IST hosts multinational NATO Technology panel meetings

UCF research in simulation, robot teams and human-machine interface received international exposure at a recent NATO technology conference hosted at IST.

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 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. Dr. Shumaker also is a faculty member of the university’s School of Electrical Engineering and Computer Science and Industrial Engineering and Management Systems department. 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 strategy.

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Project preserves images of Florida's space launch complexes

Since its first missile launch in July of 1950, Florida's Cape Canaveral has become synonymous with space travel. But, although the Cape has been a part of every dramatic chapter in the nation's history of space travel, time has not been kind to "on the ground" evidence of the U.S. space program.

It is for this reason project director Lori Walters founded the Florida Space Coast History Project to preserve the memory of Florida's unique space and missile heritage. The project is part of a larger UCF Virtual Heritage effort whose work to date will be on display at the university's main library from June 1 to July 31.

Now an IST faculty researcher, Walters is working with Eileen Smith, of IST's Media Convergence Laboratory, and Michelle Adams of the UCF Department of History to provide a comprehensive historical record of Florida's space industry, including an MCL-constructed 3D virtual replica of the Cape Canaveral of the 1950s and 1960s.

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IST honors students for research accomplishments

The institute recently honored four of its exemplary students—two undergraduate and two graduate—for their research accomplishments this past year. Most students at IST work in paid internships on real-world contract-supported projects. IST sponsors the awards annually to recognize research excellence.

Third-year computer science undergraduate student Brandon Haber helped develop an engine for an after action review project in progress at IST.

New improvements in the AAR software allow the review leader to move around more quickly in the timeline by eliminating the need to process large amounts of data between steps in the review timeline. Skipping ahead 20 minutes in an exercise now can take less than a second, compared to roughly a minute before the enhancement. Brandon is a research assistant in IST’s Interactive Realities Lab.

Heather Priest is a doctoral candidate in applied experimental and human factors psychology. Her research projects with IST’s Human Systems Integration Research group have contributed to our knowledge of team performance under stress, leadership intervention training, evaluation of learning techniques and net-centric warfare. She has been an integral part of the development and implementation of a number of empirical studies.

Sherri Ann Rehfeld has been IST’s Team Performance Laboratory lead researcher on human-robot interaction. Responsibilities have included recruitment, selection and supervision of all undergraduate research assistants. On her way to the Ph.D. she has successfully defended her dissertation on interaction of spatial abilities and mental transformation. Her data have become an integral part of research under the Army Research Lab’s multiple soldiers-multiple robots research program.

David Smith graduated in May with a bachelor’s degree in computer science. While working in the Interactive Realities Lab at IST he concentrated on haptic (touch) interface research. His contributions to the development of haptic event abstraction contributed to this award recognition.

One of the challenges Smith took on was to categorize the kinds of haptic "events" that could provide feedback to the user. "Haptics is a very broad concept," he says, "but haptics hardware tends to serve very specific purposes."

This results in haptics-enabled applications that rely on a specific hardware device for a certain kind of haptic feedback and are difficult to extend to include new technology. Smith’s work contributed to the development of a library of haptic events and a method for mapping them to hardware.

You can find out more about the research of these and other students and scientists at IST at the appropriate labs on the IST Website (www.ist.ucf.edu) or by contacting us via post, phone, or e-mail.

NATO panel holds Spring meetings at IST’s Partnership II offices

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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.

Haptics researcher Todd Lazarus demonstrates a device used on the haptics testbed to provide the sense of touch in a simulation.
Shadows of Canaveral is a 3D trip to 1962 continued from 1

Phase one of the project, Shadows of Canaveral, scheduled to open in late June at the UCF Library, will take observers back to those formative years of space flight. Shadows is an interactive 3D journey back in time to February 20, 1962, the day astronaut John Glenn piloted the Mercury-Atlas 6 "Friendship 7" spacecraft on the first U.S. manned orbital mission.

Phase two will take visitors further back in time to 1950 to witness the first launch from the Cape, Bumper 8, and will include pre-rocket history and a revisualization of the Cape Canaveral lighthouse complex.

State of Florida Bureau of Historic Preservation grants support both phases of the Space Coast History Project.

Go to www.capehistory.org for a sampling of the images being developed for this project.

UCF researchers say virtual reality may reduce conflicts among decision makers

You’ve witnessed the scenario dozens of times in films or on TV: a diverse group of officials in a crisis situation battle with events—and with each other. They usually bring a wide range of experience and expertise to the table and the result, predictably, is a dramatic conflict of ideas and solutions, with the wellbeing of life on Earth at stake.

It happens in real life, too, with consequences that don’t go away at the end of the hour.

But there’s a neurological reason for these conflicts, say members of a University of Central Florida research team.

Faced with risky decisions, researchers theorize, experts and amateurs often make conflicting choices because their brains process the same information differently.

The team has gained a $647,430 award from the National Science Foundation to find out how decision making teams can be trained to work together better.

Led by economics professors Glenn Harrison and Elisabet Rutström, psychologists Stephen Fiore, Shawn Burke and Eduardo Salas, computer scientists Charles Hughes and Sumanta Pattanaik, biologist John Weishampel, media artist Christopher Stapleton and others, researchers will conduct experiments using virtual reality simulation at IST.

Also participating in this research is Paul Feltovich, a scientist from the Institute for Human and Machine Cognition in Pensacola Florida, and Neil Charness, a psychology professor from Florida State University.

According to researchers, the study will lead to a better understanding of how people make decisions in complex and uncertain environments

An ability to explain the sources of differences in the decisions reached by experts and non-experts could affect policy making processes, jury selections, expert witness testimonies and other areas where both experts and non-experts participate in decisions.

The complex and uncertain environment chosen for this research is the need to arrive at a decision about using controlled burning to prevent wild fires from destroying a forest. People who make recommendations and arrive at decisions about such operations currently review documents where scenarios are described in words and pictures. Conclusions by experts such as forest management personnel and non-experts (such as homeowners from nearby neighborhoods) using this document review method can vary widely.

Researchers hypothesize that these differences in values and decisions will be smaller when a scenario is presented as an interactive virtual reality simulation.

The virtual reality environment for non-experts, say researchers, can substitute for the mental simulations or short-cuts that experts seem to be better able to perform due to their greater familiarity with a subject. Findings from this research may show how similar technologies can be developed to support decision making and problem solving in other complex and uncertain environments.
Amidst a tangle of network connections, the Virtual Technologies and Environments (VT&E) team kicked off its Deployable Virtual Training System with a demo to potential industry bidders for an upcoming major defense contract. Led by IST senior researcher Denise Nicholson (inset), the team also includes Lockheed Martin, Alion-BMH and a number of other contractors in both government and academia. Demonstrated was a prototype training system for U.S. Marines heading into combat. The system is designed to be deployable for training wherever the troops are stationed.

Media Convergence Lab goal: supercharged experiences to go

Suppose you could transform the drab walls of a room into a virtual landscape that placed you right in the middle of a training scenario. At once your reality is altered from semi-detached participant on the safe side of a computer screen to fully engaged player, immersed in the action. Now you are not just a spectator. You are surrounded by and a part of the action.

World-class theme parks for years have played this concept to millions of visitors, transforming two-dimensional cinema entertainment into immersive—and sometimes interactive—ride-through adventures. Innovators in the Media Conversion Laboratory at IST are pushing...
Portable environments could extend computer images beyond screen boundaries

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technology one step further in their quest to merge entertainment with learning.

Much of MCL’s research focuses on intensifying engagement to supercharge experience. The lab and other investigators at IST have built a growing body of research that confirms the value of engagement in “creating lasting memories”—a key to learning retention, according to MCL research associate Eileen Smith. The greater your engagement—the more you’re into—an activity, the more likely the experience will produce lasting memories.

MCL’s goal is to heighten engagement by eliminating the boundaries of the computer screen. The lab’s challenge: to create portable environments that train, educate and entertain by simulating actual experience.

The lab’s term for the products of this challenge, “Human Experience Modeler,” covers a variety of prototype systems that mix computer graphics with real-time images. These “mixed reality” systems use head-mounted displays that provide video camera vision of the real world blended with computer-generated graphics. Position tracking of the head-mounted display and precise mapping of real-world objects are critical if accurate mixing of real and computer images is required.

MCL has demonstrated prototypes for mixed reality urban combat training, fantasy games, movie trailers, museum exhibits and medical rehabilitation. Current efforts are to use the technology to create more portable environments, convenient to transport to and set up, whether for on-the-spot training, marketing or entertainment.”

The lab’s “MS ISLE” testbed (mixed simulation for interactive sea & land environments) uses retro-reflecting curtains as walls of an “immersion booth.” Micro-reflectors in the curtains bounce color keyed light directly back to the head-mounted cameras (on the player at right). The players see computer-generated images substituted for the keyed light. Sound and wind effects add intensity to the experience.

Face study shows simple shapes, sizes and colors can influence ‘personality’ perception

Which of these faces seems more aggressive, animate, friendly, intelligent or trustworthy?

A recent joint study conducted by UCF psychologists and robotics researchers showed that size does make a difference in what attributes we assign to abstract “faces.” So does shape, color, relative size texture and feature placement.

The faces shown here are only a small sample of the many variations used in the study. Among the categories were eye size, pupil size and shape, eye color and feature shape.

In the eye size category, for example

(center boxes), people rated large round eyes as more aggressive than small or square eyes.

Research was sponsored by the Army Research Development and Engineering Command. The UCF Collaboration for Advanced Research on Agents & Teams directed by IST and the Applied Cognition and Technology program coordinated by psychology associate professor Valerie Sims.