



Tutorials



TUTORIALS

Monday, 28 November 2011

📖 All Tutorials are eligible for CEU credits. (See page 13) 📖

OPEN TO ALL ATTENDEES.

I/ITSEC Tutorials are designed to serve three purposes:

- provide foundational educational material, including material essential to prepare for Certification as a Modeling and Simulation Professional (CMSP);
- serve as a refresher and more advanced learning opportunity for those seeking to maintain their certification; and
- bring topics of special interest in Training, Simulation and Education to I/ITSEC attendees.

TUTORIALS SCHEDULE

Room	Track/Chair	0830 - 1000	1245 - 1415	1430 - 1600
W307 AB	Track 1	M&S 101: Introduction to Modeling and Simulation (1156)	M&S Compliance: Export Basics Reform and the Simulation Industry (1103)	SCORM 2004 for Instructional System Designers: Best Practices (1122) → 📖
W304 A	Track 2	Generic Methodology for Verification and Validation: A Quick-Start (1104) 📖	Model Verification and Validation Methods (1101)	Assessment Architectures to Support Development and Validation of Adaptive Training (1150)
W307 CD	Track 3	Why Games Work – The Science of Learning (1113) 🗣️ 📖	Deconstructing Game-based Systems: What are They? What Really Matters? (1116) 📖	Mobile and Cloud-based Simulation (1139) 📖
W304 B	Track 4	Fundamentals of Modeling and Simulation (1155)	Distributed Simulation Fundamentals (1143) 🗣️	M&S 201: Special Topics in Modeling and Simulation (1151)
W304 E	Track 5	Simulation Conceptual Modeling (1123) →	Speech-based Interaction for Serious Games and Virtual Training Simulators (1111) →	Training for Cyber Warfare (1142) 🗣️
W304 F	Track 6	HLA 101: Introduction to High Level Architecture (HLA) (1154) 📖	TENA and JMETC: Building the Future Test and Training Environment (1132) 📖	HLA 201: What's New in "HLA Evolved" (1157) → 📖
W304 G	Track 7	Cognitive Neuroscience for Military Education and Training (1115) 🗣️	Introduction to Cognitive Architectures for Modeling & Simulation (1144)	Instructional Strategies Framework for Training Systems: Practical Recommendations for Developers (1153)
W304 H	Track 8	Understanding the Healthcare Simulation Development Lifecycle (1131) 🗣️	Creating an Interoperability Architecture Supporting Healthcare Simulation (1109) 🗣️	Integrating Socio-Cultural Domain Models with Existing Simulation Capabilities (1118) 🗣️

LEGEND (one or more of the following may appear on this page). The number in parentheses following Tutorial Title is the ID tracking number.



Nominated for Best Tutorial Award



Honorable Mention for Best Tutorial Award



International Author



Healthcare-related Subject Matter



Standards-related Subject Matter



Game-related Subject Matter

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TRACK: 1
0830-1000
ROOM W307AB

M&S 101:
Introduction to
Modeling and
Simulation
(1156)


MS 101 presents basic Department of Defense (DoD) Modeling and Simulation (M&S) information. Targeting newcomers to defense M&S, MS 101 helps the newcomer get started and provides a broad familiarization to M&S as it is being used in DoD. MS 101 presents basic M&S terminology and describes the DoD M&S vision and strategy and how these

evolved. The DoD Modeling and Simulation Management Plan is described in detail, to include a layman's description of the Global Information Grid, High Level Architecture, Test and Training Enabling Architecture, and Data Discovery. The presentation addresses issues on representation of the natural environment, systems, and humans and organizations; Verification, Validation, and Accreditation (VV&A); information on current defense M&S programs; and M&S information sources. The target audience is the newcomer to M&S who needs a quick dose of M&S to assist them in becoming more proficient in their jobs. No prerequisite knowledge is needed to attend this tutorial. This tutorial is appropriate for managers at all levels and includes more defense programmatic information than the more technically-focused tutorial, Fundamentals of Modeling and Simulation (1155).

Presenter:

LARRY HARRIS is the Program Manager/Course Director, for the M&S Education Division, located in Alexandria, VA. He joined Alion Science and Technology in January 2002 after a 20 year career in the military, during which he served in a variety of troop and staff assignments in the U.S., Philippines, Germany, Panama, and Korea. Mr. Harris has been involved in a variety of projects since coming to Alion Science and Technology, which include project lead for the development and the presentation of the Army's Simulation and Modeling for Acquisition, Requirements, and Training project. He provides staff support to the Modeling and Simulation Coordination Office's M&S Education Program in program management, and in maintenance and update of M&S education products. He is a lead instructor for the Acquisition M&S Workshop; M&S in Support of the Research, Development, and Acquisition Process; M&S in Support of Test and Evaluation; M&S VV&A; and the Simulation Support Plan. Mr. Harris received a Bachelor of Arts degree in Music and Mass Communication from Norfolk State University, Norfolk, VA in 1984.

TRACK: 2
0830-1000
ROOM W304A

Generic
Methodology for
Verification and
Validation:
A Quick-Start
(1104) 

Solid verification and validation (V&V) is essential to ensure the development and employment of Modeling and Simulation (M&S) assets are fit-for-purpose, cost-effective, and their results do not pose unacceptable real world risks. This tutorial presents a versatile and efficient V&V methodology that can be tailored towards any specific M&S

application, technology and organization to address these issues. This methodology, called Generic Methodology for V&V (GM-VV), is currently in the process of standardization within the Simulation Interoperability Standards Organization (SISO). GM-VV provides a generic and comprehensive V&V approach to support the risk-based, decision-making on the development, procurement, application and reuse of M&S assets.


The tutorial will start with an introduction to the most essential GM-VV principles and concepts; continues with a presentation of basic products, process and organizational components of GM-VV tutorial; and ends with how these generic building blocks can be used to create tailored V&V solutions for M&S organizations and projects alike. Experiences and examples from actual V&V studies are used throughout the tutorial to illustrate the GM-VV. These illustrations will provide the attendees initial hands-on ability to support the implementation and execution of V&V projects within their organization.


Presenters:


DR. MANFRED ROZA is a Senior Research and Development Manager, Training and Simulation Systems at the National Aerospace Laboratory (NLR) in the Netherlands. He holds a MSc and PhD in Aerospace M&S Technology from the Delft University of Technology. Currently, he is the chief editor of the GM-VV product development group inside SISO and technical lead for NATO NMSG-073 task group on GM-VV case studies and associated recommended practices. He is one of the initiators of the V&V Knowledge and Service Center for the Dutch authorities, industry and educational institutes involved in M&S.


DR. JEROEN VOOGD is a member of the scientific staff at the Modeling and Simulation Department of TNO Defense, Security and Safety. He holds a PhD in Computational Physics from the University of Amsterdam in the field of modeling and simulation of biophysical systems on parallel distributed computation platforms.


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 Honorable Mention for Best Tutorial Award

 International Author

 Healthcare-related Subject Matter

 Standards-related Subject Matter

 Game-related Subject Matter

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TRACK: 3
0830-1000
ROOM W307CD

Why Games Work – The Science of Learning

(1113) 🏆 📖

In order to prepare for the future, we need training that is more cost-effective. War-fighters need to learn more, in less time. Fortunately, there have been recent advances in learning theory and game design that may make this possible. Modern research shows that well-designed learning games have the potential to significantly improve both knowledge

and behavior, in less time. However, just because it is possible, doesn't mean it's easy.

This tutorial explores the art and science of both instruction and games. It explains why games work and why games make excellent tools for teaching. It explores fundamental theories of psychology, learning, and motivation and shows how to use them. It explains how games create a powerful experience, called flow, and how that increases motivation and improves learning outcomes. It presents the theories that make games work and the practical techniques that can lead to effective training games.

Presenter:

CURTISS MURPHY is a Project Engineer at Alion Science and Technology, Norfolk, VA. He manages the game-based training and 3D visualization development efforts for the Norfolk based Advanced Modeling and Simulation Technology Operations of Alion. He is responsible for the serious game efforts for a variety of Marine, Navy, Air Force, and Joint Department of Defense customers. He is an author and frequent speaker at conferences and leads the game development team that created the award-winning Damage Control Trainer. He has been developing and managing software projects for 18 years. Curtiss holds a BS in Computer Science from Virginia Polytechnic University.

TRACK: 4
0830-1000
ROOM W304B

Fundamentals of Modeling and Simulation (1155)

Fundamentals of Modeling and Simulation (M&S) is designed by a team of subject matter experts to prepare attendees to understand the wide scope of I/ITSEC presentations and demonstrations. The tutorial provides definitions of widely-used technical terms, while explaining the range and types of models and simulations that are commonly applied

in the M&S domain. Key areas of M&S development and deployment are explained. Major unsolved problems and research areas are described, as well as the major advances reported by industry on the exhibit hall. Other key topics include a review of major simulation architectures (HLA, TENA, DIS), the basics of instructional design, a description of the major standards available for use across the M&S problem space, and a brief presentation of resources that can provide further information.

The tutorial is an adaptation of several formal courses of instruction in the fundamentals of M&S and has been specifically tailored to meet the needs of I/ITSEC attendees: more technically focused than M&S 101: Introduction to Modeling and Simulation (1156), which provides a higher-level overview of Department of Defense (DoD) M&S programs.

Presenters:

DR. JAMES E. COOLAHAN is a Program Manager for Modeling and Simulation, and a National Security Studies Fellow, in the National Security Analysis Department at the Johns Hopkins University Applied Physics Laboratory (JHU/APL). He currently chairs the Modeling and Simulation Committee of the Systems Engineering Division of the National Defense Industrial Association, serves as secretary of the Conference Committee of the Simulation Interoperability Standards Organization. He holds BS and MS degrees in Aerospace Engineering from the University of Notre Dame and the Catholic University of America, respectively, and MS and PhD degrees in Computer Science from the JHU and the University of Maryland, respectively.

DR. S.K. NUMRICH, CMSP, holds an AB, MA and PhD in Physics and worked as a research physicist at the Naval Research Laboratory plying her trade in a variety of fields including underwater sound in the Arctic (yes, aboard ship), fluid-structure interactions, parallel processing, modeling and simulation and virtual reality. Currently, Dr. Numrich is with the Institute for Defense Analyses.

DR. ROBERT F. RICHBOURG is a member of the Research Staff in the Joint Advanced Warfighting Division at the IDA. He is a retired Army officer who earned his PhD in Computer Science in 1987. In his last active duty assignment, he was an Academy Professor and Director of the Artificial Intelligence Center at the United States Military Academy, West Point.

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➔ International Author

🏥 Healthcare-related Subject Matter

📄 Standards-related Subject Matter

🎮 Game-related Subject Matter

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TRACK: 5
0830-1000
ROOM W304 E

**Simulation
Conceptual
Modeling**
(1123) →

With the economical efficiency constraints and the increased complexity of needs, simulations are called on to grow, persist and be reused. As a maturation of the simulation science, conceptual modeling is a means to foster interoperability and facilitate life cycle management. It allows the ability to design and document simulation capabilities from an

understanding and an agreement at the conceptual level between simulation users and developers. This bridge between requirements and specifications is the foundation for measuring the fitness for purpose at the origin of the verification and validation of a simulation.

This tutorial provides an overview of the conceptual modeling domain, from fundamentals to applications and from planning to development. The presentation will introduce: the rationale for including conceptual modeling as a center piece of a simulation effort; the scope of a conceptual model among related topics; the construct of a conceptual model; the roles of the stakeholders; and the place of conceptual modeling to the overall simulation enterprise.

Presenters:

NATHALIE HARRISON is a defense scientist at Defence Research and Development Canada – Valcartier since 2000. She received a Bachelor's degree in Engineering Physics from Laval University (Quebec, Canada) in 1998 and a Master's degree in Electrical Engineering from the same university for her research on virtual reality cryosurgery simulation and modeling of heat transfer in human tissues. As part of her work in electro-optical warfare, she specializes in electro-optical systems modeling and weapon engagement simulation. She designed a simulation framework with a conceptual model based on the Model-Driven Architecture to foster international model interoperability and contributed to the TTCF WPN KTA 7-11 on "Munition Model Interface Specification" and she was the Canadian representative on the NATO RTO MSG-058 Task Group on "Conceptual Modeling for Military M&S".

JAKE BORAH is a Senior Member of Technical Staff for AEGIS Technologies Group, Inc. He graduated from the United States Air Force Academy in 1974 and possesses a Master of Aeronautical Science degree from Embry-Riddle Aeronautical University. He has been assigned as Project Manager or Technical Lead on several projects that require a high degree of modeling and simulation expertise and a capability to integrate leading edge technology into ongoing processes.

TRACK: 6
0830-1000
ROOM W304F

**HLA 101:
Introduction
to High Level
Architecture
(HLA)**
(1154) 🖨

The High-Level Architecture (HLA) is the leading international standard for simulation interoperability. It originated in the defense communities but is increasingly used in other domains. This tutorial gives an introduction to the HLA standard. It describes the requirements for interoperability, flexibility, composability and reuse and how HLA meets them.

The principles and terminology of an HLA federation are given including some real world examples. The following is then covered:

- The HLA Object Model Template that is used for describing the data exchange between simulations.
- The HLA Interface Specification that describes the services that simulation can use for data exchange, synchronization and overall management.
- The HLA Rules that federates and federations must follow.

Finally, some practical information is given about where current implementations stand today, including COTS, GOTS and Open Source implementations. The continuous development of performance, robustness of the implementations as well as available tools is also described. Some advice is given on how to get started with HLA, including the use of the related process standard: DSEEP (IEEE 1730).

Presenter:

DR. KATHERINE L. MORSE is a member of the Senior Professional Staff at the Johns Hopkins University Applied Physics Laboratory. She received her BS in Mathematics (1982), BA in Russian (1983), MS in Computer Science (1986) from the University of Arizona, and MS (1995) and PhD (2000) in Information & Computer Science from the University of California, Irvine. Dr. Morse has worked in the computer industry for over 30 years, specializing in the areas of simulation, computer security, compilers, operating systems, neural networks, speech recognition, image processing, and engineering process development. Her PhD dissertation is on dynamic multicast grouping for data distribution management, a field in which she is widely recognized as a foremost expert. Dr. Morse was the 2007 winner of the IEEE Hans Karlsson Award. She is the chair of the SISO Executive Committee.

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🖨 Standards-related Subject Matter

🎮 Game-related Subject Matter


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TRACK: 7
0830-1000
ROOM W304G

Cognitive Neuroscience for Military Education and Training

(1115) 

Advances in cognitive neuroscience have direct bearing on the methods and content of education and training for the armed services. However, these insights are largely inaccessible to practitioners outside the neuroscience domain. The objective of this tutorial is to provide a synopsis of key findings and theoretical advances from neuroscience that may be

applied to improve the quality and content of military instruction. This synopsis entails new insights into factors explaining human performance and, in other cases, elucidates the mechanisms that underlie accepted principles. Particular emphasis will be placed on presenting materials in a manner that may be readily understood and applied by individuals with no formal training in neuroscience. The tutorial will be presented using an engaging, interactive approach that requires participants to use the knowledge they acquire during the tutorial to solve real-world problems.


Topics covered in the tutorial will include: learning and memory, information processing, attention, conscious awareness, individual differences, expertise, and teamwork and collaboration. Through discussion of alternative approaches to neuroscience data collection, participants will be provided the knowledge to be thoughtful consumers of neuroscience research. Finally, the tutorial will summarize developments in operational neuroscience and the use of neuroscience methods and technologies in education and training environments.

Presenter:

CHRIS FORSYTHE holds advanced degrees in Cognitive Psychology and Biopsychology, and is a Distinguished Member of the Technical Staff at Sandia National Laboratories. Mr. Forsythe has over 20 years experience conducting and managing projects applying behavioral and neuroscience principles to improve human performance. He has taught a variety of short courses and workshops through Sandia National Laboratories corporate training and development and the Department of Energy Nuclear Weapons Surety Program.

TRACK: 8
0830-1000
ROOM W304H

Understanding the Healthcare Simulation Development Lifecycle

(1131) 

Simulation is gaining widespread acceptance in the field of healthcare, and many healthcare accreditation organizations are requiring simulation-based assessments in order for physicians, nurses and other clinicians to earn specialty certifications. In addition, healthcare simulation is being used for continuing professional education so

practicing healthcare professionals can acquire new skills or practice current skills in a safe environment. The development of a reliable and valid healthcare simulation that is sustainable requires a lifecycle development methodology that is unique to healthcare. This tutorial presents a healthcare simulation lifecycle model developed by the Veterans Health Administration's (VHA) National Simulation Learning Education and Research Network (SimLEARN) Center located in Orlando, Florida. The SimLEARN lifecycle model can be used by DoD or civilian healthcare organizations to develop healthcare simulations that meet the core competencies and accreditation requirements of the healthcare industry.


Presenters:


DR. HARU OKUDA is the National Medical Director for SimLEARN. Prior to this role, he was the Director of the Institute for Medical Simulation and Advanced Learning (IMSAL) for the NYC Health and Hospitals Corporation and held a position as Associate Professor of Clinical Emergency Medicine at the Mount Sinai School of Medicine. He received his MD from New York Medical College and completed his training in Emergency Medicine at Mount Sinai Emergency Medicine Residency and recently finished a Clinical Quality Fellowship with the Greater New York Hospital Association/United Hospital Fund.


DR. LYGIA ARCARO, RN, BC, is the National Director of Nursing Programs for SimLEARN. In this role, she serves as a member of the leadership team working with a multidisciplinary team of clinicians and educators to develop learning opportunities for staff using state-of-the-art simulation learning technology for the VA.


DR. WILLIAM L GAUGHT is the Curriculum Developer and the creator of the simulation healthcare lifecycle model used at SimLEARN. In this position, Dr. Gaught is responsible for taking clinical training requirements within the VHA and developing curriculum that incorporates healthcare simulation.


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TRACK: 1
1245-1415
ROOM W307AB

M&S Compliance: Export Basics Reform and the Simulation Industry (1103)

This tutorial will focus on recent changes to the U.S. export laws as a result of the Obama administration's Export Control Reform initiative as well as provide a basic foundation for understanding the application of the U.S. export laws to the modeling and simulation industry. As U.S. Government enforcement efforts continue to increase with a particular

focus on cutting-edge technology that provides a military advantage, such as modeling and simulation, industry participants must be aware of the export requirements that govern their business and the coming changes to the U.S. export laws. International joint ventures and subsidiaries, globalization of the industry, cooperative military efforts and interoperability requirements with allies and coalition partners have increased the interaction between U.S. companies and the world and most interactions in the simulation arena trigger some aspect of the U.S. export laws. Participants will understand the scope of the U.S. export laws, anticipated changes and reform, how the U.S. Government applies them to the simulation industry, to include controls on software, hardware, services and activities at trade shows such as I/ITSEC, as well as strategies for ensuring compliance in commercial, U.S. government and foreign contracts.

Presenter:

JEREMY HUFFMAN is a Partner and Founder of Huffman Riley Kao PLLC, a law firm that specializes in assisting clients to understand and address the requirements of the U.S. export laws. The firm advises a number of clients in the modeling and simulation industry and focuses on ensuring that compliance requirements are satisfied in parallel with business concerns.

TRACK: 2
1245-1415
ROOM W304A

Model Verification and Validation Methods (1101)



Verification and validation (V&V) are important essential prerequisites to the credible and reliable use of a model. But what are verification and validation exactly? What are the differences between verification and validation? And most importantly, what methods and procedures should be used to perform V&V? The tutorial's first part motivates



the need for V&V, provides definitions necessary to the understanding of these terms, and explains why all V&V methods can be understood as comparisons and how this informs their application. The second part introduces a taxonomy of V&V methods, defines categories of V&V methods, explains selected methods from each category, and gives example applications of the selected methods. The third part of the tutorial examines longer case studies of V&V in practice, showing how V&V methods have been applied (or misapplied). The tutorial is intended for model developers and testers interested in more formal and quantitative V&V methods and project managers who need to understand the range of V&V methods available and what is required to apply them.



Presenter:

DR. MIKEL D. PETTY is Director of the University of Alabama in Huntsville's Center for Modeling, Simulation, and Analysis and a Research Professor in both the Computer Science and the Industrial and Systems Engineering and Engineering Management departments. He received a PhD in Computer Science from the University of Central Florida in 1997. Dr. Petty has worked in modeling and simulation research and development since 1990 in areas that include: simulation interoperability and composability; human behavior modeling; multi-resolution simulation; and applications of theory to simulation. He has published over 150 research papers and has been awarded over \$14 million in research funding. He served on a National Research Council committee on modeling and simulation, is a Certified Modeling and Simulation Professional, and is an editor of the journals *SIMULATION* and *Journal of Defense Modeling and Simulation*. He was the dissertation advisor to the first two students to receive PhDs in Modeling and Simulation at Old Dominion University.

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TRACK: 3
1245-1415
ROOM W307CD

Deconstructing Game-based Systems: What are They? What Really Matters?

(1116) 

The importance of using simulations and game-based systems to supplement training needs of the military is well recognized. These systems have a potential to save material and human resources, motivate trainees and create training opportunities that go beyond current practices. Harnessing the experiences in using games for entertainment, recent years

have seen a growth in a number of game-based systems being developed and used in training practices of the military. While there is a substantial technical effort underway to deliver these types of systems, knowledge of a wider user community and their thorough understanding of what those systems are, what constitutes them and what should be considered when using them in training, are still lagging.


This tutorial provides a basic yet thorough understanding about game-based systems, their main structural components, and different phenomena connected with the introduction of those systems in training practices. The tutorial is focused on learning needs of military personnel, acquisition specialists, instructors and managers in simulation centers, and others who provide or plan to provide training using game-based systems.

Presenter:

DR. AMELA SADAGIC is a Research Associate Professor at the Naval Postgraduate School, Modeling Virtual Environments and Simulations Institute, Monterey, CA. She has led research efforts on projects sponsored by the Office of Naval Research (ONR), Navy Modeling and Simulation Office (NMSO) and Intelligence Advanced Research Projects Agency (IARPA). These projects involved over 4000 USMC personnel, and focused on novel instrumentation systems and training simulations, evaluation of training effectiveness in virtual training simulations, and the design of training methodologies and pedagogies to be used with virtual training simulations. She was Director of Programs at Advanced Network and Services Inc. where she designed and led the programs focused on the use of emerging technologies in learning, and coordinated National Tele-Immersion Initiative. Her expertise and research interests include: computer graphics and virtual environments, human factors and presence in virtual reality, multiuser collaborative environments, game-based systems, coupling of emerging technologies with systems for training and learning, and diffusion of innovation. Dr. Sadagic holds a PhD degree in Computer Science from the University College London, UK.

TRACK: 4
1245-1415
ROOM W304B

Distributed Simulation Fundamentals

(1143) 

Distributed simulation first appeared in the 1960s with the development of a two-player interactive computer game. In the 1980s, the Defense Advanced Research Projects Agency SIMNET program created the first virtual world for military training by networking combat simulators. Today, distributed simulations, games, and virtual worlds are used not


only by the military, but also by the manufacturing, emergency management, and medical fields.


This tutorial will focus on the fundamentals of distributed simulation systems. It will start with a brief introduction, followed by an overview of computer architectures and networks. Several industry standards have evolved that enable the networking of simulations and games; these will be covered along with their relevant design issues. The tutorial will end with a discussion of the challenges in achieving simulation interoperability. The tutorial is intended for both simulation developers and managers wanting more fundamental information on distributed simulation.


Presenter:


DR. MARGARET L. LOPER is the Chief Scientist for Georgia Tech Research Institute's Information and Communications Laboratory. Margaret has twenty-four years of experience in Modeling and Simulation. Her technical focus is parallel and distributed simulation, and she has contributed to the areas of temporal synchronization, simulation testing, and simulation communication protocols. She earned a PhD in Computer Science from the Georgia Institute of Technology, an MS in Computer Engineering from the University of Central Florida, and a BS in Electrical Engineering from Clemson University.


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TRACK: 5
1245-1415
ROOM W304E

Speech-based Interaction for Serious Games and Virtual Training Simulators

(1111) →

Recent developments have enabled advanced interaction for many applications in which users can more realistically interact with serious games in virtual environments. Unfortunately, mainly because of its complex nature, allowing users to fully interact through speech is a challenge for machine processing, particularly in areas where the task

is unconstrained and performed under adverse conditions. As such, speech often has been neglected as a modality that can enhance the naturalness of interacting with virtual training systems. Furthermore, user-based evaluations of speech interfaces are intrinsically difficult. However, recent research brings hope that, despite these shortcomings, there are several interesting areas and approaches for research and development that could lead to improvements in the design and implementation of training systems.

This tutorial will explain how Automatic Speech Recognition works; the challenges in enabling speech as a modality for hands-free interaction; some usability issues in speech-based interaction systems; opportunities for researchers and developers to enhance system interactivity by enabling speech, and how to enable speech-based interaction within immersive, mixed-reality environments. The tutorial is intended for developers interested in implementing speech recognition in interactive applications, as well as for researchers dedicated to developing methods and systems that allow humans to naturally interact with technology.

Presenters:

DR. COSMIN MUNTEANU is a Research Officer with the National Research Council, Canada – Institute for Information Technology, where he leads several research projects exploring speech and natural language interaction for advanced learning systems and mixed reality training simulators. His area of expertise is at the intersection of Automatic Speech Recognition (ASR) and Human-Computer Interaction (HCI). He has authored numerous publications in HCI, ASR, and Computational Linguistics.

DR. GERALD PENN is an Associate Professor of Computer Science at the University of Toronto, Canada where he is conducting research and publishing in Speech and Natural Language Processing. His area of expertise is the computational and mathematical study of human languages.

TRACK: 6
1245-1415
ROOM W304F

TENA and JMETC: Building the Future Test and Training Environment

(1132) 🖨

The Test and Training Enabling Architecture (TENA) provides an advanced set of interoperability software and interfaces for use in joint distributed testing and training. The TENA software includes the TENA Middleware, a high-performance, real-time, low-latency communication infrastructure used by training range instrumentation software and tools during

execution of a range training event. The standard TENA Object Model provides data definitions for common range entities and thus enables semantic interoperability among training range applications. The TENA tools, utilities, and gateways assist in creating and managing an integration of range resources. The current version of the TENA Middleware, Release 6.0.2, is being used by the range community for testing, training, evaluation, and feedback, and will be used in major exercises in the future.

The Joint Mission Environment Test Capability (JMETC) program is chartered to create a persistent test and evaluation capability throughout the U.S. Department of Defense. JMETC consists of a persistent network; a set of TENA-compliant software middleware, interfaces, tools, and databases; and a process for creating large distributed test events. The combination of TENA and JMETC gives testers and trainers unprecedented power to craft a joint distributed mission environment that meet testing and training requirements for the warfighter.

Presenter:

DR. EDWARD T. POWELL is the lead architect for the TENA. After receiving his PhD in Astrophysics from Princeton University, he worked for the Lawrence Livermore National Laboratory performing simulation-based analysis. He moved to SAIC in 1994, and participated as lead architect in some of the most complex distributed simulation programs in DoD, including the Joint Precision Strike Demonstration, the Synthetic Theater of War, and the Joint Simulation System. He then worked in the intelligence community for two years on architectures for integrating large-scale diverse Intelligence, Surveillance, and Reconnaissance systems. He has been the lead architect for TENA for the past eight years and is currently working on expanding the applicability of TENA, and integrating multiple interoperability architecture approaches using ontology-based systems.

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TRACK: 7
1245-1415
ROOM W304G

Introduction to Cognitive Architectures for Modeling & Simulation (1144)

We are seeing increasing requirements for autonomous reasoning abilities across the broad spectrum of modeling and simulation, as well as in battlefield information and control systems. Additionally, the knowledge-based capabilities that have been developed and tested in simulation are migrating to real-world entities. Cognitive and agent architectures

represent mature computational approaches to intelligence that can implement robust, scalable, and realistic reasoning. This tutorial will provide an introduction to this approach, concentrating on high-level design of human-like reasoning systems. We will draw examples and comparisons from existing architectures, focusing on tradeoffs between cognitive and non-cognitive approaches. The tutorial content does not require any specialized knowledge, but some experience with software engineering or behavior modeling might be helpful. Attendees will learn to recognize problems that suggest cognitively based solutions, and they will be better able to assess risks, costs, and benefits of different approaches. This tutorial is targeted toward developers who might be interested in cognitive approaches to software engineering, as well as customers who have problems that may be amenable to a cognitive approach.

Presenter:

DR. RANDOLPH M. JONES is a Senior Artificial Intelligence Engineer at Soar Technology, Inc., a leading developer of knowledge-rich intelligent agent software. He has been principal investigator for a variety of the company's advanced Research and Development projects funded by Office of Naval Research, Army Research Institute, Air Force Research Lab, Defense Advanced Research Projects Agency and other Department of Defense agencies. He has previously held teaching and research positions at Colby College, the University of Michigan, the University of Pittsburgh, and Carnegie Mellon University. His areas of expertise include computational models of human learning and problem solving, executable psychological models, and knowledge-rich reasoning systems. He earned a BS in Mathematics and Computer Science at University of California, Los Angeles, and a MS (1987) and PhD (1989) degrees from the Department of Information and Computer Science at the University of California, Irvine.

TRACK: 8
1245-1415
ROOM W304H

Creating an Interoperability Architecture Supporting Healthcare Simulation (1109)

There is an active community developing and using virtual simulators in the healthcare field. Department of Defense, Veterans Affairs, and other government entities are also creating and supporting the use of simulators to train individuals and teams. Discussions with various users and developers indicate that it would be beneficial to connect simulators and their components. Illustrations include remote

operation (e.g., where the instructor station is separate from the simulator), hand-off between caregivers using different simulators, delivery of consumables (e.g., whole blood), and integration into a larger environment (e.g., warfare or terrorist act).


This tutorial will describe how the addition of healthcare simulators to the interoperability paradigm is accomplished, the structure of information conveyed between simulators, and additional information, such as images and health records, which are being proposed to enrich the learning experience for all of the constituencies noted above.


Presenters:


BRIAN F. GOLDIEZ is Deputy Director at the University of Central Florida's (UCF) Institute for Simulation and Training. He also leads several multidiscipline research projects and currently directs several programs in healthcare simulation. Dr. Goldiez also led UCF's efforts in starting the conferences that grew into the Simulation Interoperability Workshop and developing IEEE 1278. He holds a doctorate in Modeling and Simulation from UCF.


DR. TERESITA SOTOMAYOR is a Science and Technology Manager for Medical Simulation Technologies at the U.S. Army Simulation and Training Technology Center Human Dimension, Simulation and Training Directorate, Army Research Laboratory. She leads multiple efforts within the Severe Trauma Simulations Army Technology Objective Program and various Small Business Innovation Research projects. Dr. Sotomayor has over twenty years of experience in military modeling and simulation and received her PhD in Modeling and Simulation from the University of Central Florida in 2008.


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TRACK: 1
1430-1600
ROOM W307AB

SCORM 2004 for Instructional System Designers: Best Practices

(1122) → 🖥️

In this 90-minute session we will introduce Instructional System Designers (ISDers) to the general ideas of Shareable Content Object Reference Model (SCORM) and, in particular, the features in the most recent release. It will be a hands-on workshop, in which ISDers will design instruction that is SCORM compliant. Best practices will be presented

to the ISDers for each successive task. We will start out simple (e.g., creating a course with a single lesson, designing for reuse and interoperability) and move to more complex ideas (e.g., remediation and branching and communicating complex navigation ideas with programmers). This tutorial will be highly interactive and ISDers will learn how to design SCORM compliant courses.

Presenters:

DR. BOB POKORNY has worked primarily in the areas of instructional environments and simulation since graduating with a PhD in Experimental Psychology from the University of Oregon in 1979. At Intelligent Automation, he has worked on project integrating instructional standards and documentation standards, simulation-based visualization instruction, and integration of performance aids for continuity with training systems. When working at the Air Force Research Laboratory, he focused on the simulation-based Intelligent Tutoring Systems and expert-system based performance aids.

DR. JACQUELINE HAYNES is co-founder, Executive Vice President and Director of the Education and Training Technology Group at Intelligent Automation, Inc. Her background combines education and psychology with AI applications. She received her PhD from the University of Maryland in Curriculum and Instruction, and did post-doctoral work there in artificial intelligence and intelligent tutoring systems. Previously she was a faculty member at the University of Maryland, College of Education. Her research interests include research-based instructional design, tools for Web-based instruction, and reading comprehension.

DR. ERIC G. SIKORSKI is a Program Analyst with the Technical Support Working Group Training Technology Development subgroup. Eric oversees the development of advanced training solutions, performance support tools, and delivery architectures for various end user organizations including the Department of Defense, Department of Homeland Security, and Department of State. Eric earned his PhD in Instructional Systems from Florida State University.

TRACK: 2
1430-1600
ROOM W304A

Assessment Architectures to Support Development and Validation of Adaptive Training (1150)

Both advances in technology and the use of advanced computational modeling methods in simulations and gaming make these environments attractive for training purposes. The integration of quality assessment design during the development process provides a solid foundation for the design and evaluation of these training systems. This process involves the creation of an

assessment architecture that defines the intended goals of the system through specifications of the domain boundaries, expected responses, descriptions of the tasks, and the constraints of use. Underlying this approach is the idea that the goals of the training system should be defined at multiple levels of specificity and ensures the alignment between the training objectives, simulation and game design, and actual use of the system. This tutorial will provide an overview of this approach to simulation and game design. The approach describes what specific information is needed to make the training objectives operational and useful both for the design and development to support data-driven decision making, and to establish attainable and measurable criteria of effectiveness.

Presenters:

GIRLIE C. DELACRUZ is a senior researcher at the National Center for the Research on Evaluation, Standards, and Student Testing at UCLA. Her research interests lie at the intersection of assessment and learning theory through the use of various forms of technology including computers, video games, mobile devices, sensor-based networks and social media in both military and educational contexts. Her current work investigates the use of various knowledge representations and computational models to support the design and evaluation of technology-based learning and training environments.

MARKUS R. ISELI is a Senior Research Associate at UCLA/CRESST with a focus on integration and application of artificial intelligence algorithms for technology-based learning and assessment systems. Prior to working at CRESST, he was a lecturer for digital speech processing at UCLA. He has 10 years of industrial expertise as a technology consultant and hardware and software engineer. His specialization is in digital signal processing, including speech and image analysis, and probabilistic and logical reasoning using Bayesian networks.

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TRACK: 3
1430-1600
ROOM W307CD

Mobile and Cloud-based Simulation

(1139) 📖

Understanding the implications of a mobile workforce is an important new dynamic, and new technologies are arising to meet this challenge. How can you develop simulations that can be used on mobile devices or in a mobile context to the benefit of your troops, associates, or workers? How can cloud-based content be leveraged through mobile devices to

promote learning?

The session will demonstrate and elaborate on the affordances of mobile simulation for the flexible authoring or re-use of cloud-based content, situated within authentic environments and contexts. Mobile content is delivered (and user performance assessed) via channels such as e-mail, voice, text messages, web, and mobile apps, on devices and platforms that are ubiquitous and familiar.

In this session, you will: see current government and military examples of how mobile technology is being used for training and simulation; explore key technological features and design characteristics unique to mobile; and develop your own mobile strategy. The tutorial will cover information necessary to build and implement a cohesive design and development strategy for mobile training and simulation and is intended for a broad audience – technical, instructional, and managerial. No pre-requisites required.

Presenters:

DR. DAVID METCALF is a Senior Researcher at the University of Central Florida Institute for Simulation and Training (IST). Prior to founding IST's Mixed Emerging Technology Integration Lab, Dr. Metcalf was Chief Learning Technologist at RWD Technologies and Director of the Multimedia Lab at NASA's Kennedy Space Center. As a recognized expert in the international field of mobile learning, he is a frequent invited speaker and consultant on mobile learning best practices, and served as Conference Chair for mLearn 2009, the 8th World Conference for Mobile and Contextual Learning.

ANGELA HAMILTON is a Researcher at the UCF IST. With an educational background in technical communication, Ms. Hamilton has led mobile research and development projects and authored strategy reports for government and industry leaders such as Defense Acquisition University, Microsoft, and Johnson & Johnson. She also served as Academic Coordinator for mLearn 2009.

TRACK: 4
1430-1600
ROOM W304B

M&S 201: Special Topics in Modeling and Simulation

(1151)

M&S 201 is targeted towards the professional who wants to develop a more advanced understanding of the fundamental technologies underlying Modeling and Simulation. M&S 201 focuses on and provides a more in-depth coverage of technical aspects of distributed systems, synthetic environments, and human behavior representations. In particu-

lar, the tutorial compares the primary alternative technologies in each of these three areas with the goal of developing an understanding of the strengths and weaknesses of each approach. Guidelines that characterize when each approach is most appropriate are also developed and presented. The tutorial also presents common pitfalls in each area. Strictly focused on technologies, M&S 201 is intended to build upon, more fully develop, and complement the material presented in "M&S 101" and "Fundamentals of M&S".

Presenters:

DR. MARGARET L. LOPER is the Chief Scientist for Georgia Tech Research Institute's Information and Communications Laboratory. Margaret has twenty-four years of experience in M&S. Her technical focus is parallel and distributed simulation, and she has contributed to the areas of temporal synchronization, simulation testing, and simulation communication protocols. She earned a PhD in Computer Science from the Georgia Institute of Technology, an MS in Computer Engineering from the University of Central Florida, and a BS in Electrical Engineering from Clemson University.

DR. ROBERT RICHBURG is a member of the Research Staff in the Joint Advanced Warfighting Division at the Institute for Defense Analyses. He is a retired Army officer who earned his PhD in Computer Science in 1987. In his last active duty assignment, he was an Academy Professor and Director of the Artificial Intelligence Center at the United States Military Academy, West Point.

DR. AMY HENNINGER is currently a Highly Qualified Expert, serving as the M&S Technical Advisor, Center for Army Analyses. Her past experience includes positions on the Research Staff at the Institute for Defense Analyses, Technical Advisor at the DoD Modeling & Simulation Coordination Office, and as a Senior Scientist at Soar Technology, Inc. She's worked as an analyst, developer, researcher and manager on a variety of DoD M&S programs for over 20 years.

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TRACK: 5
1430-1600
ROOM W304E

Training for Cyber Warfare (1142) 📖

With modern warfighting relying heavily on Network-Centric Operations and wireless communications, cyber threats pose a real and immediate threat to the success of the battlefield missions. To achieve mission assurance, it is imperative that the communication network used in support of the mission be able to operate effectively to support mission-critical ap-

lications, even as the supporting networked architecture is under cyber attack. This tutorial is intended to give an overview of the cyber attack and defense problem from a training perspective. We will begin with a background discussion of the threat, describing the types of attacks that can be leveled against our tactical networks, the conditions enabling these attacks and their impact on a military mission thread. We will continue with a discussion of the requirements for modeling and simulation of cyber attacks and defenses, and the emerging tools and models available to support training warfighters, network administrators, and commanders to recognize and respond to cyber warfare. We will conclude with a case study and demonstration to analyze the performance of a mission thread utilizing a mixed wireless-wired network under a series of cyber attacks including jamming, eavesdropping, distributed denial of service and vulnerability exploitation.

Presenters:

DR. RAJIVE BAGRODIA is a Professor Emeritus at the University of California at Los Angeles and the Founder of Scalable Network Technologies Inc. His scientific contributions have been recognized through the Presidential Young Investigator award from the National Science Foundation, the Outstanding Young Teacher award from the UCLA School of Engineering and Applied Science. Dr. Bagrodia founded Scalable Network Technologies to advance academic innovations into products that solve the network modeling and simulation challenges of DoD and commercial markets. Dr. Bagrodia obtained a Bachelor of Technology in Electrical Engineering from the Indian Institute of Technology, Bombay and a PhD in Computer Science from the University of Texas at Austin.

LLOYD WIHL is Director of Technical Sales at Scalable Network Technologies (SNT), providing worldwide pre-sales support for potential clients, developing system prototypes and technology interfaces, guiding future product development especially in the area of cyber warfare, providing guidance for customer model development, training customers, and managing customer engineering service contracts. Mr. Wihl has 30 years of experience in the Modeling, Simulation and Training industry. His experience prior to SNT includes 24 years at CAE, where he developed system architectures for military simulation and training.

TRACK: 6
1430-1600
ROOM W304F

HLA 201: What's New in "HLA Evolved" (1157) → 📖

This tutorial gives an overview of the new features of High Level Architecture (HLA) Evolved (IEEE STD 1516-2010) which is a superset of the previous HLA standard. It describes the new functionality and what new capabilities it provides to federations. It also gives an overview of the open standardization process behind this new version. Some

key new features include Modular FOMs, extended XML features, Fault Tolerance, Dynamic Link Compatibility, Encoding helpers, Web Services and Smart Update Rate Reduction.

Finally some approaches for migrating existing federations to "HLA Evolved" are given, including notes on tool support. An extensive list of in-depth reading is also provided.

Presenters:

BJÖRN MÖLLER is the vice president and co-founder of Pitch, the leading supplier of tools for HLA 1516 and HLA 1.3. He leads the strategic development of Pitch HLA products. He serves on several HLA standards and working groups and has a wide international contact network in simulation interoperability. He has twenty years of experience in high-tech R&D companies, with an international profile in areas such as modeling and simulation, artificial intelligence and Web-based collaboration. Björn Möller holds an MSc in Computer Science and Technology after studies at Linköping University, Sweden, and Imperial College, London. He is currently serving as the vice chairman of the SISO HLA Evolved Product Support Group.

ROBERT LUTZ is a principal staff scientist at The Johns Hopkins University Applied Physics Laboratory (JHU/APL) in Laurel, MD. He has over 30 years of experience in the design, implementation, and evaluation of M&S systems for military customers. He leads several M&S standards initiatives within the Simulation Interoperability Standards Organization (SISO), including the Object Model Template (OMT) component to the Institute of Electrical and Electronics Engineers (IEEE) 1516 High Level Architecture (HLA) standard, and the IEEE 1730 Distributed Simulation Engineering and Execution Process standard. He also serves as a regular guest lecturer in The Johns Hopkins University Whiting School of Engineering.

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TRACK: 7
1430-1600
ROOM W304G

Instructional Strategies Framework for Training Systems: Practical Recommendations for Developers (1153)

In an effort to improve training efficiency, the military has focused much attention on the development of replicable and generalizable adaptive training systems. As a result, a substantial number of companies and contractors have spent significant time and money developing a large number of training systems. However, there is little evidence to suggest that these devices have the ability to effectively train as stand-alone systems in their current form and

they, therefore, must be augmented by the guidance of an experienced instructor. This tutorial will provide developers with concrete, practical, and research-based instructional strategies that can support the transformation of these devices into training systems through the incorporation of individualized, adaptive instructional strategies. We will begin with a review of the most recent and relevant literature and follow with an analysis of the methodologies and validity of these strategies. A thematic synthesis, in concert with heuristics from educational theory, will then be presented and tangible recommendations for developers of training systems will be provided.

Presenters:

DR. JENNIFER VOGEL-WALCUTT is an Assistant Professor at the University of Central Florida, where she works within the Applied Cognition and Training in Immersive Virtual Environments (ACTIVE) laboratory at the Institute for Simulation and Training. She received her PhD in Developmental Psychology from Florida State University. Her work focuses on increasing learning efficiency in complex environments, particularly within military domains, by creating strategies for more efficient training.

LOGAN FIORELLA is a doctoral student at the University of California, Santa Barbara, where he is pursuing his PhD in Cognitive Psychology. He received his MS in Modeling and Simulation and BS in Psychology from the University of Central Florida, where he worked within the ACTIVE laboratory at the Institute for Simulation and Training. His research is focused on applying principles of cognition to the design of multimedia learning environments, particularly within educational domains.

TRACK: 8
1430-1600
ROOM W304H

Integrating Socio-Cultural Domain Models with Existing Simulation Capabilities (1118) ✍️

Military doctrine has become increasingly concerned with our ability to understand the social structure and cultural norms of populations that differ from our own. Whether engaged in irregular warfare or various stabilization efforts (e.g., humanitarian assistance, disaster relief, partnership building) our focal point is the population. While training through live interaction with expatriate and trained surrogates is extremely

useful, only a fraction of the force can take advantage of this opportunity. It is necessary to provide synthetic training environments with simulations capable of representing not only a credible adversary, but a credible population. This tutorial introduces four factors that impact our ability to seamlessly integrate socio-cultural domain models with existing simulation capabilities. These factors provide the useful function of limiting the amount and type of data required for simulation by placing high importance on its relevancy. The tutorial explores their implications for data collection, model development and use. Two types of appropriate model architecture are introduced: a High Level Architecture (HLA) federation and a data-centric framework. The tutorial closes by taking a closer look at an HLA federation; examining the types of data, servers, and models that make the most sense within this architecture.

Presenters:

DR. S.K. NUMRICH, CMSP, holds an AB, MA and PhD in Physics and worked as a research physicist at the Naval Research Laboratory plying her trade in a variety of fields including underwater sound in the Arctic (yes, aboard ship), fluid-structure interactions, parallel processing, modeling and simulation and virtual reality. Upon leaving government service, Dr. Numrich joined Institute for Defense Analyses (IDA) where her work includes studies in irregular warfare, the impact of cultural awareness on military operations, culturally “aware” modeling and simulation tools, data acquisition and sharing, and the potential uses of participatory media (games and beyond).

DR. P.M. PICUCCI is a Research Staff Member at the Institute for Defense Analyses. He holds an MA in National Security Studies from California State University, San Bernardino and a PhD in Political Science from the University of Kansas. His primary research efforts have centered on non-traditional conflict (irregular warfare and terrorism) and the use of computerized content analysis for the study of Islamic terrorism.

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