



MSIAC M&S Newsletter

June 2006

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If you would like to submit an article to be highlighted in the *MSIAC M&S Newsletter*, please forward the article (along with its source data and URL, if available) to the MSIAC Help Desk no later than 15 workdays prior to the publication of the next Newsletter. Normally, the Newsletter is published on/about the first of each month. Potential articles as well as questions or comments on the Newsletter can be emailed to msiachelpdesk@msiac.dmsomil.

The MSIAC also publishes the quarterly *MSIAC Journal On-line*. If you would like to see the current issue of the *MSIAC Journal On-line* visit: <http://www.msiac.dmsomil/journal>. If you would like to submit an article for the Journal On-line, please email your paper or article to msiachelpdesk@msiac.dmsomil at least 45 days prior to the next publication date.

UPCOMING EVENTS

6-7 June 2006
[NMSO VV&A Technical Working Group \(TWG24\)](#)
Orlando, FL

6-8 June 2006
[Training and Simulation Industry Symposium](#)
Orlando, FL

9 June 2006
[Geo-Environmental Battle Management Language \(geoBML\) Presentation & Demonstration](#)
Alexandria, VA

12-14 June 2006
[JIDPS/JCATS CCB](#)
Suffolk, VA

13-15 June 2006
[2006 74th MORS Symposium](#)
Colorado Springs, CO

13-15 June 2006
[Modeling and Simulation Staff Officer Course \(MSSOC\)](#)
Redstone Arsenal, AL

19-22 June 2006
[2006 Euro SIW](#)
Stockholm, Sweden

20-22 June 2006
[2006 Command and Control Research and Technology \(CCRTS\) Symposium](#)
San Diego, CA

26-27 June 2006
[Analysis Master Plan M&S Workshop](#)
Alexandria, VA

27-29 June 2006
[US Department of Energy and JCATS Working Group Meeting](#)
Albuquerque, New Mexico

27-29 June 2006
[Joint Theatre Level Simulation \(JTLS\) Configuration Control Board \(CCB\) 2006](#)
McLean, VA

31 July - 3 August 2006
[2006 Summer Simulation Multiconference \(SummerSim' 06\)](#)
Calgary, Canada

31 July - 3 August 2006
[2006 Naval S&T Partnership Conference](#)
Washington, DC

8-10 August 2006
[Modeling and Simulation Staff Officer Course \(MSSOC\)](#)
Orlando, FL

Flash!!! Flash!!!

Defense Acquisition University's Continuous Learning Module (CLM), "Modeling and Simulation for Systems Engineering" is now available and can be accessed at <http://clc.dau.mil>.

There is no fee to take the course. (The courses are listed alphabetically, so look for "Modeling and Simulation." You can "browse" the course or "register" for the course if you wish to receive credit.)

2006 SUMMER SIMULATION MULTICONFERENCE (SummerSim'06)

The 2006 Summer Simulation Multiconference (SummerSim'06) is an annual conference sponsored by The Society for Modeling and Simulation International (SCS) which covers state-of-the-art developments in computer simulation technologies, as well as scientific, industrial, and business applications. Areas covered include high-performance computing technologies, models and algorithms, GUI visualization technologies, communications and much more. Application disciplines covered include advanced telecommunication; computer systems; military, government & aerospace; energy, and other industries. The conference includes keynote speeches presented by technology and industry leaders, technical sessions, professional development courses and seminars, as well as vendor exhibits.

Scientists, engineers, managers, educators, and business professionals who develop or use simulation tools are invited to participate

and present original papers. Proposals are solicited for papers, panels, tutorials, workshops, seminars, exhibits, social activities and for other presentation, discussion and sponsorship formats. People are always welcome to benefit by taking an organizing role. SummerSim'06 offers many ways to promote simulation products and to enhance corporate images. For more information visit:

<http://www.msiac.dmsomil/mscalendar/month.php?cid=&catid=&d=&w=&m=8&y=2006&s>

STOTTLER HENKE TO CREATE MORE ACCURATE BATTLE SIMULATIONS FOR US AIR FORCE

(SAN MATEO, Calif., May 17, 2006) - Easy-to-use AI Planning Tool Will Enable Smarter Computer-Generated Forces and Characters in Computer Games

Seeking more accurate battle planning simulations, the U.S. Air Force has Stottler Henke Associates, Inc. developing an artificial intelligence (AI)-based intelligent adversary modeling tool that can more realistically and dynamically portray the behaviors of opposing forces for Course of Action (COA) analyses. Once completed, the tool, called MADCAP (Modeling Adversaries for COA Assessment via Predictive Simulation), will also have applications in commercial video game development, where increasingly advanced AI software is being used to define more life-like character behavior.

MADCAP is designed for use by non-programmers. MADCAP will enable subject matter experts - such as military analysts and intelligence personnel -- who are not software programmers to build models of how forces would react under specific battle scenarios, thus making the outcomes of battle planning simulations more realistic and useful to U.S. military commanders.

Similarly, game designers will be able to use MADCAP to imbue characters with clever behavior which is not simply scripted and predictable, but adapts as the situation changes. As a result, the game player's experience will be more engaging and challenging.

MADCAP enables simulation and game designers to develop goal-driven intelligent behaviors using a two-tiered approach. SimBionic behavior transition networks enable game designers to draw flowchart-like diagrams to specify decision-making logic for each game character. A hierarchical task network planner then enables game characters to achieve their goals by dynamically constructing plans from a library of plan fragments. These two reasoning methods are tightly integrated, so they can be combined easily to build game characters and simulated forces that think and act quickly yet strategically.

MADCAP has two core components: A visual editor to specify how the user wants opposing (red) forces to act, based on an array of behaviors and tactics at their disposal (rather than precise scripting of each step); and an engine that plugs into a simulation to control the red forces during a COA analysis.

"MADCAP is a highly dynamic, goal-driven adversary modeling tool," said Richard Stottler, president of Stottler Henke Associates. "Once the user establishes a list of goals for the adversary, the software will deliberate, assemble an action plan and modify it appropriately as circumstances change.

Stottler Henke expects to deliver an initial version of MADCAP integrated into a designated Air Force COA simulation in 2007. For original article visit: http://www.asd-network.com/press_detail/7938/Stottler_Henke_Receives_Contract_to_Create_More_Accurate_Battle_Simulations_.htm

FIRST ARMED GROUND ROBOT READY FOR DEPLOYMENT

The robot army is coming. A concept touted by science fiction novelists for decades, the first armed ground robots may roll into the field as early as this month, according to Army and industry officials.

Unlike the sci-fi robots that enslave mankind, these will not have autonomous control. Two years of safety testing will

ensure that the machines only fire when commanded to do so, officials said. "There's a huge revolution about to take place in the next two months when we put the very first armed robot on the ground into combat," said Charlie Dean, program manager for advanced robotics at Foster-Miller Inc., the system's contractor.

The special weapons observation reconnaissance detection system, SWORDS, is a combination of two commercial-off-the-shelf items, the Talon IIIB robot and a standard M249 machine gun.

Up to 83 will be deployed in Iraq pending Pentagon approval, according to Michael Zecca, SWORDS program officer.

The goal is to "find, fix and finish the enemy" while reducing the exposure of troops to live fire, and therefore, the potential for casualties, Zecca said.

The program was put on an accelerated testing schedule after the Army sent out an operational needs statement in 2004. The statement allowed the acquisition process to proceed on a quicker schedule. Zecca expects the two-year testing process to be cut substantially for future versions. "It was a learning process," he said at an Institute for Defense and Government Advancement conference.

The testing "has been a struggle," Zecca admitted. Safety was the number one concern. The goal was to ensure that the robot fired only when the user intended it to fire, he added.

SWORDS is mounted on the Talon IIIB robot, manufactured by Foster-Miller, which has sent dozens of the models to Southwest Asia, mostly for explosive ordnance disposal teams. They have also been used for reconnaissance in urban environments and caves in Afghanistan.

The first wave of SWORDS robots will carry the M249. The M240B medium machine gun will be mounted next, and approval to do so will likely come within months. The idea, Zecca said, is to take baby steps in the system's development.

The first robots to be fielded will carry 200 rounds. Future development plans call for increases in the amount and types of ammo, Zecca said. The robot will be able to operate about a mile beyond the operator, who will monitor the unit on a view screen.

The system was designed to be used by a single soldier. Dean said the goal was to allow the operator to see exactly what he would through a normal gun sight. "The machine gunner is already trained to use that optics, so he doesn't have to learn anything new," Dean said.

"He's seeing what he would see with his eyeball squished up against the gun, but now on a camera." The effect will be to "move the machine gunner's hands 500 to 1,000 meters away from the body," he added.

The system will have four cameras and night vision capabilities. It has been tested successfully in six inches of water, and has been used up to 2.1 miles away, although operators will likely keep that down to a mile.

Safety measures include a kill switch and encrypted commands. The kill switch was added late in the testing process when a robot had an "uncommanded movement," Zecca said. It was the first such incident with a Talon, but Foster-Miller came up with the device within three weeks to allay any concerns. The system also had to pass some last-minute tests at the Yuma proving ground's IED testing facility in Arizona to ensure its communications system did not interfere with other links and was immune to electronic fratricide.

A unique capability of SWORDS, Dean added, will be the option of firing single shots or bursts, something a soldier currently cannot do. A squeeze of the trigger would fire at least seven rounds. That effectively makes the robot a sniper or a machine gunner.

"It's quite revolutionary," Dean said, while claiming the system will be "more accurate than a soldier with his shoulder against the butt stock or a machine gun on a tripod." The robot will have to be in a set position to fire. Shooting and moving simultaneously

will be a feature added in future versions, Zecca said.

And there will be little protection for the robot itself, except for some Kevlar strips to ward off small arms fire. Its main defense will be its speed, low profile and the ability to maneuver behind objects, Dean said.

If a robot were to be captured, enemies would not be able to operate it without the control system. However, they might be able to strip off the gun and use it if they had ammunition, Zecca said.

Other features to be incorporated in future versions will be a round counter. Currently, the operator will have to use one of his cameras to visually check the magazine. Other firearms have already been mounted and demonstrated including grenade launchers and anti-tank rockets, Dean said.

"These robots are here now and they're going to be more prevalent in the future, so everyone needs to get on board and be able to support these systems," Zecca said. For original article from the National Defense Magazine visit:

<http://www.nationaldefensemagazine.org/issues/2006/June/FirstArmed.htm>

THE F-22 IS BATTLE READY

On Jan. 21, with little fanfare, two F-22s armed with live missiles took off from Langley AFB, Va., and streaked skyward. The Raptor sortie was undertaken as part of Operation Noble Eagle, the years-long Air Force campaign to defend US airspace. It was the first operational combat mission of America's newest and hottest fighter aircraft.

Good Enough To Beat You

Rather than clean up every single defect after every mission—"whether it be missing material, a crack, disbond, delamination, what have you"—the F-22's handlers aim to keep the aircraft stealthy within certain parameters. After every inspection, the surface defects are cataloged and fed into a computer program called the Signature Assessment System. From a "pristine"

aircraft fresh from the factory with no stealth defects—zero percent stealth impact—the percentage of dings on each Raptor accumulates over time in the computer model.

“When it broaches the 80 percent mark, we start to think about ... doing some repairs to get us back where we need to be,” Daig explained.

The model system is a far cry from the F-117 and B-2, which both originally required elaborate measuring devices—sometimes instrumented flying ranges—to measure their stealth. The B-2 has since moved to a system similar to SAS.

The “effects of defects” model “works very well for us, because you can find yourself with 200 to 300 nicks, dings, and scratches on the aircraft and still be an LO platform and still meet your LO missions,” Daig asserted. After the SAS registers 100 percent, “we can no longer guarantee to that pilot that he’s where he needs to be” in terms of stealth, she said.

Daig also said that some support equipment that can measure the F-22’s stealthiness is being tested, because “a lot of the pilots and senior leadership don’t necessarily feel comfortable with that model mentality.” However, she’s convinced, because numerous range tests have validated the SAS predictions. For complete article visit: <http://www.afa.org/magazine/april2006/0406raptor.asp>

THE MOST REALISTIC VIRTUAL REALITY ROOM IN THE WORLD

(AMES, Iowa) - More than \$4 million in equipment upgrades will shine 100 million pixels on Iowa State University’s six-sided virtual reality room.

That’s twice the number of pixels lighting up any virtual reality room in the world and 16 times the pixels now projected on Iowa State’s C6, a 10-foot by 10-foot virtual reality room that surrounds users with computer-generated 3-D images. That means the C6 will produce virtual reality at the world’s highest resolution.

Iowa State’s C6 opened in June 2000 as the country’s first six-sided virtual reality room designed to immerse users in images and sound. The graphics and projection technology that made such immersion possible hasn’t been updated since the C6 opened.

The difference between the equipment currently in the C6 and the updated technology to be installed this summer, “is like putting on your glasses in the morning,” said James Oliver, the director of Iowa State’s Virtual Reality Applications Center and a professor of mechanical engineering.

The new equipment - a Hewlett-Packard computer featuring 96 graphics processing units, 24 Sony digital projectors, an eight-channel audio system and ultrasonic motion tracking technology - will be installed by Fakespace Systems Inc. of Marshalltown, Iowa.

The project is supported by a U.S. Department of Defense appropriation through the Air Force Office of Scientific Research.

Oliver is leading a research team that’s developing a virtual reality control room for the military’s unmanned aerial vehicles. The researchers are building a virtual environment that allows operators to see the vehicles, the surrounding airspace, the terrain they’re flying over as well as information from instruments, cameras, radar and weapons systems. The system would allow a single operator to control many vehicles.

The C6 upgrade will move that project forward, Oliver said. For complete article visit:

<http://www.iastate.edu/~nscentral/news/2006/may/c6update.shtml>

MODELING AND SIMULATION HIGHLIGHT LEADERSHIP PROGRAM

(SUFFOLK, Va., May 1, 2006) - A group of local business and government leaders received a front row look today at how U.S. Joint Forces Command (USJFCOM) uses modeling and simulation (M&S) to accomplish its mission to prepare joint

warfighters for duties they may face around the globe.

The visit by the Civic Leadership Hampton Roads focused on the development and deployment of modeling and simulation (M&S) and its impact on the missions and initiatives of USJFCOM.

Civic Leadership Hampton Roads brings together leaders from across the area to connect with each other and address challenges facing southeastern Virginia.

USJFCOM's work in M&S has encouraged substantial growth in the area's industrial and educational sectors and brought the group to the command to learn more.

The program today provided these partners the opportunity to take a look at the latest in M&S through various discussions and simulations conducted by USJFCOM as well as the nearby Virginia Modeling and Simulation Center (VMASC) and the Lockheed-Martin Center for Innovation.

The two organizations are among several which USJFCOM partners with across the Hampton Roads area. These partners include numerous defense and non-defense businesses and industries, local academia, such as colleges and universities, and the state and local government.

According to Gene Newman, former USJFCOM Joint Warfighting Center (JWFC) technical director who currently assists the present JWFC technical director on special projects, the Civic Leadership Institute's visit represents "the first group that we have presented to that is not primarily military-related. Over the past ten years, we have talked about creating modeling and simulation beyond the Department of Defense. Our discussions here today help carry that forward".

Today's program exhibited M&S so that the Civic Leadership Institute can take notice of USJFCOM's efforts to develop and deploy its capabilities with the hope to create new partnerships. This event was an opportunity to "bring them out, let them see it, let them

touch it, and you can already hear them buzzing about it," said Lewis.

"I think this is a huge benefit because these are key decision makers for this community. They understand that there is something really exciting going on out here, and they can't really get it until they wrap their arms around it and that was what was so important about today."

IST HOSTS MULTINATIONAL NATO INFORMATION SYSTEM TECHNOLOGY PANEL MEETINGS

University of Central Florida (UCF) research in simulation, robot teams and human-machine interface received international exposure at a recent NATO technology conference hosted at IST (Institute for Simulation & Training).

Current research at IST, and in psychology and philosophy departments and several engineering disciplines, is highly relevant to this NATO group.

Recent NATO projects of interest to Orlando researchers include organizational modeling, evolutionary software development and multimedia display of huge quantities of data.

UCF Team Performance Laboratory director Dr. Florian Jentsch is a member of a NATO task group studying issues of human trust and confidence in automated systems including robots and IST deputy director Dr. Brian Goldiez is a member of a similar group investigating issues of complexity in large scale systems.

Host for the three days of sessions was IST director Dr. Randall Shumaker, who was for six years the U.S. national leader of the NATO Information Systems Technology panel (initials coincidentally the same as the UCF institute). He is currently a "member-at-large," appointed for his specific technical expertise and international recognition.

Forty-five members of the panel met in UCF's Partnership II building in Central Florida Research Park near the university. The panel is one of several composed of

senior-level technical experts appointed by the 26 NATO member nations. Each country appoints up to three panel members—most are from government agencies.

The panel is one of six high-level technical groups under NATO's Research and Technology Organization (RTO), a central element of NATO's defense science and technology program. Since 1949 this program has led international cooperation in promoting stability and security.

RTO conducts and promotes cooperative research and information exchange to support the development and effective use of national defense research and technology to meet NATO's military needs (1) to maintain a technological lead and (2) to provide advice to NATO decision makers. More in depth information about NATO technology initiatives is at www.rta.nato.int. For original article visit: <http://www.ist.ucf.edu/nlarchive/summer06/summer06.htm>

NEW VIRTUAL REALITY ARRAY ALLOWS IMMERSIVE EXPERIENCE WITHOUT THE DISORIENTING 3-D GOGGLES

(PHILADELPHIA) - The University of Pennsylvania has installed a virtual reality system that allows a participant full-body interaction with a virtual environment without the hassle of bulky, dizzying 3-D glasses.

Key to the installation, dubbed LiveActor, is the pairing of an optical motion capture system to monitor the body's movements with a stereo projection system to immerse users in a virtual environment. The combination lets users interact with characters embedded within virtual worlds.

"Traditional virtual reality experiences offer limited simulations and interactions through tracking of a few sensors mounted on the body," said Norman I. Badler, professor of computer and information science and director of Penn's Center for Human Modeling and Simulation. "LiveActor permits whole-body tracking and doesn't require

clunky 3-D goggles, resulting in a more realistic experience."

LiveActor users wear a special suit that positions 30 sensors on different parts of the body. As the system tracks the movement of these sensors while an actor moves around a stage roughly 10 feet by 20 feet in size, a virtual character - such as a dancing, computer-generated Ben Franklin, Penn's founder - can recreate the user's movements with great precision and without a noticeable time lag. The system can also project images onto the array of screens surrounding the LiveActor stage, allowing users to interact with a bevy of virtual environments.

LiveActor's creators envision an array of applications and plan to make the system available to companies and researchers. Undergraduates have already used LiveActor to create a startlingly realistic but completely imaginary 3-D chapel. The array could be used to generate footage of virtual characters in movies, sidestepping arduous frame-by-frame drawing. LiveActor could also help those with post-traumatic stress disorder face their fears in a comfortable, controlled environment.

"The system is much more than the sum of its parts," Badler said. "Motion capture has traditionally been used for animation, game development and human performance analysis, but with LiveActor users can delve deeper into virtual worlds. The system affords a richer set of interactions with both characters and objects in the virtual environment."

While stereo projection systems have in the past been limited to relatively static observation and navigation - such as architectural walk-throughs, games and medical visualizations - LiveActor can be used to simulate nearly any environment or circumstance, chart user reactions and train users to behave in new ways. Unlike actual humans, virtual characters can be scripted to behave consistently in a certain way.

LiveActor was made possible through a grant from the National Science Foundation with matching funding by Penn's School of

Engineering and Applied Science, as well as equipment grants from Ascension Technology Corporation and EON Reality. For more information visit: <http://www.psu.edu/>

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