



WELCOME TO THE NOVEMBER / DECEMBER 2011 EDITION of the *Modeling and Simulation Information Analysis Center (MSIAC) M&S Newsletter*. This issue presents a variety of M&S articles and events from communities enabled by M&S within the Department of Defense and beyond.

Please note that although the wording in the excerpts may not always correspond to official DoD usage, the full articles available through the links provide valuable insights into the significant ways that modeling and simulation help foster innovation. We hope you enjoy this issue and welcome your comments.



Born of War

Conflicts Drive Innovation in Medical Simulation

Albert “Skip” Rizzo was inspired to combine virtual reality with medicine by a patient playing a GameBoy. Rizzo was having a difficult time motivating the young boy, who suffered from mental illness, to participate in his exercises. But, the patient was fascinated with the game “Tetris” on the hand-held device.

He was like a ‘Tetris’ warlord,” Rizzo recalled.

Rizzo, who has a Ph.D. in clinical psychology, began hypothesizing about the potential of using games for rehabilitation. Realizing he couldn’t further this idea in the clinical setting, Rizzo returned to academia at the University of Southern California (USC), with the mission of building medical virtual reality simulations. In 2004, Rizzo joined USC’s Institute for Creative Technologies (ICT), where he leads research in medical virtual reality.

The MedVR Lab at ICT employs medical simulation in a variety of ways, such as mental health, motor rehabilitation, virtual patients and neurological simulation. The lab’s mental-health tools, Virtual Iraq and Virtual Afghanistan, are in use for post-traumatic stress disorder (PTSD) rehabilitation at 55 installations throughout the country, including Air Force bases and Veterans Affairs sites, hospitals and clinics. The virtual environments are used for exposure therapy after a patient has had a traumatic experience.

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TRIPLER MEDICAL SIMULATION CENTER ACCREDITATION



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Recently, the lab received funding for a new project called Stress Resilience in Virtual Environments (Strive). Strive leverages the environments from Virtual Iraq and Afghanistan to provide pre-deployment training on emotional coping skills and building resilience. The lab has secured seed funding from the U.S. Army Medical Research and Materiel Command and congressional plus-ups to produce three five-to-10-minute simulation episodes, Rizzo said. He anticipates the Strive project will eventually include 30 episodes spanning the deployment cycle and introducing soldiers to the range of emotional stressors reported by people who undergo treatment for PTSD.

“We’re not aiming to turn people into robots,” Rizzo said. “Instead, we’re trying to give them perspectives and ways to understand and cope with very extreme and horrible things that are part and parcel of war.”

The MedVR Lab is also relaying the technology used in its Virtual Patient project. Initially, the focus was on building virtual patients for clinicians to practice on, complete with artificial intelligence, natural language processing and gestural behaviors. Rizzo said the same concept has been applied to create SimCoach, an online interactive health support character for service members and their families who may be reluctant to seek professional help.

“It’s probably the most advanced intelligent agent that can run on the Web,” Rizzo said. “It’s more than just a chatbot. It’s a character that builds a model of the user to interact with them.”

Users are able to anonymously select a coach and undergo light assessment activities to help them better understand their situation. The SimCoach can guide the user to proper online content specific to military personnel, such as the resources offered by the Defense Department’s Military OneSource website, which Rizzo describes as grossly underutilized.

“All samples say people do a Google search before going to a military-sponsored website,” he said.

SimCoach isn’t meant to replace the clinical setting, but to allow users to dip their toes in the water and understand what help is available, Rizzo said.

This article originally appeared in the Training & Simulation Journal (TSJ). For complete Article, [click here](#).



Gaming Technology Puts Soldiers’ Boots on Ground

As the wars in Iraq and Afghanistan wind down, the Army will be pouring resources into keeping soldiers trained for whatever comes next.

Any training the service can do in a low-cost virtual setting will be a bonus during what is expected to be a cash-strapped decade for the military.

The Army increasingly is turning to the commercial video game industry to create higher fidelity, less expensive and more portable simulations. It turns out that the same technology behind games that pit superhumans against aliens can also help teach soldiers how to conduct a variety of tactical operations.

“We’re not buying Medal of Honor per se, but the engine that drives games like that,” says Fran Fierko, deputy project manager for the Army’s combined arms tactical trainers.

Nowhere is this more evident than in a new product the Army will roll out early next year. The service will pay \$57 million to Intelligent Decisions Inc. to develop the Dismounted Soldier Training System, a set-up that can transform any empty room into a 360-degree virtual combat zone. The service plans to distribute more than 100 Dismounted Soldier trainers to various locations, including to the National Guard. The first two systems will be sent to the Maneuver Center of Excellence at Fort Benning, Ga., in January for user assessments.

Aviators and tank operators have long been using simulators to sharpen their skills. Now, after several years of research, the Army is bringing dismounted troops into the virtual world.

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Gaming Technology Puts Soldiers'...

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“They haven’t had anything for the guy with his boots on the ground, the guy on the streets of Afghanistan clearing buildings,” says Floyd West, Intelligent Decisions’ lead on the program.

Dismounted Soldier employs the CryEngine gaming technology behind Crysis 2, a sci-fi first-person shooter in which the main character fights off extraterrestrials in a futuristic New York City. The original Crysis game featured a U.S. special operator battling otherworldly beings on an island off the Philippines. The influence of these games is taking military simulation far beyond the days when the Pentagon relied on companies to churn out image generators at market-driving rates.

This article originally appeared in the National Defense Magazine. For the complete article, [click here](#).



California Highway Patrol Trains at Combat Center



Officers with the California Highway Patrol mobile field force practice using smoke canisters, simulating using CS gas, during a training event at Range 200, Nov. 9, 2011.

Officers with the California Highway Patrol Mobile Field Force practiced annual crowd dispersal at Range 200, on Nov. 9, 2011, with the help of Combat Center personnel.

The CHP chose the Combat Center for their annual training because of the unique facilities available.

“This is the first time we have come aboard a Marine Corps facility,” said Officer Levi Miller, a mobile field force officer with the San Bernardino County. “We chose this place because a lot of other bases just have an open field for us to go, but it just isn’t realistic.

“This facility you have in the Marine Corps really fits what we need,” Miller added. “It will give the team a sense of what it will be like to hold down an intersection or move a crowd through buildings where people could hide and throw projectiles from.”

To help add more realism to the training, the CHP had volunteer officers and Marines with the Marine Corps Communication-Electronics School and Provost Marshals Office Special Reaction Team act as aggressors in the crowd.

“They threw Nerf balls and tennis balls at us to give our officers a sense of reality,” Miller said. “Hopefully that will remind them that their helmet shields need to be down and that in a real life scenario, a bottle or a rock could be thrown and cause serious damage.”

The officers donned all their gear for the training and reviewed their formations for the multiple scenarios scheduled for the day.

“We have three scenarios that we did where our role players simulated a riotous crowd,” Miller said.

“We used our formations and techniques to separate the crowd into smaller groups. If we can get a crowd separated or pick out a leader or someone who is inciting the crowd, we will separate them from the crowd. Whatever we can do to disperse the crowd.”

This article originally appeared on the U.S. Marine Corps website. For the complete article, [click here](#).





New War Game Developed to Study Army's Impact



An officer shows where his unit operates within the Irregular Warfare Tactical War Game. The simulation is designed to accept new geographical and behavioral data that can allow it to simulate operations anywhere in the world.

Games mean serious business at the Training and Doctrine Command Analysis Center at White Sands Missile Range with the development of a new war game that will help evaluate the social impact of Army operations.

The Irregular Warfare Tactical War Game, being developed at Training and Doctrine Command Analysis Center at White Sands Missile Range, or TRAC WSMR, will be used to assess how Army tactical operations impact the population of a host country. The game system is designed to focus on the tactical level of a battalion sized unit conducting operations in an irregular war.

Keeping the game real, the players use the backdrop of Afghanistan, with maps, objectives, operations and other elements all based on information collected from real world sources. In development since 2008, the Irregular Warfare Tactical War Game has already been used by several organizations to conduct some initial exercises with testing of the fully functional prototype that was expected to be finished in November.

Photo By: John Andrew Hamilton, ATEC

Building the game itself required TRAC to assemble new resources that it previously didn't have. While TRAC had the ability to create basic social interaction models for the game, the details of how those models were to interact with each other weren't there.

"We stood up a whole new organization called the Complex Operations Data Development Activity, hired a number of social scientists, the first social scientists hired within TRAC in 20 years, and those folks are dedicated to developing what we call human social-cultural behavioral data," Works said.

It was this data that, when applied to the game models, allows them to represent the Afghan public and generate the information about how Army operations affect them.

The game, with its large-scale simulated world and focus on the tactical unit, is currently being used to analyze if giving greater intelligence access to a company commander will help the company and battalion level units perform better and win local support faster and more effectively.

To what level intelligence data needs to be disseminated has been a point of discussion across the Army because the intelligence needs of a company commander are typically specific and tactical in nature.

This article originally appeared on the U.S. Army website. For the complete article, [click here](#).

■ ■ ■ Immersed in Training Realistic Settings Help Marines Prepare for Tough Missions

The U.S. Marine Corps is taking realistic training to new heights as it prepares to engage existing and emerging threats around the world. Marine units preparing to deploy to Afghanistan have begun using a new facility at Camp Lejeune, N.C., the \$20 million Infantry Immersion Trainer—a hyper-realistic sound stage in a 32,000 square-foot warehouse that closely replicates the experience of walking into an Afghan village.

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Immersed in Training

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And in a first for the Corps, a live-fire training facility designed to simulate a seagoing merchant ship will be installed on land, making it easier and more cost-effective to practice boarding drills. It's called a "ship on land," and when base officials open the \$8 million trainer in about 18 months, it will mark the latest effort in a push to upgrade training facilities at the Corps' largest East Coast facility.

The new facilities are aimed at preparing Camp Lejeune Marines for current and future battlefields, right in their own backyard.

"The commandant's top priority is to make sure that the Marine forces in Afghanistan are the best trained and equipped forces possible, so my top priority is to support II Marine Expeditionary Force with all their training requirements, whether it's training ranges or the computerized training center we've built," said Brig. Gen. Thomas Gorry, the new commander of Marine Corps Installations East, which oversees facilities such as the IIT and the future ship on land.

These initiatives are part of a broader push across the service to make training more lifelike. Marines at Camp Pendleton, Calif., have trained for deployments in their own Infantry Immersion Trainers for about three years.

Officials at Camp Lejeune tested the IIT earlier this year, and the doors opened to deploying units in mid-October. For many, it is their first taste of Afghanistan. For others, it is a hair-raising reminder of past deployments.

"It was a shock, the realism," said combat veteran Staff Sgt. Casey Olson, the platoon sergeant for 2nd Platoon, Bravo Company, 1st Battalion, 8th Marines, who oversaw the performance of two of his squads in October as they confronted two cultural, tactical and intelligence-gathering scenarios inside the IIT.

Olson and the platoon commander, 1st Lt. Dan Phillips, did a walkthrough of the IIT earlier in the day and, working with the simulator's technicians who concoct the scenarios and incorporate Afghan role players, developed the missions.

"We tried to throw as much friction and confusion into it as possible, things to make them calm down and assess the

situation to make their next move," said Phillips, who will experience his first deployment when 1/8 deploys early next year.

Unlike village scenarios in outdoor environments, the Lejeune IIT is almost completely indoors, shutting out such familiar sounds and sights as traffic and office buildings. The experience starts as Marines enter through a high doorway and see items such as a stone cooking bench, vegetation and a cemetery before entering the interior of the transformed warehouse.

First, you notice the smells. Is it incense? Burning wood? Feces? Vomit? Yes, and more. The simulator has 25 one- and two-story structures, 20 avatar projectors, 20 sound and scent generators and dozens of other atmospheric and set dressings. There are plastic fuel cans, buckets, well pumps, benches, chairs, bicycles, fruit and vegetable carts, a butcher shop with raw meats hanging on big hooks, trees, schools, clinics, homes with internal rooms leading to more internal rooms, all filled with bedding, books and personal items.

This article originally appeared in the Training & Simulation Journal (TSJ). For the complete article, [click here](#).



Getting Serious

Simple, focused games can help develop leaders, but the military has failed to exploit their full potential. Serious-game developer Jim Lunsford offers a solution.

The most important domain for serious games is the military classroom, but for the most part, we have failed to develop and integrate games to adequately support military education. Unless we radically change the methods we employ to develop, acquire and use serious games, we will never fully realize their benefits—especially in teaching and developing leaders.

There are myriad reasons for this. The primary one is that most of us don't really understand games and tend to see them merely as a subset of traditional military simulations.

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Getting Serious

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This is a tremendous misconception that has severely hobbled the development and use of serious games in military schools.

Although some of the games needed for leader development should resemble traditional virtual or military simulations, the vast majority might more closely resemble the simple games we played as children.

The design of an effective serious game must be specifically tailored to support the student's mastery of the primary and secondary learning objectives within the conditions in which the instruction takes place, and not be restricted to how conventional thinking describes a military simulation.

What makes a game effective as an instructional tool, and vastly different from a simulation, is the absence of unnecessary detail. Good serious games either ignore or abstractly model everything that is not directly required to support student assessments, decision-making, or appropriate feedback to the student based on the desired learning objectives. Everything else is not only superfluous but detracts from the game's usefulness because it adds unneeded complexity. Among other things, good serious games must be easy to learn and simple to use because the time required by the student to learn the game is valuable time that could be otherwise used for traditional instruction. In terms of complexity, depth and utility, most serious games used to support leader development and education should be more akin to a mobile application than a traditional military simulation.

“Future Force” and “Forward into Battle” are two examples of serious games that do not resemble the common notion of military simulations. Both were designed and developed in less than eight months to support specific logistics learning objectives at the U.S. Army Command and General Staff College (CGSC). “Future Force” simulates the Army budget and force management during a 20-year period. “Forward into Battle” simulates the movement and resupply of divisional units during reception, staging, onward movement and integration from multiple ports of disembarkation forward to tactical assembly areas.

Although both games model combat, neither models terrain. It's not that terrain isn't important during combat; it is, but the combat within both games is abstractly modeled only as a means to influence students' thinking as they try to solve a complex logistics problem. It is an environmental variable they must consider—not the primary focus of their lessons. Neither game uses a map, except in one case as a background. Instead, the display of critical information is arranged in an unconventional but effective manner that facilitates the rapid assessment of the current situation and supports quick decision-making.

Good serious games provide the powerful “aha!” moment during which the students suddenly, and for the first time, truly understand the essence of the learning objective. It's a powerful lesson because they experience it firsthand as they begin to translate theory into practice. While the practice is in no way as effective as that conducted during live training, it does provide the students valuable insights as to what they might experience when they do perform the task live for the first time.

This article originally appeared in the Training & Simulation Journal (TSJ). For the complete article, [click here](#).



Ancient Dry Spells Offer Clues About the Future of Drought

As parts of Central America and the U.S. Southwest endure some of the worst droughts to hit those areas in decades, scientists have unearthed new evidence about ancient dry spells that suggest the future could bring even more serious water shortages. Three researchers speaking at the annual meeting of the American Geophysical Union in San Francisco on Dec. 5, 2011, presented new findings about the past and future of drought.

Ben Cook, a climatologist affiliated with NASA's Goddard Institute for Space Studies (GISS) and Columbia University's Lamont-Doherty Earth Observatory in New

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Ancient Dry Spells Offer Clues...

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York City, highlighted new research that indicates the ancient Meso-American civilizations of the Mayans and Aztecs likely amplified droughts in the Yucatán Peninsula and southern and central Mexico by clearing rainforests to make room for pastures and farmland.

Converting forest to farmland can increase the reflectivity, or albedo, of the land surface in ways that affect precipitation patterns.

“Farmland and pastures absorb slightly less energy from the sun than the rainforest because their surfaces tend to be lighter and more reflective,” explained Cook. “This means that there’s less energy available for convection and precipitation.”

Cook and colleagues used a high-resolution climate model developed at GISS to run simulations that compared how patterns of vegetation cover during pre-Columbian (before 1492 C.E.) and post-Columbian periods affected precipitation and drought in Central America. The pre-Columbian era saw widespread deforestation on the Yucatán Peninsula and throughout southern and central Mexico. During the post-Columbian period, forests regenerated as native populations declined and farmlands and pastures were abandoned.

Cook’s simulations include input from a newly published land-cover reconstruction that is one of the most complete and accurate records of human vegetation changes available. The results are unmistakable: Precipitation levels declined by a considerable amount—generally 10 to 20 percent—when deforestation was widespread. Precipitation records from stalagmites, a type of cave formation affected by moisture levels that paleoclimatologists use to deduce past climate trends, in the Yucatán agree well with Cook’s model results.

This article originally appeared on NASA’s website. For the complete article, [click here](#).



3-D Simulations of Nova Explosions

A new study has shown how mixing of elements occurs during a nova explosion, thus solving an enigma that has puzzled stellar astrophysicists for over half a century.

Scientists at the Universitat Politècnica de Catalunya. BarcelonaTech (UPC) have for the first time simulated critical phenomena that occur during nova explosions. Their work has made it possible to precisely characterize the physical properties and chemical composition of the material ejected in novae, and this has yielded the solution to an enigma that has puzzled experts for over 50 years: the origin of the irregular, inhomogeneous distribution of nova ejecta.

The paper, published recently in *Nature*, has facilitated analysis of the role these thermonuclear explosions play in the chemical enrichment of the galaxy.

As a result of the complex nuclear phenomena that take place inside stars, the universe has evolved from a chemically poor state—dominated exclusively by the presence of hydrogen, helium, and traces of lithium—to one containing nearly a hundred stable elements. Without the variety of elements now present in the cosmos, the formation of structures like planets and stars and the genesis of live forms—including the calcium in our bones, the iron in our blood, and the uranium we use in our nuclear power plants—would have been impossible. Most of chemical elements originated in supernovae and novae, titanic stellar explosions.

Novae are cataclysmic stellar phenomena that take place in binary systems consisting of a compact stellar object (a white dwarf star the size of a planet but with a mass of up to 1.4 times that of the Sun) and a low-mass star. The stars must be close enough for the intense gravitational field of the white dwarf to tear material away from the outer layers of its companion.

Novae, which are relatively frequent in our galaxy (some 30 to 35 nova-like explosions occur each year), are the third most energetic stellar explosions in the universe, after supernovae and gamma-ray bursts.

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3-D Simulations of Nova Explosions

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Novae and supernovae have been observed by humans for over two thousand years. The way these stars suddenly become much brighter—a change sometimes observable to the naked eye—has given rise to a great variety of conjectures about their origin.

This article originally appeared on the ScienceDaily website. For the complete article, [click here](#).



Tripler Medical Simulation Center Achieves SSH Accreditation

Tripler Army Medical Center's Medical Simulation Center recently achieved the Society for Simulation in Healthcare accreditation.

TAMC is the second simulation center in the Department of Defense to achieve this accreditation and the only one in Hawaii and Pacific region.

Ruth Andrews, the simulation center's administrator, said the center's main focus is graduate medical education

programs, but they support all graduate professional health programs such as nursing, physicians assistant, and even staff training.

The center has a variety of simulators from simple task trainers all the way through the high-fidelity simulators that allow training on many skills.

“The old paradigm used to be ‘See one; Do one; Teach one,’ and now it’s moving toward ‘Simulate one; Do one; Teach one,’” said Maj. Taylor Sawyer, medical simulation director. “This (evolution) is very important (to medical training).”

Sawyer explained that right out of medical school a lot of the residents haven't experienced or performed any procedures.

Andrews said this is why simulation is so important now in medical training facilities.

“In simulation, you can practice as often as you want without risk of injuring anyone,” said Andrews. “You use it to build your skills and your knowledge.”

This article originally appeared on the U.S. Army website. For the complete article, [click here](#).



M&S WHAT & WHEN

MODELING & SIMULATION CALENDAR OF EVENTS

Please visit the complete MSIAC Calendar for a list of events currently scheduled to take place in the M&S community. The complete MSIAC Calendar is available on our website, www.dod-msiac.org/calendar.html.

Upcoming Events

12th International Meeting on Simulation in Healthcare
January 27 – February 1, 2012
San Diego, CA
Simulating the Possibilities

23rd Annual SO/LIC Symposium

February 6 – 8, 2012
Washington, DC
The New World Dynamic: The Changing Roles of Special Operations, General Purpose Forces, and the Interagency

National Modeling and Simulation Coalition

February 6, 2012
Washington, DC
Bringing together constituents and stakeholders using M&S in manufacturing, defense, medicine, energy, transportation and education

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MMVR19/NextMed

February 9 – 11, 2012
Newport Beach, CA
Medicine meets Virtual Reality

28th Annual National Test and Evaluation Conference

March 12 – 15, 2012
Hilton Head, SC
Focusing on the proper role(s) of T&E in our Defense System Requirements Process

2012 Joint CBRN Conference and Exhibition

March 12 – 14, 2012
Baltimore, MD
Beyond BRAC...What's next in CBRN Defense?

Pacific Operational Science & Technology

March 19 – 22, 2012
Honolulu, Hawaii
Regional Shaping with Allies and Partners

Joint Undersea Warfare Technology Spring Conference

March 19 – 22, 2012
San Diego, CA

Smackdown 2012

March 26 – 30, 2012
Orlando, FL
Students build and participate in a simulated lunar resupply mission

2012 GameTech User's Conference

March 26 – 30, 2012
Orlando, FL
Promoting the exchange of knowledge, research, and ideas about the use of gaming technology for education and training purposes

28th Annual National Logistics Conference and Exhibition

March 26 – 29, 2012
Miami, FL
Ensuring Operational Logistics Effectiveness" Balancing Affordability and Risk in a Resource Constrained World

2012 Spring Simulation Interoperability Workshop (SIW)

March 26 – 30, 2012
Orlando, FL

Promote an Event

If you would like to promote an M&S event on the MSIAC Calendar, please email the event information to MsiacHelpDesk@dod-msiac.org.

The M&S Journal



The Winter Issue of the M&S

Journal is here! This issue focuses on M&S Education and Workforce Development.

Additional topics include insight into the value of M&S and innovations in training.

Sign up to receive your electronic copy by sending an

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The *M&S Journal* is a theme-based, quarterly publication of timely articles that highlight M&S technology, applica-

tions, prototype processes or products, points of view, or emerging philosophies.

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The *M&S Journal* is currently accepting paper submissions. All submitted technical papers for the *M&S Journal* undergo rigorous review following an initial screening for conformance to basic requirements. Publishing in the

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M&S Journal affords authors both an online and print forum for their M&S articles, gaining recognition and publicity throughout the DoD M&S community.

Please contact the MSIACHelpDesk@dod-msiac.org for more information, or if you would like to submit an article to the *M&S Journal*.



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