Preliminary Program

(Revised Sept. 12, 2017)

2017 AlaSim International Conference & Exposition

October 25, 2017

Holiday Inn Research Park, 5903 University Dr., Huntsville, AL 35806, USA

Keynote Speaker:

Tom Barnett
Cyber Technology Principal Investigator
U.S. Army Aviation & Missile Research, Development & Engineering Center
Missile Science & Technology Program

Luncheon Speaker:

Dr. John Thomas Giannini, Jr.
Director
Simulation Laboratory
Alabama College of Osteopathic Medicine

Presented by: The Alabama Modeling and Simulation Council
Conference General Chairman: Joseph S. Gauthier, Raytheon
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CONFERENCE PROGRAM

This Preliminary Program contains a prospective list of topics and abstracts submitted to the conference thus far. The Final Program will be slightly different due to authors withdrawing from the program for any number of reasons. Presentations will be assigned to meeting rooms and time slots in the Final Program. A final conference proceedings DVD will be produced and shipped after the conference, based on information presented at the conference.
CONFERENCE REGISTRATION

Conference pre-registration is conducted through the AlaSim International website at http://www.almsc.org/alasim-international.shtml. Select the Registration link. Pre-registration closes on October 14, 2017. After that, registration is at the on-site rate, at the Holiday Inn Research Park from 8:00 a.m. to 4:00 p.m. on October 25, 2017.
CONFERENCE SPONSORS

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CONFERENCE SPEAKERS

Keynote Session:
“Cyber Modeling and Simulation: Bridging the Gap Between Cyber Effects and Mission Impact”

Wednesday, October 25, 2017, 8:30 a.m.

Tom Barnett
Cyber Technology Principal Investigator
U.S. Army Aviation and Missile Research, Development and Engineering Center
Missile Science and Technology Program

Cybersecurity is one of the newest and fastest growing technical fields. So why can’t anyone tell you definitively what it is or, for that matter, how to measure it? Without a common understanding of what it is and where it fits, how does the M&S practitioner model it? This presentation will explore how to represent cyber as part of a larger system context in order to address the most fundamental question about a cyber-attack...“So what?”

Biography:
Thomas (Tom) Barnett is a Cyber Technology Principal Investigator and subject matter expert for the AMRDEC Missile Science and Technology (S&T) Program. In this role, he is utilizing his extensive weapon system knowledge to develop innovative technologies and processes to secure Army systems from the threat of cyber compromise and to ensure trigger pull confidence and resiliency in a contested cyber environment. He is also a primary member of the RDECOM Cyber Community of Practice (CCoP) and is a member of the Team Redstone Executive Steering Group (ESG) Cyber Working Group.
Mr. Barnett was the recipient of the Cyber Huntsville Excellence in Cyber Management Award at the 2017 National Cyber Summit. He was also a finalist for the Association of the United States Army (AUSA) Redstone-Huntsville Chapter’s Department of the Army Civilian of the Year Award in 2016.

Over the last two years Mr. Barnett served as AMRDEC’s first Cyber Technology Area Lead (TAL) where he established the Cyber Technology Area within the overall Missile Science and Technology (S&T) Program. As the AMRDEC Cyber TAL, he was responsible for integrating all aspects of technologies related to hardware and software cyber security and supply chain risk management (SCRM) into a cohesive program designed to weave cyber security into the DNA of Army weapon systems. Mr. Barnett has collaborated with industry, academia, other Army RD&E Laboratories, FFRDC/UARC/National Labs, other DoD services and PEOs, DARPA, military academies, and even the Energy and Biotech industries to build a solid foundation for his scientific and engineering efforts.

During this period, Mr. Barnett also performed the duties of the System Engineering and Integration (SE&I) Lead and Program Manager for AMRDEC-led Cyber Programs for Program Executive Office for Missiles and Space (PEO MS). By working closely with current programs of record, the office of the Army Acquisition Executive, the TRADOC Centers of Excellence, OSD T&E, and the intelligence community, Mr. Barnett is working to re-engineer weapon systems for cyber resilience without sacrificing mission effectiveness.

Mr. Barnett has 30 years of systems engineering experience in the areas of cybersecurity, system of systems hardware in the loop (HWIL), all-digital constructive simulations, radar and infrared sensors, integrated air and missile defense and short-range air defense. He has a Bachelor of Science in Electrical Engineering from Christian Brothers College in Memphis, Tennessee.
Luncheon Session:
“Medical Simulation: Building Critical Thinking Skills”

Wednesday, October 25, 2017, 12:00 p.m.

**Dr. John Thomas Giannini, Jr.**
*Director, Simulation Laboratory*
*Alabama College of Osteopathic Medicine*

This presentation will describe the simulation experience for first and second year medical students at the Alabama College of Osteopathic Medicine (ACOM) leading to the successful medical simulation competition at the national and international level. The preparation and each process of the simulation experience will be described. This educational process enhances clinical skills, critical reasoning, assimilation of information, generating a differential diagnosis, potential treatment, all of which prepare the students for the clinical years.

**Biography:**
John (Buz) Giannini, M.D., is Director of the Simulation Center and Associate Professor of Internal Medicine at the Alabama College of Osteopathic Medicine (ACOM) in Dothan, Alabama. Dr. “G”, referred to by patients, students and faculty, has been with ACOM for 3 years. As Director of the Simulation Center, he assumes the key role of case development and implementation of encounters and its integration into the curriculum. Dr. G teaches and supervises clinical skills sessions as part of pre-clinical training such as blood drawing, IV insertion, lumbar puncture, ultrasound, suturing, cast & splinting, with an assortment of task trainers. In addition, he gives lectures on Internal Medicine topics such as Cardiology, Pulmonary, Renal, GI and Musculoskeletal topics along with teaching the clinical skills of taking a history and physical exam.
Dr. G played a key role in the development and design of a new, free-standing, 4 bay state-of-the-art simulation center which opened in March of 2017. This new Center of Excellence now provides a simulation experience for every student, each week. With Dr. G’s leadership over the last 3 years, the simulation center has grown to conduct its own in-house simulation competition consisting of teams of 4 students performing in a high-risk medical environment. The winning teams have gone on to successfully compete at both the national and international levels of competition.

Dr. G received his MD from the University of Louisville, Louisville, Kentucky. He completed 3 years postgraduate training in General/Trauma Surgery at Shands Jacksonville in Jacksonville, Florida. This was followed by a 3 year Internal Medicine Residency at the same institution. He then completed a post-residency year acting as Chief Resident with administrative and teaching responsibilities. Prior to medical school, Dr. G completed a Physician Assistant (PA) program at Duke University and practiced as a surgical PA for 3 years, initially fueled by being a hospital corpsman in the Navy for 4 years.
As simulation models increase in complexity, the importance of understanding the uncertainty in both the simulations and physical experiments goes up significantly. However, using model calibration and validation, it is possible to quantify how close simulations are to reality. Building on the overview presented at an earlier session, this tutorial will use a live case study of a catapult to sequentially walk through the processes used to quantify uncertainties for simulations and physical experiments using model calibration and validation.

The session will start with the development of two designs of experiments (DOEs); one for the simulation model and other for the physical test. The simulation model will then be used to run its DOE prescribed points and the results of those used develop a surrogate model. The surrogate model will be used to perform parameter sensitivity analysis and determine the projectile distance uncertainty of the surrogate model. For the physical testing, members of the audience will use the physical DOE and collect data live by catapulting foam balls and measuring the distance covered. Finally, the projectile model will be calibrated and validated with the physical data.

The audience for this briefing would be engineers and managers involved in or overseeing simulation design and analyses and experimental analyses. Attendees should leave with an understanding of how to apply statistical calibration to their combined simulation and testing environment and to be able to understand the fundamental value that statistical calibration brings.
The purpose of this course is to bring awareness of the need for continued vigilance of emerging and reemerging infectious diseases and the consequences of failing to do so. This presentation will highlight key elements used in the University of Alabama at Birmingham (UAB) Office of Interprofessional Simulation for Innovative Clinical Practice's biosafety and infectious disease response awareness and operations level training. Various infectious disease resources will be introduced and demonstrations of the recommended process for donning and doffing Personal Protective Equipment (PPE) for a suspected Ebola Virus Disease (EVD) patient will be provided. Other resources will be made available to participants including rubrics and checklist used in evaluating donning/doffing procedures and the donning/doffing observer. After the demonstration, participants will be encouraged to ask questions and review the PPE kits used in the demonstration. Additional kits will be available for viewing.

The intended audience for this training includes those working in direct and in-direct patient care roles in the healthcare environment, infection control managers at hospitals and health care facilities, as well as those responsible for education and training staff at their institution.
The increasing use of modeling and simulation software in defense and medicine and the increasing importance that software plays in solving critical problems motivates the need to identify and understand software development challenges related to its development. Because of the variety and complexity of the underlying domains, existing software engineering tools and techniques, developed initially for the business/IT community, may not be efficient or effective. The goal of this workshop is to assemble members of the modeling and simulation community working on defense and medical applications to discuss issues related to software development. Specifically, participants will identify challenges faced by developers of this software and solutions that developers have tried to address those challenges.
BRIEFINGS

AVIATION, MISSILES AND SPACE
Session Chair: TBD

“AVIATION SYSTEM OF SYSTEM ANALYSIS TOOLKIT”
John V. Smith
US Army Aviation and Missile Research, Development, and Engineering Center
Julian C. Olander
US Army Aviation and Missile Research, Development, and Engineering Center

CYBERSPACE AND SECURITY
Session Chair: TBD

“CYBERSECURITY ISSUES IN THE AUTOMOTIVE INDUSTRY”
Dietmar P. F. Moeller
Clausthal University of Technology
Roland E. Haas
QSO Technologies
Bernard Schroer
University of Alabama in Huntsville

“MODELING CYBERATTACKS WITH PETRI NETS: RESEARCH PROGRAM OVERVIEW AND STATUS REPORT”
Mikel D. Petty
University of Alabama in Huntsville
Tymaine S. Whitaker
University of Alabama in Huntsville
John A. Bland
University of Alabama in Huntsville
Katia P. Mayfield
Athens State University
“VALIDATING PETRI NET MODELS OF COMMON ATTACK PATTERN ENUMERATION AND CLASSIFICATION”

John A. Bland
University of Alabama in Huntsville

Katia P. Mayfield
Athens State University

Mikel D. Petty
University of Alabama in Huntsville

Tymaine S. Whitaker
University of Alabama in Huntsville

“AN OVERVIEW OF MODELING CYBERATTACKS WITH PETRI NETS”

Katia P. Mayfield
Athens State University

Mikel D. Petty
University of Alabama in Huntsville

Tymaine S. Whitaker
University of Alabama in Huntsville

John A. Bland
University of Alabama in Huntsville

“MODELING CYBERATTACK PATTERNS IN FAULT TREES”

Tymaine S. Whitaker
University of Alabama in Huntsville

John A. Bland
University of Alabama in Huntsville

Katia P. Mayfield
Athens State University

Mikel D. Petty
University of Alabama in Huntsville

THE GROWING COMPLEXITY OF CYBERSECURITY

Session Chair: TBD

“DEFENDING SPACE AND MISSILE DEFENSE COMMAND SIMULATION CENTER BORDERS”

Lisa Vann
U.S. Army Space and Missile Defense Command

Kim Hill
Sentar

Defense Command
“CYBER AND ELECTRONIC WARFARE: THE FUTURE IS NOW”
Bryant Glando
Athena Technology Group

ELECTRONICS
Session Chair: TBD

“THE DEVELOPMENT OF A SINGLE-PHASE INVERTER FOR PHOTOVOLTAIC SYSTEMS”
Insu Kim
Alabama A&M University
Shanquila Carter
Alabama A&M University
Asiana McKinney
Alabama A&M University
Keonte Williams
Alabama A&M University

HUMAN BEHAVIORAL MODELING
Session Chair: TBD

“TOWARDS A FEASIBILITY STUDY TO IDENTIFY KEY FACTORS IN PUBLIC PERCEPTION OF BOKO HARAM ACTIVITIES IN NIGERIA”
Fortune Mhlanga
Lipscomb University
E.L. Perry
Faulkner University
Elizabeth K. Noonan
University of Mississippi
W. Alan Cantrell
Lipscomb University
Kyle Killian
Lipscomb University
Ifeyinwa Ajah
Ebonyi State University
Emeka Agwu
Ebonyi State University

Joseph Igwe
Ebonyi State University

Robert Kirchner

MARITIME CONTAINER SHIPPING
Session Chair: TBD

#7 “MARITIME VESSEL DYNAMICS MODELING”
Dillon Malone
Torch Technologies Inc.

Jamie Burns
Torch Technologies Inc.

MEDICAL MODELING AND SIMULATION
Session Chair: TBD

#5 “MODELING AND SIMULATION FOR EDUCATION AND TRAINING IN MEDICINE”
Dietmar P. F. Moeller
Clausthal University of Technology

Hamid Vakilzadian
University of Nebraska-Lincoln

Bernard Schroer
University of Alabama in Huntsville

#9 “INTEGRATION OF TELPRESENCE TECHNOLOGY INTO SIMULATION TRAINING SCENARIOS: THE NEXT STEP IN A SUCCESSFUL SIMULATION BASED EXPERIENCE FOR TRAINING NURSING STUDENTS”
Lori Lioce
University of Alabama in Huntsville

Dietmar P.F. Moeller
Clausthal University of Technology
#22 “A COMPREHENSIVE SYSTEM FOR MASS CASUALTY EDUCATION, TRAINING, TRIAGE, TELEMETRY, AND TRACKING”
Jeremy White
Via College of Osteopathic Medicine
Fred Rawlins
Via College of Osteopathic Medicine
Harold “Skip” Garner
Via College of Osteopathic Medicine
Darlene Myles
Via College of Osteopathic Medicine
Joseph Bauer I
Via College of Osteopathic Medicine
Bruno Moraes Edward
Via College of Osteopathic Medicine

SCENE GENERATION
Session Chair: TBD

#10 “DYNAMIC THERMAL MATERIAL PROPERTY MODELING BASED ON WEATHER CONDITIONS AND TERRAIN COMPOSITION”
Paul Etheredge
U.S. Army Aviation and Missile Research, Development, and Engineering Center
Matthew Rigney
U.S. Army Aviation and Missile Research, Development, and Engineering Center
Jamie Burns
Torch Technologies
Bradley Seal
Torch Technologies
Maisey Morgan
Torch Technologies
SIMULATION IN EDUCATION
Session Chair: Mark Andrews, SmartUQ LLC

#3 “SIMULATION OF TWO NOVEL DEFECTED GROUND STRUCTURES WITH SONNET SUITE SOFTWARE”
Shujun Yang
Alabama A&M University

TEST AND EVALUATION
Session Chair: TBD

#13 “SIMULATION SLOWDOWNS: THREE COMMON PROBLEMS AND HOW TO OVERCOME THEM WITH STATISTICAL METHODS”
Mark Andrews
SmartUQ LLC

TRAINING
Session Chair: TBD

#19 “TRANSITION OF MILITARY UNMANNED AIR SYSTEMS TRAINING AND SIMULATION TO THE COMMERCIAL DRONE COMMUNITY”
Tony Dickson
AEGis Technologies Group
UG Wilson
AEGis Technologies Group

VERIFICATION, VALIDATION AND ACCREDITATION
Session Chair: Alleen Bray, Aegis Technologies Group

#11 “QUANTIFYING THE UNCERTAINTY IN SIMULATION MODELS WITH STATISTICAL CALIBRATION AND VALIDATION”
Mark Andrews
SmartUQ LLC
CERTIFIED MODELING AND SIMULATION PROFESSIONAL RECERTIFICATION UNITS

This conference qualifies for Recertification Units (RU's) for the Certified Modeling and Simulation Professional (CMSP) as administered by the Modeling and Simulation Professional Certification Commission (MSPCC – www.SimProfessional.org).
The Alabama Modeling and Simulation Council (AMSC) wishes to thank and acknowledge the following individuals and their respective organizations for their contributions to the success of this conference:

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