Distinguished Civilian Service Award. In addition, he has authored and edited several publications including, "50 Years of Rockets and Spacecraft" and a children's series on U.S. Space Camp.

**THE ADVANCED RESEARCH CENTER (ARC)
CLASSIFIED PRESENTATIONS**
Session Chair: Steve Wiley, COLSA Corporation

TUE, 1:30 > Welcome

TUE, 1:45 > Determination of the Laser Radar Cross-Section for a Spherical Target using the Phong Model
Jim Evans, CAS-Inc.

TUE, 2:15 > Super-Resolution of HALO-II IR Imagery
R. A. Reed and S. R. Wiggin, ATA Inc.

TUE, 2:45 > System Test & Evaluation Planning Analysis Lab
Kendell Phillips, Westar Aerospace & Defense Group

TUE, 3:30 > Break

TUE, 4:00 > Force Encampment Protection System
Kevin Nash and Pete Kirkland, U.S. Army Space & Missile Defense Technical Center

TUE, 4:45 > Technology Concepts Evaluation Lab
Carol Jenkins and Carey Leu, COLSA Corporation

***PATHFINDER*
VISUALIZATION**

Session Chair: Sharon Hardy, Computer Sciences Corporation

WED, 10:30 > Adaptive Distributed Source Coding of Highly Correlated Still Images
Jing Cai, W. David Pan, University of Alabama in Huntsville; Paul G. Cox, PERL Research

WED, 11:00 > Simulation of Hidden Message Length Estimation of Least Significant Bit Steganography
Ambrey Watkins and W. D. Pan, University of Alabama in Huntsville

WED, 11:30 > Higher Order Statistical Analysis of Steganographic Images using Wavelet Transforms
Poorna Chand Paritala and W. David Pan, University of Alabama in Huntsville

***PATHFINDER*
TRANSPORTATION MODELING AND SIMULATION**

Session Chair: Dr. Steven Jones, University of Alabama

WED, 1:30 > Simulation of Freight Transportation in Alabama
Heather Shar, Michael Anderson, Maruf Rahman, Greg Harris, Bernard Schroer
University of Alabama in Huntsville

WED, 2:00 > Traffic Modeling, Analysis, and Simulation Outreach & Deployment Efforts
John E. Tolle, FHWA Resource Center

WED, 2:30 > Performance Evaluation of Hydrogen Vehicle Technology
Virginia P. Sisiopiku, University of Alabama at Birmingham
Sreenu Prakash S. Jasti, Wood/Patel and Associates, Inc.

WED, 3:00 > Comparison of Urban Interchange Options

Jonathan E. Byrd, Gresham, Smith and Partners

Virginia P. Sisiopiku, University of Alabama at Birmingham

WED, 3:30 > FRESIM versus VISSIM – Simulating a Weaving Section

Ghulam H. Bham and Shengnan Kan, University of Missouri-Rolla

WED, 4:00 > An Empirical Study Of Microscopic Lane-Changing Behavior On A Multilane Freeway

Vivek Goswami and Ghulam H. Bham, University of Missouri-Rolla

WED, 4:30 > A Combined Travel Demand–Simulation Methodology to Evaluate Video Surveillance Technology

Michael D. Anderson, University of Alabama in Huntsville

WED, 5:00 > University of British Columbia Transit Terminal Operational Study using Microsimulation

Hansel Wang, Transportation Engineering; Jim Dale, PTV America, Inc.

William Baumgardner, Arup; Kean Lew, PTV America, Inc.

PATHFINDER

AGENT BASED SIMULATION

Session Chair: Michelle Herman, Computer Sciences Corporation

THU, 8:30 > AdSiF: Agent Driven Simulation Framework

Mehmet F. Hocaoglu, Technical & Scientific Research Council of Turkey

THU, 9:00 > Simulation based Facility Layout Planning: A DEVS Implementation

Mehmet F. Hocaoglu, Technical & Scientific Research Council of Turkey

PATHFINDER

TEST AND TRAINING

Session Chair: Demetrius Bell, CAS, Inc.

THU, 10:00 > Deployable Instrumentation System in Europe

Charles Phillips, Gary Watkins, John Todd and Micah Jay Hixon, Computer Sciences Corporation

THU, 10:30 > Voice Controlled Automated Simulation

Michelle Fullerton and Jeff Maddox, U.S. Army Aviation and Missile Research, Development, and Engineering Center

THU, 11:00 > Correlating Automated and Flight Instructor Assessments of Straight-In Landing Approaches by Novice Pilots on a Flight Simulator

Bruce E. Heath, M. Javed Khan, Marcia Rossi and Syed Firasat Ali, Tuskegee University

THU, 11:30 > Using Graphics Processing Units for High Fidelity Low-Cost Sensor Simulation Training System

Dezhi Liao, University of Central Florida

ENTERPRISE
COMPUTATIONAL STRUCTURAL MECHANICS
Session Chair: Dr. Roy P Koomullil, University of Alabama at Birmingham

WED, 10:30 > Advanced Shaped Charge Simulation and Design

*T.H. Vuong, J. Pham, K. Ng, D. Pfau, J. Pincay and B.E. Fuchs
U.S. Army Armament, Research, Development, and Engineering Center*

WED, 11:00 > Empirically Based Simulation of Shaped Charge Jet Characteristics

J. Pham, T. Vuong, D. Pfau and J. Pincay, U.S. Army, Armament Research, Development, and Engineering Center

WED, 11:30 > Design, Optimization, and Mechanical Performance Evaluation of Coronary Stents Using Computational Engineering

Dimble Dipesh, Alan Shih, and Evengelos Eleftheriou, University of Alabama at Birmingham

WED, 1:30 > Weld Joint Simulation

Michael Showalter and Phillip Smith

WED, 2:00 > Comparisons between Detailed and Simplified Models for Thin-Walled Beam Structures

Yucheng Liu and Michael L. Day, University of Louisville

WED, 2:30 > 3D Finite Element Simulation of Rolling Contact with Residual Stress

Dale W. Schwach and Y.B. Guo, University of Alabama

ENTERPRISE
COMPUTATIONAL FLUID DYNAMICS
Session Chair: Dr. Alan M. Shih, University of Alabama at Birmingham

WED, 3:00 > Solution-Based Unstructured Mesh Redistribution

Yasushi Ito, Roy P Koomullil, Alan M. Shih, Jebin Jacob and Bharat K. Soni, University of Alabama at Birmingham

WED, 3:30 > A One-Dimensional Subgrid Near Wall Treatment for Turbulent Flow CFD Simulations

Seth Myers and D. Keith Walters, Mississippi State University

WED, 4:00 > Navier-Stokes Simulations of Complex Missile Configurations with Moving Control Surfaces using Unstructured Grids

Eric L. Blades and David L. Marcum, Mississippi State University

WED, 4:30 > New Quasi-Covariance-based 2D Quad Mesh Smoothing

Hongtao Xu and Timothy S. Newman, University of Alabama in Huntsville

WED, 5:00 > Implementation of the Reynolds Stress Model for Simulations of Internal Flows in Turbomachinery

*Minsuk Choi, Pohang University of Science & Technology
Bharat K. Soni, University of Alabama at Birmingham
Jehyun Baek, Pohang University of Science & Technology*

ENTERPRISE
ENVIRONMENTAL MODELING AND SIMULATION
Session Chair: Dr. Heng Ban, University of Alabama at Birmingham

THU, 8:30 > Prediction of Mercury Speciation in Coal Combustion Systems

*Neelesh S. Bhopatkar, University of Alabama at Birmingham; Thomas K. Gale, Southern Research Institute
Peter Walsh and Heng Ban, University of Alabama at Birmingham*

THU, 9:00 > Development of Alkali Metal Speciation Model for Biomass Syngas Clean-up

*Pavankumar Sonwane, University of Alabama at Birmingham; Thomas K. Gale, Southern Research Institute
Heng Ban, University of Alabama at Birmingham*

ENTERPRISE
NETWORK MODELING AND SIMULATION
Session Chair: Dr. Claudette C. Owens, U.S. Army Space and Missile Defense Command

THU, 10:00 > Simulating Disease Patterns for Email Viruses

James Harris, Georgia Southern University

THU, 10:30 > Modeling Approach to Support Performance Comparison of Competing Peer-to-Peer Network Architectures

Glenn W. Cox, Ayondeep Datta and Letha Eitzkorn, University of Alabama in Huntsville

THU, 11:00 > Identifying a Framework for Evaluating Large Network Design Alternatives in Modeling and Simulation

*James Dimarogonas, The MITRE Corporation
Seth Spoenlein, Communications and Electronics Research, Development and Engineering Center*

THU, 11:30 > A Collision Free MAC Layer Protocol for Event Based Data Gathering in Wireless Sensor Networks

*Shafaq Chaudhry, University of Central Florida; Yi Qian, University of Puerto Rico at Mayaguez
Ratan Guha and Seema Bandyopadhyay, University of Central Florida*

CHALLENGER
COMMUNICATIONS MODELING
Session Chair: Gloria Flowers, U.S. Army Space and Missile Defense Command

WED, 10:00 > Simulation of MIMO Wireless Communication System Using Matlab

Liu Xiaoyu and Bing W Kwan, Florida State University

WED, 10:30 > Alamouti Coding Performance Evaluation in Flat Fading Channels

Hai H. Hoang and Bing W. Kwan, Florida State University

WED, 11:00 > Optimization Methods for Estimating Angles of Arrival

Hai H. Hoang, Bing W. Kwan, and Xiaoguang Ma, Florida State University

WED, 11:30 > Linear Maximum Likelihood Decoding of MIMO-OFDM Systems in Non-quasi-static Channels

Peng Zhang and Laurie L. Joiner, University of Alabama in Huntsville

CHALLENGER

PANEL DISCUSSION: REAL-TIME AND NON REAL-TIME SIMULATION FOR MARINE APPLICATIONS

Session Chairs: Narain G. Hingorani, Consultant

Roy Crosbie, California State University, Chico

WED, 1:30 - 5:30

Real-Time and Non Real-Time Simulation for Marine Applications

Narain G. Hingorani, Consultant

Low-Cost, High-Speed, Real-Time Simulation for Electric Ship Power Systems

Roy E. Crosbie, California State University, Chico

Applications of Forward and Inverse Simulation Methods for Marine Systems Research

David J. Murray-Smith and Euan W. McGookin, University of Glasgow

High Fidelity Real-Time and Faster-Than-Real-Time Distributed Simulation of Marine Ship Power Systems using RT-LAB, Simulink, Dual-Core Opteron and Infiniband Technologies.

Jean Bélanger, Simon Abourida and Christian Dufour, Opal-RT Technologies

Transient Simulation of Marine Electric Networks: Challenges and Solutions

A.M. Gole, University of Manitoba

Large-Scale Real-Time Simulations of Marine Power-Systems

S. Woodruff, M. Steurer and P.G. McLaren, Florida State University

Integration of Simulation into the Workflow Process for Ship Design

Roger A. Dougal, Blake Langland, and Eugene V. Solodovnik, University of South Carolina

Improving Integration Test Accuracy and Efficiency through the Use of Automatic Hardware in the Loop Rig Calibration

Scott James and Ajit Shenoy, Applied Dynamics International

Modeling and Simulation for Electric Warship Design and Development

Terry Ericson, Office of Naval Research

CHALLENGER

COLLABORATIVE ENVIRONMENTS

Session Chair: James Head, U.S. Army Aviation and Missile Research Development and Engineering Center

THU, 8:30 > Knowledge-Based Engineering as a Platform for Simulations Development and Deployment

David J Cooper Jr, Genworks International; Brian Sorg, Liberating Insight; David F Smith, Analytical Services, Inc.

THU, 9:00 > Collaborative, Multi-disciplinary, M&S Environment for Weapon and Missile Systems*

P. Richard Zarda, Frank A. St. John, Carlos G. Ruiz and Hanee Z. Kabis, Lockheed Martin Missiles and Fire Control

David F. Smith, Analytical Services, Inc.

CHALLENGER
HARDWARE IN THE LOOP MODELING AND SIMULATION

Session Chair: Anthony N Vamivakas, Raytheon Company

THU, 10:00 > A Range Delay Unit Using Digital Radio Frequency Memory

T. Hampsch, C. Bartlett, H. Snyder, P. Murphy, Raytheon Integrated Defense Systems

THU, 10:30 > New Generation of IR Emitter Arrays Based on the Liquid Crystal on Silicon Chip and Ferro-Electric Liquid Crystal

Jack R Lippert, Dynetics, Inc; Teresa K Ewing, Boulder Nonlinear Systems, Inc.

THU, 11:00 > Tactile Feedback System for a Simulator

Ed Fadden, Willis H. Deiss and Clare Savaglio, Applied Dynamics International

THU, 11:30 > Temporal Fluctuations of Missile Exhaust Plume IR Signatures for HWIL Simulation

W. E. Taylor, ATA Inc.

COLUMBIA

TUTORIAL: RF-INJECTION FOR A MISSILE HARDWARE-IN-THE-LOOP SIMULATION

Helmut Snyder, Raytheon Company

WED, 10:30 - 12:00

This tutorial presents the concepts, configuration and special models for the RF-injection method applied to a radar-based missile hardware-in-the-loop simulation. The missile RF-injection method inserts sum and difference channel signals into the radar-based missile-under-test downstream from where these signals are normally created by the missile's antenna electronics. The missile RF-injection method reduces costs by eliminating the need for an anechoic chamber, moveable target generator, flight table and their maintenance. Some fidelity is expected to be lost but multiple-target simulation capabilities are increased. The methodology is not new and has been used for testing radar units, but its use for a missile hardware-in-the-loop simulation is new. Similar video-injection techniques for missiles using IR or visible light to track targets are not described.

COLUMBIA

**TUTORIAL: IMPLEMENTING PERFORMANCE BASED LOGISTICS
A STRATEGIC "SUPPLY CHAIN" APPROACH FOR INVENTORY MANAGEMENT**

Greg H. Parlier, University of Alabama in Huntsville

WED, 1:30 - 4:30

This tutorial introduces and presents a systems approach guiding an ongoing project which addresses many of the significant challenges confronting Logistics Transformation. The focus is on inventory management policy prescriptions illuminated through the prism of an enterprise-wide supply chain analysis emphasizing Army aviation systems.

COLUMBIA

CONTEMPORARY MILITARY MODELING EFFORTS

Session Chair: Dr. Bruce W. Fowler, U.S. Army Aviation and Missile Research Development and Engineering Center

WED, 4:30 > Automated Target Recognition and Fratricide Reduction

Bruce W. Fowler and William C. McCorkle

U.S. Army Aviation and Missile Research, Development, and Engineering Center

WED, 5:00 > Network Diffusion Processes

Bruce W. Fowler, U.S. Army Aviation and Missile Research, Development, and Engineering Center

COLUMBIA
SUPPLY CHAIN AND LOGISTICS MODELING AND SIMULATION
Session Chair: Gregory A. Harris, University of Alabama in Huntsville

THU, 8:30 > Aligning Supply Chain Strategy with Product Demand Characteristics
Gregory A. Harris and Paul Compton, University of Alabama in Huntsville

THU, 9:00 > Enabling A Transforming Army At War: A Supply Chain Approach to Improve Logistics Chain Efficiency and Effectiveness
Greg H. Parlier, University of Alabama in Huntsville

THU, 9:30 > The Use of LogicTools' Inventory Analyst™ to Help Correct Supply Chain Problems
Sherry Starling, University of Alabama in Huntsville

THU, 10:00 > Break

THU, 10:30 > Optimization Strategies for Complex Supply Chains
Ruby Lathon, EMT, Inc.; Sampson Gholston, University of Alabama in Huntsville

THU, 11:00 > Applying Discrete Event Simulation in Condition-based Logistics
Naaman Gurvitz, Clockwork Solutions

THU, 11:30 > Parallel Pull Flow: A New Lean Production Design
Steve L. Hunter, Mississippi State University

ATLANTIS
TUTORIAL: COMMON SIMULATION FRAMEWORK BASICS
David Harbison, U.S. Army Aviation and Missile Research Development and Engineering Center
David Edgemon, Summit Research Corporation; Brett Gossage, Invariant Corporation
WED, 10:30 - 12:00

This tutorial provides a basic overview of the Common Simulation Framework (CSF), an object oriented simulation framework developed and maintained by the US Army System Simulation and Development Directorate. The tutorial provides the user with a quick look at CSF including installation and configuration, the basic concepts of using CSF, and 3 example programs that illustrate using CSF at the source code and tool level. The examples cover using CSF tools to build simple CSF C++ class's, connecting the objects to form a simulation system, and performing I/O.

ATLANTIS
TUTORIAL: USING C++ MODEL DEVELOPER TO BUILD SIMULATIONS OF DYNAMIC SYSTEMS
Ray Sells, DESE Research Inc.
George W. Snyder, Jeffrey Hester, and George A. Sanders III
U.S. Army Aviation and Missile Research Development and Engineering Center
WED, 1:30 - 4:30

CMD is an OPEN-SOURCE C++ based environment for building simulations of systems described by time-based differential equations. CMD provides the mechanisms every person needs to develop simulations using the C++ programming language and is based on man-years of development using proven design patterns.

**ATLANTIS
VERIFICATION AND VALIDATION**

Session Chair: Thom McLean, Georgia Tech Research Institute

WED, 4:30 > Climbing the Simulation Pyramid: Maintaining Verification and Validation of Model Results from Engineering to Effects Level Simulations

Chris Burns, Science Applications International Corporation

WED, 5:00 > Similarity Measures and Validation in Automated Modeling

Dev Nag and Glen E.P. Ropella Tempus Dictum, Inc; C. Anthony Hunt. University of California

**ATLANTIS
BIOMEDICAL MODELING AND SIMULATION**

Session Chair: Dr. Andreas Anayiotos, University of Alabama at Birmingham

THU, 8:30 > Image Registration for Visible Male Image Data

Ramesh Praveenkumar, Alan M. Shih and P. Corey Shum, University of Alabama at Birmingham

THU, 9:00 > Simulations for a Liquid-crystal-based Sensor System Using a Continuum Model

Huangli Wu and Rajendran Mohanraj, Mississippi State University

THU, 9:30 > Hemodynamics of the Image Based Femoral Artery Bifurcation Model

Rohan More, Gilberto Russo, Alan Shih, Yasushi Ito, Andreas Anayiotos, University of Alabama at Birmingham

THU, 10:00 > Comparison of BRISK and Conventional VEC MRI Scanning Techniques by Using Simulated Model with Pulsatile Jet Flows

*Longchuan Li, University of Alabama at Birmingham, Mark Doyle, Allegheny General Hospital
Rohan More, University of Alabama at Birmingham; Geetha Rayarao, Allegheny General Hospital
Andreas S. Anayiotos, University of Alabama at Birmingham*

THU, 10:30 > Effects of Venous Needle Flow During Hemodialysis

*Thanh N. Huynh, Balu Chacko, Rakesh P. Patel, Brigitta C Brott, Michael Allon and Andreas Anayiotos
University of Alabama at Birmingham*

THU, 11:00 > A High-Resolution Finite Element Head Model to Evaluate Traumatic Brain Injury

*Jong-Eun Kim, Young-Ho Kim, Yasushi Ito, Corey Shum, and Alan Shih
University of Alabama at Birmingham*

THU, 11:30 > Multiphysics Modeling and Simulation of Pulsatile Flow through a Curved Stenotic Artery

*Jong-Eun Kim and Young-Ho Kim, University of Alabama at Birmingham
Minsuk Choi and Jehyun Baek, Pohang University of Science & Technology*

**DISCOVERY
METHODS**

Session Chair: Thom McLean, Georgia Tech Research Institute

WED, 10:30 > A Comparison of Model-Based Systems Engineering and Composability Theory

Roland R. Mielke, Virginia Modeling, Analysis, and Simulation Center

Mikel D. Petty, University of Alabama in Huntsville; Eric W. Weisel, WernerAnderson, Inc.

WED, 11:00 > Fundamental Concepts in the Science of (Dynamic System) Modeling; The Concept and Consequences of “Modeling-Errors” in the State-Variable Selection Process

C.D. Johnson, University of Alabama in Huntsville

WED, 11:30 > Role of Modeling and Simulation in the Bid and Proposal Process

Cynthia Aghamianz, Raytheon Company

DISCOVERY

ARTIFICIAL INTELLIGENCE OVERTURES AND DISTRIBUTED SIMULATIONS

Session Chair: Kevin Reilly, University of Alabama at Birmingham

WED, 1:30 > Expert Systems in First Responder and Medical Simulations

K. D. Reilly, L. J. Jowers and J. R. Hartley, University of Alabama at Birmingham

WED, 2:00 > Distributed Simulation/Animation: Improved Systems and Expert System Roles

K. D. Reilly, J. R. Hartley, P. Gutha and L. J. Jowers, University of Alabama at Birmingham

WED, 2:30 > Expert Systems: Simplifying the use of the Grid

F. A. Hernández, K.D. Reilly, and P. Bangalore, University of Alabama at Birmingham

WED, 3:00 > Utility, Quality of Service Requirements and Economics Modeling for Grid Storage Environments

V. Velusamy, and A. Skjellum, University of Alabama at Birmingham

DISCOVERY

DYNAMIC SYSTEM BEHAVIOR PATTERNS

Session Chair: Kevin Reilly, University of Alabama at Birmingham

WED, 3:30 > Bifurcations and Choosing Population Models

Robert A. Angus, Douglas H. Comstock and John C. Mayer, University of Alabama at Birmingham

WED, 4:00 > Model Validation and Bifurcation Analysis

Robert A. Angus, Douglas H. Comstock and John C. Mayer, University of Alabama at Birmingham

WED, 4:30 > Simulating Continuous Fuzzy Systems Using Matlab/Simulink

L.J. Jowers and J.J. Buckley, University of Alabama at Birmingham

WED, 5:00 > Data Mining and Simulation Approaches in Stroke Rehabilitation Programs

Y. H. Chen, G. Uswatte, K. D. Reilly, and L. Hobbs, University of Alabama at Birmingham

**DISCOVERY
TECHNIQUES**

Session Chair: Thom McLean, Georgia Tech Research Institute

THU, 8:30 > Methodologies for Reducing the Run-Time of Software Models

Ezra Stamper, Jay Harrell and Keith Pimmel, Dynetics, Inc.

THU, 9:00 > Control of Multiple Simulations through a Model Executive Controller

Rusty A. Anderson and D. S. Stauffer, Miltec Missiles and Space Company

THU, 9:30 > Digital Filtering Technique to Reduce out-of-Band Spectrum for OFDM Systems

Khue Ngo-Quoc, Bing W. Kwan and Leonard J. Tung, Florida State University

THU, 10:00 > A Variable Order Interacting Multiple Model Algorithm

Merv Budge, Dynetics Inc.

Kevin Jackson, U.S. Army Aviation and Missile Research, Development, and Engineering Center

Ken Morrison, Dynetics Inc.

John Jordan, U.S. Army Aviation and Missile Research, Development, and Engineering Center

THU, 10:30 > Analysis of Queue-Size Distribution for Fano Decoders

Khalid Darabkh, W. D. Pan, University of Alabama in Huntsville

THU, 11:00 > Queuing Simulation for Sequential Decoders using Discrete-Time Models

*Khalid Darabkh, Hussein Alzoubi, W. D. Pan, University of Alabama in Huntsville
on Company*

**DISCOVERY
SIMULATION IN EDUCATION**

Session Chair: James Nutaro, Oak Ridge National Laboratory

THU, 11:30 > Capitalizing on Student Investments to Interactively Teach Simulation

Ernest Y. Wong, United States Military Academy

**SALON A
GENETIC PROGRAMMING**

Session Chair: Edwin Núñez, COLSA Corporation

WED, 10:30 > Evolutionary Computing as a Tool in Modeling and Simulation

Edwin Núñez, Edwin Roger Banks and Paul Agarwal, COLSA Corporation

Claudette Owens, Marshall McBride and Ron Liedel, U.S. Army Space & Missile Defense Command

WED, 11:00 > Discrimination of Buried Unexploded Ordnance Using Genetic Programming

Edwin Roger Banks, Edwin Núñez and Paul Agarwal, COLSA Corporation

Marshall McBride and Ron Liedel, U.S. Army Space & Missile Defense Command

WED, 11:30 > Evolutionary Programming Approach to Orbital Altitude Solution Determination

T. Craig and D.S. Stauffer, Miltec Missiles and Space Company

SALON A
TACTICAL MISSILE MODELING AND SIMULATION

Session Chair: Keith Jodus, U.S. Army Research, Development, and Engineering Command

WED, 1:30 > The Role of the Common Simulation Framework in the Missile Program Acquisition Cycle

*Blake Haynes and Paul Etheredge, U.S. Army Aviation and Missile Research, Development, and Engineering Center
Danny K. Tollison and Alice W. Salter, Summit Research Corporation*

WED, 2:00 > Semi-active Laser Scene Generation and Sensor Modeling

*David Edgemon, Summit Technologies; Michael O'Melia, Torch Technologies
Jeff Lucas, U.S. Army Research, Development, and Engineering Center*

WED, 2:30 > Avionics Bus Modeling Plugin for Common Simulation Framework

*Wm. Jaye Bass, Torch Technologies
Jeff Lucas, U.S. Army Aviation and Missile Research, Development, and Engineering Center*

WED, 3:00 > Common Scene Generator Current Capabilities and Future Development

*Marsha Drake and Mike O'Melia, Torch Technologies; David Edgemon, Summit Research Corporation
Richard Olson and Dewayne Satterfield, Simulation Technologies
Jeff Lucas and Keith Jodus, U.S. Army Aviation and Missile Research, Development and Engineering Center*

SALON A
UNMANNED SYSTEMS

Session Chair: Mark McDaniel, Science Applications International Corporation

WED, 3:30 > Modeling the Wireless Communication of UAV Ground Station Components

Shawn Constance, David Umphress, Richard Chapman and John A. Hamilton, Jr., Auburn University

WED, 4:00 > An Evaluation of Wireless Security Issues for UAV Ground System Components

Alan A. Hunt and John A. Hamilton, Jr., Auburn University

WED, 4:30 > Framework Independent Toolset for Evaluation of UAV Autonomy Logic

*Eric C. Sholes and J. Mike Cole, U.S. Army Aviation and Missile Research, Development, and Engineering Center
Jason K. Rupert, Matthew N. Davis, Tony D. Colquett, and Justin P. Williams, Dynetics, Inc*

WED, 5:00 > Use of Constructive Simulation for the Evaluation of UAV Autonomy Logic

*Eric C. Sholes, J. Mike Cole and Timothy K. McKelvy
U.S. Army Aviation and Missile Research, Development, and Engineering Center
T. Scott Lemons, SAIC; Jason K. Rupert, Dynetics, Inc*

SALON A
AVIATION AND MISSILE SYSTEM MODELING AND SIMULATION

Session Chair: Sharon Hardy, Computer Sciences Corporation

THU, 8:30 > Simulation of a Guided Interceptor: Developing a 6DOF Projectile Model with Guidance in C++
Philip Hahn and Robert Frederick, University of Alabama in Huntsville; Mark Costello, Oregon State University

THU, 9:00 > Design Considerations for Simulating ABM Systems
Bobbie Leon Foote and Simon R. Goerger, United States Military Academy

THU, 9:30 > GECAT (Graphical Engine Cycle Analysis Tool) Modeler Visual Propulsion Analysis SW Tool Suite
Ken F. Fincher, Jason Back, Casey Johnson and John Nord, SRS Technologies

THU, 10:00 > Break

THU, 10:30 > GECAT (Graphical Engine Cycle Analysis Tool) TERMAP (Turbine Engine Reverse Modeling Aid Program) Visual Propulsion Analysis
Ken F. Fincher, Casey Johnson and John Nord, SRS Technologies; Phillip R. Owen, Rolls-Royce Corporation

THU, 11:00 > High Fidelity Flight Dynamics Simulation & Control
Paul Christian and Norman Brown, Miltec Corporation

THU, 11:30 > Flight Model Enhancement in Support of the UH-60M Upgrade
Kristopher Strobe and Christopher Borden
U.S. Army Aviation and Missile Research, Development, and Engineering Center
Dave Arterburn: Utility Helicopters Project Office
Jay Fletcher, Hossein Mansur and Will Nikonchuk
U.S. Army Aviation and Missile Research, Development, and Engineering Center

SALON B
ATMOSPHERIC MODELING AND SIMULATION
Session Chair: Mike Newchurch, University of Alabama in Huntsville

WED, 10:30 > Tactical Scale Atmospheric Information System
M. Newchurch, A. Biazar, M. Botts, D. Bowdle, K. Fuller, K. Knupp, D. McNider, J. Mecikalski, U. Nair and W. Petersen, University of Alabama in Huntsville

WED, 11:00 > Observational and Modeling Characteristics Required to Apply Weather Knowledge at the Soldier Scale
Dick McNider, University of Alabama in Huntsville; Bill Lapenta, NASA Marshall Space Flight Center
Arastoo Pour-Biazar, University of Alabama in Huntsville

WED, 11:30 > An Integrated Large Eddy Simulation Modeling System for Homeland Security Applications
U. S. Nair, R. Ramachandran, Y. Wu, S. A. Christopher, S. G. Graves, R. M. Welch, University of Alabama in Huntsville
R. A. Pielke Sr., Colorado State University; M. Newchurch and K. Knupp, University of Alabama in Huntsville
Daniel D. Belk and Laurie K. Fraser, U.S. Army Aviation and Missile Research, Development, and Engineering Center
N. L. Goddard, Alabama Department of Homeland Security

WED, 1:30 > Tactical Data Assimilation for Army Applications
John R. Mecikalski and U. S. Nair, University of Alabama in Huntsville

WED, 2:00 > Study of Army Design Hover Criteria

Douglas V. Horacek, US Army Aviation and Missile Command

Mark E. Calvert, US Army Research, Development, and Engineering Center

WED, 2:30 > The NSSTC ARMOR C-band Dual-Polarimetric Doppler Radar: A Tool for Integrated Atmospheric Remote Sensing

Walter A. Petersen, Kevin Knupp, Justin Walters, Wiebke Deierling, Michael Gauthier, Michael Newchurch and Richard McNider, University of Alabama in Huntsville; Richard Blakeslee, NASA Marshall Space Flight Center

WED, 3:00 >Break

WED, 3:30 > Modeling Atmospheric Spectropolarimetric Remote Sensing for Battlespace Simulation and Analysis

K. A. Fuller and M. J. Newchurch, University of Alabama in Huntsville

WED, 4:00 > Using the Grid for the Linked Environments for Atmospheric Modeling and Discovery

Sara Graves, Sandra Redman, and Steve Tanner, University of Alabama in Huntsville

WED, 4:30 > The Use of SensorML and Sensor Web Framework for Sensor Simulation and for Sensor-to-Simulation Connection

Mike Botts, Alexandre Robin, and Anthony Cook, University of Alabama in Huntsville

SALON B

INNOVATIVE TECHNIQUES IN PROCESS AND CONSTRUCTIVE MODELING

Session Chair: Paul Alexander Page, U.S. Army Space and Missile Defense Command

THU, 8:00 > Determining Probability of Detecting, Identifying and Tracking Transporter Erector Launchers

Edwin A. Barber, Jr., U.S. Army Space and Missile Defense Future Warfare Center

Mike Tomlinson, Science Applications International Corporation

THU, 8:30 > Functional Area Analysis Methodology

Chad Daly, U.S. Army Space and Missile Defense Command

Roger Haydel, Science Applications International Corporation

THU, 9:00 > Army Equities in Space - Space Control Constructive Modeling Methodology

Daniel Brian Godwin, U.S. Army Space and Missile Defense Command

THU, 9:30 > Federating Models to Address Real World Issues

Robert C. Williams, U.S. Army Space and Missile Defense Command

John G. Zierdt, Science Applications International Corporation

THU, 10:00 > Military Utility of Blue Force Tracking

Jerry Parowczenko, U.S. Army Space and Missile Defense Command

John G. Zierdt, Science Applications International Corporation

SALON B
COMMAND & CONTROL SIMULATION

Session Chair: Dr. Bruce W. Fowler, U.S. Army Aviation and Missile Research Development and Engineering Center

THU, 10:30 > Applying a Three-Tiered Modeling Approach to the Analysis of Next Generation C4ISR Systems

Roger Smith, Jennifer Iding and Seth Lytle, SPARTA Inc.

THU, 11:00 > MATREX Blue Thread – Networked Effects C2 (NEC2)

Monte Porter, Michelle Herman and John Hughes, Computer Sciences Corporation

Tim McKelvy. U.S. Army Research, Development, and Engineering Center

THU, 11:30 > Process Control and VV&A of Distributed Simulations at Runtime for Network Centric Implementations

Monte Porter, Michelle Herman and Fred Severin, Computer Sciences Corporation

SALON C
SPACE MODELING AND SIMULATION

Session Chair: Steven Fox, U.S. Army Space and Missile Defense Command

WED, 10:30 > Space and Missile Defense's Future Warfare Center Battle Lab Collaborative Simulation Environment Space Node

Scott A. Heise, US Army Space and Missile Defense Future Warfare Center

WED, 11:00 > Representing Space-based Capabilities Using the Space Server Concept

Michael T. Davis, US Army Space and Missile Defense Future Warfare Center; Joseph D. Fann, Dynetics, Inc.

WED, 11:30 > Space-based Intelligence, Surveillance, and Reconnaissance for Command, Control, Communications, Computers, and Intelligence Systems

Jeffrey J. Franssen, US Army Space and Missile Defense Command

WED, 1:30 > Space Improvements in Models and Simulations

Alesya Paschal, US Army Space and Missile Defense Future Warfare Center

WED, 2:00 > Simulated Space Based Imagery Technology

Justin R. Novak, US Army Space and Missile Defense Future Warfare Center

WED, 2:30 > Development of a Space Communications Effects Federation (SCEF)

Steven R. Elliott, Jr., U.S. Army Space and Missile Defense Future Warfare Center

Arnold Bard, U.S. Army Communications Electronics Research, Development, and Engineering Center

Joseph D. Fann, Dynetics, Inc.

WED, 3:00 > Six-Degree-of-Freedom Simulation of the Rocketplane XP Space-plane

Kevin Betts, Dr. John Glaese, and Chad Rutherford, bd Systems, Inc.

WED, 3:30 > Precision Gimbal Pointing Models for Jupiter Icy Moons Orbiter Spacecraft

Kevin M. Betts and Scott M. Pollard, bd Systems, Inc.

**SALON C
COMBAT MODELS**

Session Chair: E.L. Perry, Northrop Grumman Information Technology

WED, 4:00 > Air Force Modeling and Simulation Technical Standards Process and Procedures Tool

William Oates, Air Force Agency for Modeling and Simulation

Donna A. Groden, Northrop Grumman Corporation

WED, 4:30 > Course of Action Comparison During Adaptive Planning

E. L. Perry, Northrop Grumman Information Technology

WED, 5:00 > M&S for Critical Thinking and Performance: The Affective Domain

Sharon Sloane, WILL Interactive, Inc.

**SALON C
HOMELAND SECURITY**

Session Chairs: Dr. Gary Workman, University of Alabama in Huntsville

Mary E. Ottman, U.S. Army Aviation and Missile Research, Development, and Engineering Center

THU, 8:30 > Applying Military Simulation Technology to Homeland Defense

Dan Belk, U.S. Army Aviation and Missile Research, Development, and Engineering Center

THU, 9:00 > Off-Shore Short Range Ballistic and Cruise Missile Defense

David W. Hatchett, Defense Acquisition, Inc.

THU, 9:30 > Re-Creation of London Bus Bomb Attack

Frank B. Tatom, Engineering Analysis Inc.; D. Bart Justice, Axios Solutions, Inc.

THU, 10:00 > Contamination Avoidance Detector Test Suite Project Active Dynamic Spectral Projector

Arthur R. Maret, ATSS Inc.; Tamara Truong, NAVAIR Training Systems Division

**SALON C
HOMELAND DEFENSE/FORCE PROTECTION**

Session Chair: Joe Moran, U.S. Army Aviation and Missile Research, Development, and Engineering Center

THU, 10:30 > Simulation-Based Emergency Response Training

Vicki Johnston, Science Applications International Corporation

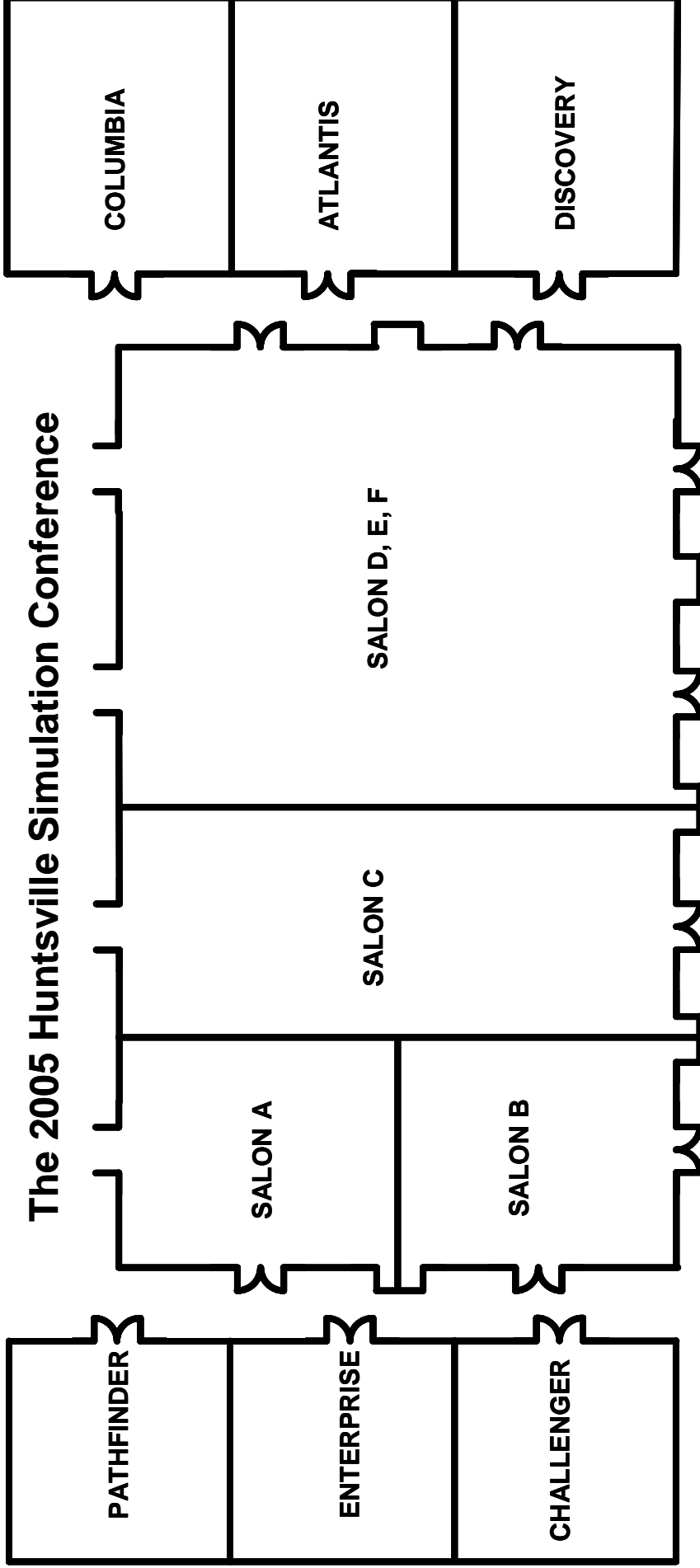
THU, 11:00 > Inserting Integrated Unmanned Systems into a Simulated Homeland Defense/Force Protection Environment

Gary A. Maddux, University of Alabama in Huntsville

THU, 11:30 > Vehicle Traffic Server for Force Protection Simulations

Mindy Newbauer, U.S. Army Aviation and Missile Research, Development, and Engineering Center

The 2005 Huntsville Simulation Conference



EXHIBITORS

AEgis Technologies Group
Applied Dynamics International
Boston Dynamics
Computer Sciences Corporation
DiSTI
MultiGen-Paradigm
Aviation Technical Test Center (ATTC)
Space and Missile Defense Command (SMDC)
The University of Alabama in Huntsville Professional Development

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	8:00	Registration									8:00	
		SALON A,B, C - PLENARY SESSION										
	9:00	<i>Military Modeling & Simulation: Imagine the Next Level of Interoperability</i> Colonel Jerry A. Glasow, Director, Defense Modeling and Simulation Office (DMSO)									9:00	
W E D N E S D A Y	Room	PATHFINDER	ENTERPRISE	CHALLENGER	COLUMBIA	ATLANTIS	DISCOVERY	SALON A	SALON B	SALON C	Room	
	10:00	break			COMMUN- ICATIONS	break						10:00
	10:30	VISUAL- IZATION	CSM	HITL TUTORIAL		FRAME- WORK TUTORIAL	METHODS	GENETIC PROGRAM- MING	ATMOS- PHERIC	SPACE	10:30	
	11:00										11:00	
	11:30	11:30										
			SALON D, E, F - LUNCHEON									
		12:00	<i>Beneath the Forest: The Ancient Maya Landscape From Space</i> Thomas L. Sever, Remote Sensing/Archeologist, Earth Systems Science Office, NASA-Marshall Space Flight Center									12:00
	1:30	TRANSPOR- TATION	CSM	MARINE PANEL	LOGISTICS TUTORIAL	C++ TUTORIAL	AI	TACTICAL MISSILE	ATMOS- PHERIC	SPACE	1:30	
	2:00										2:00	
	2:30		2:30									
3:00	CFD		break		MILITARY MODELING	V&V	DYNAMIC BEHAVIOR	UN- MANNED	COMBAT MODELS	3:00		
3:30										3:30		
4:00	4:00											
4:30	4:30											
5:00	5:00											
5:30	EXHIBIT AREA - EXHIBITORS' RECEPTION									5:30		

	8:00	Registration									8:00
	8:30	AGENT BASED	ENVIRON- MENTAL	COLLAB- ORATIVE	LOGISTICS	BIOMED	TECH- NIQUES	AVIATION AND MISSILE	PROCESS AND CONS- TRUCTIVE	HOMELAND SECURITY	8:30
	9:00	break									break
	9:30	break			9:30						
	10:00	TEST AND TRAINING	NETWORK MODELING	HITL	break	BIOMED	TECH- NIQUES	break	C2	HOMELAND DEFENSE	10:00
	10:30										10:30
	11:00	11:00									
	11:30	11:30									
		SALON D, E, F - LUNCHEON									
	12:00	<i>The REAL Space Cowboys</i> Ed Buckbee, Former Director of the U.S. Space and Rocket Center									12:00
T H U R S D A Y	Room	PATHFINDER	ENTERPRISE	CHALLENGER	COLUMBIA	ATLANTIS	DISCOVERY	SALON A	SALON B	SALON C	Room
	8:00	Registration									8:00
	8:30	AGENT BASED	ENVIRON- MENTAL	COLLAB- ORATIVE	LOGISTICS	BIOMED	TECH- NIQUES	AVIATION AND MISSILE	PROCESS AND CONS- TRUCTIVE	HOMELAND SECURITY	8:30
	9:00	break									break
	9:30	break			9:30						
	10:00	TEST AND TRAINING	NETWORK MODELING	HITL	break	BIOMED	TECH- NIQUES	break	C2	HOMELAND DEFENSE	10:00
	10:30										10:30
	11:00	11:00									
	11:30	11:30									
			SALON D, E, F - LUNCHEON								
	12:00	<i>The REAL Space Cowboys</i> Ed Buckbee, Former Director of the U.S. Space and Rocket Center									12:00