



A BOLD APPROACH TO OUTREACH

Modeling and Simulation (M&S) continues to grow in its importance to overall defense preparedness. The Department of Defense Modeling and Simulation Steering Committee, has identified a need to emphasize outreach as a critical tool to achieve its stated communication objectives for Modeling and Simulation.

For its part, the MSIAC is placing new emphasis on Outreach in line with the Department's effort. Over the next days and weeks, the MSIAC will introduce a revitalized outreach effort that will include our web services, M&S Journal, M&S Outreach and selected support of M&S Flagship Events.

This issue of the MSIAC Newsletter is dedicated to recent and upcoming events, technologies and practices that promote and advance M&S practices.

For more information visit the MSIAC website:
<http://www.dod-msiac.org>

On the MSIAC website you will find past issues of the MSIAC Newsletter, information on the Modeling & Simulation Resource Repository (MSRR), an M&S Calendar, and an M&S Link Directory.

TAKING THE POWER OF MODELING AND SIMULATION TO THE WARFIGHTER

*DoD Modeling and Simulation (M&S) Conference
Hampton Roads Convention Center, VA
7-11, May 2007*

The Department of Defense (DoD) M&S Conference is the semiannual event that brings together government executives, military leaders, industry leaders, strategic planners, and senior technical managers to formulate and communicate a common view of how best to use the power of M&S to enhance support to warfighters.

The conference also serves at an important forum for discussing and coordinating future plans, goals and programs within the DoD M&S community.

This conference will be held in conjunction with the following M&S forums: Army and Modeling Simulation Conference, Navy Modeling and Simulation Technical Interchange Meeting (TIM), Air Force Modeling and Simulation Conference, and Connections Conference.

The DoD M&S Conference will highlight perspectives from the warfighter, major program initiatives, and industry with regard to M&S applied to five key organizational concepts: Empowering the Warfighter, Effecting Change, Enhancing Judgment, Elevating Combat Readiness, and Energizing Command & Control.

The conference agenda will include briefings by Senior Government Leaders and representatives of key DoD M&S programs. DoD-level and Service awards for M&S excellence will also be presented.

For more information visit:
http://www.ndia.org/Content/NavigationMenu/Meetings_and_Events/Schedule_of_Events/Events/71M0/DMSC%20Flyer%2007.pdf

SECOND ANNUAL M&S LEADERSHIP SUMMIT: CONGRESSMAN CALLS COMMAND MODELING AND SIMULATION HUB

(CHESAPEAKE, Va. - Feb. 27, 2007) - Congressional Modeling & Simulation (M&S) Training Caucus chairman, Rep. J. Randy Forbes (R-Va.) praised U.S. Joint Forces Command (USJFCOM) and their efforts in the modeling and simulation (M&S) industry Monday.

After Forbes labeled M&S a national security priority in opening remarks during the Second Annual M&S Leadership Summit sponsored by the National Training and Simulation Association (NTSA) here today, he spoke in an interview about the contributions of USJFCOM.

"USJFCOM is the hub of so many different things that are being driven today in modeling and





simulation. I think, certainly, it has been an engine that has kept the private sector going, as well as the government sector in terms of building that architecture that we need in modeling and simulation to get us to where we need to be tomorrow," Forbes said.

"If you look at how it is tying in to future threats that we might have for the United States, USJFCOM has kind of been the bulwark of helping to create jointness in all of our services. I think that they are the prototype for how we do that for our agencies, and I think that's what our next big challenge is," said Forbes.

"When we're dealing with threats around the world, the only way we are able to totally use all of those resources and focus them, I believe, is with modeling and simulation.

That's not just the resources we have militarily - we're moving in that direction now - but that's all the resources we have as a nation, whether that be grain sales or if it be what we can do with aide programs, or whether that's what we can do on a diplomatic front," Forbes said.

For complete article visit:
<http://www.jfcom.mil/newslink/storyarchive/2007/pa022707.html>

Listen to the [podcast](#) with audio from Congressman Forbes and Mr. David Ozolek, Executive Director, Joint Futures Laboratory at Joint Forces Command.

A NEW LOOK AT SIMULATION: IMPROVED SIMULATIONS GEARED TOWARD UNIQUE ELEMENTS AND FUNCTIONS

Simulation used to be viewed as ersatz education—a way of training or modeling that fell far short of the original but was acceptable as a stopgap measure. Now, simulation has advanced to the point where many systems—and even operations—cannot go forward without passing the test of virtual reality. New

hardware is simulated for effectiveness and interoperability, among many criteria, before being accepted into the force. And warfighting operations can be modeled before decision makers even send the force into battle.

Advances in signal processing, graphical display and human-machine interfaces lie behind the maturity of simulation. Moore's Law has made it possible for engineers to count on the enabling of new capabilities about every two years. Both software and hardware improvements are driving the increase in realism seen by users, whether on computers or in virtual environments. But other influences also are driving the changes taking place in simulation.

For many years, the holy grail of simulation and modeling was the fully networked model that would allow every user to join in a virtual realm. Much progress has been made in networked simulations, but now the emphasis is on stand-alone, specific simulation and modeling.

This is a direct result of improved simulation technologies. Engineers now can provide advanced capabilities—previously limited to major simulations and facilities—to individual organizations. All of the services have their own simulation centers that focus on their specific needs. From these centers come service wide systems as well as simulations geared toward unique elements and functions.

For complete article visit:
http://www.simulationinformation.com/cms/index.php?option=com_content&task=view&id=625&Itemid=2

REPRESENTING HUMANS PROVES PROBLEMATIC

Developers strive to create accurate portrayals of behavior, believe breakthroughs loom. Advancements in human modeling soon could improve how military troops train and prepare for missions as well as enhance leaders' abilities to predict how foreign cultures will react to their actions. Scientists and researchers from the military, private



industry and academia are examining how to depict accurately human reactions from a variety of cultures, how to store this information in a database to make it accessible for new developments and how to keep costs and time lines reasonable. Many experts in the human modeling field expect major enhancements and new uses in the next few years.

Human behavior modeling (HBM) is the formal characterization of some aspect of human reasoning and/or performance. The results range from the digital simulations of characters in a video game to charts and graphs that predict behavior.

The HBM field has produced many training and planning tools for the U.S. military, but the resources necessary to create accurate, realistic models still pose a challenge for developers and users. "We right now have the ability to create pretty decent human behavior models. The problem is it's a very expensive proposition," shares Dr. Harold Hawkins, program officer, Office of Naval Research, Arlington, Virginia.

Creating a high-fidelity model currently costs several million dollars. The process is more involved and difficult than creating representations of weapons, vehicles and other objects because of the variations and complexities inherent in humans. Models of weapon systems, for example, will have minor variations and a very tightly grouped set of outcomes. Hawkins explains that modeling humans is more challenging because of the potentially inordinate complexity of the factors that drive behavior and because developers have yet to come to a decision on how to represent the behavior.

Developers also must create models that represent the flexibility and adaptability of human reasoning and behavior. According to Dr. Randolph M. Jones, senior scientist and senior adviser on strategy and technology for Soar Technology Incorporated, Ann Arbor, Michigan, HBM requires creators to specify the adaptation skills at such a formal level of detail that these skills can be executed in a working computer program.

"We can do this because we have faith that even things as fuzzy as human intuition, emotion and creativity are at their heart produced by formal biological and physical processes," he says. "But they are complex, and so it is very difficult to tease out all the complex interactions and knowledge that make human reasoning and behavior possible."

For complete article by Signal Magazine visit:
http://www.afcea.org/signal/articles/templates/SignalArticle_Template.asp?articleid=1274&zoneid=204

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VIRTUAL IRAQ – VR BASED THERAPY FOR POST-TRAUMATIC STRESS DISORDER

Developed by Virtually Better, with funding from the Naval Research Office, "Virtual Iraq" VR environment suitable for therapy of anxiety disorders resulting from the high-stress environment. The treatment involves exposing the patient to a virtual environment containing the feared situation rather than taking the patient into the actual environment or having the patient imagine the stimulus. The virtual environment is controlled by the therapist through a computer keyboard ensuring full control of the exposure to the programmed situations.

The system designed to treat military veterans suffering from Post-Traumatic Stress Disorder (PTSD). Using components from the popular game Full Spectrum Warrior, psychologist Skip Rizzo and his colleagues introduce the patient to a virtual world simulating the sources of combat stress.

The treatment objective is to help veterans come to terms with what they've experienced in places like Iraq and Afghanistan by immersing vets in the sights and sounds of those theaters of battle, including visual and sound effects of gunshots.

Virtual reality exposure treatment allows the therapist to manipulate situations to best suit the individual patient during a standard therapy hour (usually 45-50



mins) and within the confines of the therapist's office.

By gradually re-introducing the patients to the experiences that triggered the trauma, the memory becomes tolerable. Early results from trials suggest virtual reality therapy is uniquely suited to a generation raised on video games.

Virtually Better is using eMagin's [Z800 3DVisor](#) as the medium for delivering the VR exposure, delivering 3D stereovision and sound. Virtually Better applications currently include Virtual Iraq, Virtual Airplane, Virtual Audiences, Virtual Heights, Virtual Storm, and Virtual Vietnam.

For original article visit: <http://www.defense-update.com/products/v/VR-PTSD.htm>

HIGH-FIDELITY SIMULATION: NEW TOOL FOR THE LUNAR PROGRAM

NASA has not landed human-occupied vehicles on another astronomical body for over three decades but is now planning to reestablish a human presence on the Moon. NASA is envisioning many changes and improvements to the next Lunar Lander spacecraft.

For the Apollo missions, a number of devices were used to train the crews for lunar landings, including the Lunar Lander Research Vehicle, called and the "flying bedstead." Since that era, NASA technology has grown to include high-fidelity simulators that will provide a safer and more effective method to develop the Lander design and train astronauts.

High-fidelity full-motion simulation is an essential tool for developing handling qualities for a new class of vehicle such as the Lunar Lander. The need arises from the fact that handling quality assessments rely on subjective evaluations or pilot ratings of the vehicle's flying characteristics (e.g., the Cooper-Harper scale). The NASA SimLabs' Vertical Motion Simulator (VMS) provides a highly realistic environment (motion queues, visualization, and control devices) ideally suited to this type of development.

The 2007 Lunar Lander simulation will include the portion of the landing task beginning approximately two minutes before powered descent initiation and continuing to touchdown, allowing the VMS to encompass three phases of powered descent: the braking phase, the final approach phase, and the landing phase. These phases can be simulated, either as independent segments or as a continuous process. The simulation will also include the ability to inject failures and create other off-nominal landing scenarios, such as take-over of an auto-land feature by the pilot.

VMS engineers are also prototyping a standing restraint system with height-adjustable harness that allows the astronauts to lean forward safely with a locking mechanism for sudden forces. As the Constellation Lander design evolves, the VMS simulation will be continually upgraded to allow development, testing, and training activities to take place during the development process.

For original article visit: http://www.simlabs.arc.nasa.gov/newsletter/news.html#lunar_lander

AFRL RESEARCH TESTS MARS FLYER CONCEPTS

AFRL research continues to play a critical role in the future of Mars exploration. Using the laboratory's Vertical Wind Tunnel (one of only two such facilities in the country), scientists from the Air Force Research Lab (AFRL), the National Aeronautics and Space Administration's Ames Research Center, and the Naval Research Laboratory performed tests on a Mars Flyer model known as MATADOR--the Mars Advanced Technology Airplane for Deployment, Operations, and Recovery.

MATADOR is a versatile, folding-delta-wing vehicle designed for deployment high above the Mars surface; the delta (i.e., triangular-shaped) wings fold in and out, enabling the vehicle's transition from vertical descent to horizontal flight.



The wind tunnel tests simulated low-speed flight, similar to what would be encountered within the Mars atmosphere. The tests not only assisted the researchers in developing flight control algorithms for transitioning the vehicle from vertical descent to horizontal flight, but also allowed them to make key adjustments to the craft and verify computer-simulated data gathered from previous tests.

Throughout testing, the MATADOR model was suspended in the Vertical Wind Tunnel and subjected to upward-blowing winds reaching 14 to 17 mph, an environment which accurately simulated the vehicle's path through the Mars atmosphere during the critical first 30 seconds following the craft's emergence from its aeroshell.

As an unmanned air vehicle concept, MATADOR would fly over the surface of Mars, collecting vital data about the planet's surface and atmosphere. MATADOR would then transmit this information--which might include evidence of water or ice just below the planetary surface, evidence of methane-related processes in the atmosphere, or data pertaining to the structure and turbulent behavior of the atmosphere itself--back to researchers on Earth.

For complete article visit:
<http://www.wpafb.af.mil/news/story.asp?id=123040429>

ENGINEERS 'CAN' DO ANYTHING TO BUILD THE JAMES WEBB SPACE TELESCOPE MODEL

Project part of a week-long series of educational outreach activities

Engineers "can" do almost anything it seems. During the week of Feb 19, they constructed a model of the James Webb Space Telescope out of cans. It was on display at Northrop Grumman Space Technology in Redondo Beach, Calif. It was built to highlight National Engineer's Week.

The model was constructed with 3,234 cans, weighing 2,348 pounds and covering 6 feet by 10 feet by 5 feet as part of the "Cngineering" project, a

part of a week-long series of educational outreach activities. The 20-member team who built it required about 80 man-hours to build the sculpture. The real Webb Telescope is being built by Northrop Grumman to search for the first galaxies or luminous objects formed after the Big Bang, determine how galaxies evolved, and observe the formation of stars.

The model was on display throughout the week, and was then disassembled and donated to Amigos Sin Barreras, a food bank based in Redondo Beach, Calif.

The full-scale JWST model was built by Northrop Grumman to give the viewing public a better understanding of the size, scale and complexity of this breakthrough satellite.

Specifically designed for an environment subject to gravity and weather, the model is constructed mainly of aluminum and steel, weighs 12,000 lbs., and is approximately 80 feet long, 40 feet wide and 40 feet tall. The Webb Telescope is slated for launch in 2013.

For original article visit:
http://www.nasa.gov/centers/goddard/news/topstory/2007/jwst_can.html

ARMY SIMULATION TRACKS SPECIAL OPERATORS' PHYSICAL, MENTAL REACTIONS

In a mountainous landscape, software engineer Jason Mohr guides a virtual U.S. soldier to a narrow wooden bridge, where an Afghan leader meets him. He greets the villager and tries to negotiate passage across the bridge.

As they converse, an instructor monitors the scenario from another computer that receives Mohr's physiological and psychological states from a special wireless headset worn by the player. Red and blue lines chart escalations in his physical and mental responses as Mohr repeatedly is denied permission to cross the bridge.



Such technology is being integrated into a training simulation developed by North Carolina-based Virtual Heroes Inc., for the U.S. Army John F. Kennedy Special Warfare Center and School at Fort Bragg.

The simulation — based on the “America’s Army” gaming technology — already is part of the center’s adaptive thinking and leadership training program, and the biometric measurement capability is being rolled out and tested there this month.

Training soldiers for special operations missions that may include negotiations and other diplomatic situations requires instructors to hone students’ cognitive and interpersonal skills.

Physiological data, such as heart and respiration rates, can clue them in to emotional responses that may have an impact on their performance in real-life settings.

“Our soldiers need to be able to function in extremely high-stress environments, so any experience that we can give them to be better at that, and give them increased self-knowledge about how they tend to respond, will be more effective for them,” says Maj. Edwin Deagle III, senior leadership training developer at the special warfare center and school.

For complete article from National Defense Magazine visit:

<http://www.nationaldefensemagazine.org/issues/2007/March/ArmySimulation.htm>

MSIAC JOURNAL ONLINE CALL FOR PAPERS

The MSIAC is currently accepting articles and papers for our Journal Online. The MSIAC Journal is a quarterly published electronic document of papers by individuals in the US DoD M&S community who wish to publish. It is presented as a forum for new ideas and philosophy coming from the M&S Community.

For information on how to subscribe and/or submit articles/papers to the Journal Online email MSIACHelpDesk@dod-msiac.org or visit: <http://www.dod-msiac.org/journal>

MSIAC ONLINE NEWSLETTER

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