

Review

**INSTITUTE for
SIMULATION
& TRAINING**

Goldiez takes helm as Interim Director

Brian Goldiez has been appointed IST's Interim Director while a university search committee conducts a nationwide search for a new director. The committee began reviewing candidates in mid-April with the intention of filling the position by fall.

Mr. Goldiez expects to continue IST's leading role in simulation research, training and service by expanding and reinforcing the institute's relationships with

faculty and external agencies and widening its base of sponsored research. He intends to move IST quickly and boldly forward to keep UCF in a preeminent position in the industry.

For the past five years, Mr. Goldiez served as IST's deputy director, managing many of the institute's technical programs. He has been with the university for nearly 11 years and for 25 years has worked in all aspects of the industry. He

holds a BS in aerospace engineering from the University of Kansas and an MS in computer engineering from UCF.

Under Mr. Goldiez' direction IST will strengthen its role as a gateway and integrator, facilitating development in the modeling, simulation and training field. He will ensure that IST remains responsive to any question or issue in modeling, simulation and training.



Dr. Guy Schiavone, a visual systems scientist at IST, checks the position of a laser range finding device set up to scan a road corridor. The institute is looking at alternative ways to efficiently collect and store accurate terrain data.

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IST evaluates PC games' potential for real training

Can a \$50 flight simulator game and a specially configured desktop computer help Navy flight school students become better pilots? The Navy wants to know and they have tasked IST to help them find out.

The Chief of Naval Education and Training initiated the MicroFlight project to rapidly identify and apply commercial PC gaming and simulation technology to the development of pilot warfare skills and tactical thinking.

The PC gaming and simulation industry, largely driven by recent technology advances and consumer economics, has dramatically driven costs down. At the same time they have improved the quality and realism of games and desktop simulation technology. The cost to capability ratio available today was unheard of just two years ago.

This technology, the Navy reasoned, could be an affordable way to get warriors to practice flight and tactical thinking. It's already being applied in civilian and military training organizations. PC gaming and simulation is also widely accepted and very familiar to today's students, who have grown up with computer games.

To aid the Navy in its research IST researcher Norm Helberg has assembled and reconfigured an assortment of off-the-shelf simulator products that Navy pilots-in-training may use to augment their formal flight school instruction. Helberg is studying a range of components, from a basic "economy" desktop Pentium®-pow-



Norm Helberg guides visiting Brigadier General(select) Mark Welsh, Commander of the Center for Aerospace Doctrine & Education on a flight. In back: Ron Tarr, Program Manager.

ered computer to a full cockpit mockup with functioning gauges and controls.

Trainees would use the simulator during off-duty hours to practice flight procedures. Simulators can even be linked together, through local connections or over the Internet, so students can practice interacting with others "in the air."

"The simulator is not a substitute for flight training," says Helberg, himself a former Navy pilot. "It's intended to be an adjunct to it."

Helberg says the Navy is very much interested in these cost-effective ways to increase the level of training of its pilots. Assembling the components is just one step in the process. The bottom line is "Does it work?"

"We're taking what are basically some very good video games, adding low-cost components that help replicate the flight experience and analyzing their effect on real training," he says. "The outcome of the Navy's analysis could have a significant impact on the near-term direction of low-cost and commercial off-the-shelf simulation products." 

Moving simulation into operational platforms

Reeling from the shock of an anti-tank barrage that was too close for comfort, the four soldiers hunker down in the bowels of their M1A2. Console indicators angrily flash a degraded turret control as the driver, beads of sweat forming on his brow, frantically pulls at the controls in a compensating maneuver to avoid more incoming artillery. The tank commander simultaneously feeds counterstrike data into his console.

A radio call cuts through the din with a terse order and in unison the crew immediately slouch back in their positions. The tank commander pops the turret hatch and one by one they scramble out onto the tank's superstructure, dropping lightly to the sun-baked clay of the motor pool. Crews from other tanks lined up nearby spill out of their vehicles and head for the morning debrief.

On this particular day, the crews are using these battle-ready tanks for training. With capabilities equal to a state-of-the-art training simulator built in, commanders and crews can plan and rehearse missions or conduct reconnaissance of distant areas without leaving the motor pool. The Army is exploring the technology needed to bring this concept to reality service-wide and IST is an integral player in this research.

INVEST (Inter-Vehicle Embedded Simulation Technology) is a five-year (1996-2001) Army research program to demonstrate technologies that will support embedding an advanced distributed simulation system in combat vehicles. Mr. Hubert Bahr of STRICOM's Engineering Directorate manages the program.

IST is one of a consortium of commercial and government agencies contributing to this research effort. The Integrated Product Team (IPT) includes LMIS, SAIC, OASIS, SRI International,

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Performance Technology Group sponsors workshops

Feature

IST's Performance Technology Group combines the efforts, insights and experience of educators, curriculum developers, psychologists, modeling and simulation researchers and engineers. The group develops performance-improving teaching aids and curricula to help an organization become more productive and more successful.

The group regularly offers seminars and workshops, from basic to advanced levels. Offerings are based on the latest research in modeling and simulation, instruction (both education and training) and information technologies, including distributed learning issues.

In addition to its regularly scheduled offerings, PTG develops courses custom tailored to an organization's needs. The group also will design tools to help course developers evaluate the effectiveness of various instructional media and innovative technology.

Here is a schedule of upcoming offerings at IST's headquarters in Orlando. For more details and course outlines, call (407-658-5080), write (PTG, Institute for Simulation & Training, 32080 Progress Dr., Orlando, FL 32826) or e-mail (rtarr@ist.ucf.edu) the Performance Technology Group.

- **Web-Based Instruction**
May 10 - May 14, 1999

This hands-on workshop shows attendees how to convert paper-based or instructor-led courseware to Internet/Intranet instruction. Using real-world examples, up-to-date research and extensive hands-on practical exercises, the workshop will provide students the knowledge and skills to select, evaluate and optimize various media for a Web environment.

For: Mid-level staff who participate in or manage instructional technology application, design courses, convert materials for distance learning or develop just-in-time training.

Fee: \$750/attendee

- **Modeling and Simulation: A Users' Survival Course**
June 7 - June 11, 1999

This hands-on workshop provides the foundations essential for mastering the world of Modeling and Simulation. Attendees are exposed to not only the fundamentals but also the challenges facing test and evaluation; validation, verification, and accreditation; synthetic environment representation; security and many other aspects of cost-effective use of distributed simulation.

For: Military, government and industrial management and technical personnel at various levels involved in the design, development, operation or modifi-

cation of M&S applications, training, analysis, test and evaluation, R&D and operations.

Fee: \$795/attendee

- **Advanced Learning Technology Workshop**
June 21 - June 25, 1999

This workshop will introduce attendees to the current systems approach to training concepts. The emphasis is on identifying and designing how to meet training and education requirements with the latest technological tools. Facilitators use real-world examples, current literature, technological demonstrations and group interaction to illustrate the instructional development process. Attendees will be exposed to needs assessment; learning outcome analysis; appropriate media, instructional techniques and technologies selection; criterion test design and results evaluation.

For: Mid-level staff within military and industrial communities who have limited or no previous knowledge of the systems-design approach to instruction. These individuals participate in or manage instructional technology applications, design courses, convert materials for distance learning or develop just-in-time training.

Fee: \$750/attendee



Endoscopic Surgery Simulation

A joint project with the Orlando Regional Healthcare System, Health Research Institute, may lead to a new way to train surgeons in endoscopic surgery techniques.

Endoscopic surgery allows doctors to operate on patients by the insertion through a small incision in the body of slender tubes that contain fiber optic lights, miniature instruments and a camera. The surgeon guides the instrument

inside the patient by observing the actions on a television monitor.

Endoscopic techniques were known as early as the 1940s but did not become popular until the late '80s. The types of surgeries that can be accomplished in this manner are rapidly growing in number.

The technique requires the surgeon to learn a new set of skills. The indirect nature of the interaction requires different eye-hand coordination. Surgeons also

must become used to the constrained view of the camera and the lack of tactile interaction. The techniques also pose a new and very different set of possible complications.

Current endoscopic training techniques are less than adequate for the new skills surgeons must master. Today's training consists of observing and performing operations on animals (usually pigs). Not

See "Surgery" on page 4

Short Takes

Dr. Peter Kincaid, a principal scientist at IST, is author of the Instructor Guide, *Research and Analysis Methods in Emergency Management*, just published by the Federal Emergency Management Agency (FEMA) and intended for nationwide use.

The guide is a resource for instructors planning college-level emergency management courses and also serves as a text for the course. FEMA's Emergency Management Institute has proposed approximately 20 courses for development as a core curriculum for enhancing the professional qualifications of emergency managers.

The program at UCF falls under the College of Health and Public Affairs, Department of Public Administration. Dr. Kincaid is also a professor of psychology and a member of the university's human factors psychology faculty.



"INVEST", from pg. 2

ARI, TARDEC, UCF, and ATSC. Research topics include technologies to:

- * Reduce communications demand between simulation entities
- * Realistically inject virtual targets into live scenes
- * Use geometric (vice laser) input to pair shooters and targets
- * Provide virtual targets that can be engaged with live ammunition
- * Adapt real vehicle hardware and software to work with simulation

IST's role in this program includes technology and integration planning, architecture development, feasibility assessments and independent analysis. IST is conducting applied research into current and future low cost graphics hardware capabilities and terrain database requirements for INVEST demonstrations. Gary Green is point of contact.



"Surgery", from pg. 3

only is this practice ethically questionable, but the cost limits the number of times each surgeon can practice. It is common for a surgeon to observe or perform only two operations before assisting with actual patients.

IST research is aimed at determining the practicability of using the tremendous visualization power of computer workstations as a substitute for endoscopic training on live animals.

Researchers have investigated key requirements for simulating endoscopic surgery. Included in their objectives are identification of needed skills, development of a realistic, texture-mapped CAD model of the human body, design of an operating theater to provide visual realism and design of a method for objective grading of a surgeon's performance.

Principal investigators hope to apply their findings to the development of a prototype simulator that can be demonstrated to health care professionals and equipment manufacturers. Kimberly Abel Parsons is point of contact for this research.



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