



Researchers hope to enhance learning performance with Synthetic Learning Environments

Many theories of learning center on the notion that people use experience as a basis for gaining expertise. Although, neurologically speaking, you may not know how this works, you probably would agree that it is easier to learn when the subject is familiar and much more difficult when concepts and terminology are new to you.

Several years ago, IST research showed that Navy flight students learned flight procedures better after practicing with a popular flight simulator game. Although

continued on page 3

IST, Army Research Institute sign cooperative agreement for augmented reality study

IST and the Army Research Institute for the Behavioral and Social Sciences have entered into a Cooperative Research and Development Agreement to collaborate on augmented reality research.

continued on page 2

AT&T Foundation gives \$25K grant for M&S graduate study



Florida congressman Tom Feeney (FL-24) (right) joined AT&T representatives Bob MCCarty, VP, Sales Center, and Edward Babiuch, District Manager AT&T Government Solutions Orlando Operations, and M&S graduate program chair Peter Kincaid in a check presentation ceremony at IST's Orlando headquarters.

AT&T representatives recently presented a \$25,000 grant earmarked for fellowships in the Modeling and Simulation graduate program. IST accepted the grant on behalf of the UCF Foundation.

IST senior research scientist and M&S graduate program chair, Dr. Peter Kincaid, said the funds will be used to augment financial aid from the university with the goal of attracting the best possible graduate study candidates from across the country.

"We're delighted to make this donation to UCF's outstanding modeling and simulation graduate program," said Lou Addeo, president of AT&T Government Solutions.

"We hope this grant will attract the best and the brightest in the field to Orlando to study and contribute to high-tech job growth in the area. We have a vibrant M&S business right here in Orlando and we're proud to help make this area a leader in this important and growing field."

Modeling and simulation has grown in recognition by industry as a field worthy of advanced study," said IST Director Randall Shumaker.

continued on page 2

AT&T joins IST Affiliates with \$25K grant for fellowships (continued)

"This grant by AT&T is a prime example of that recognition and will help attract highly-qualified students to the program."

Attending the announcement ceremony, Florida Congressman Tom Feeney (FL-24) said that the university's cutting edge programs have helped place the Central Florida High Tech Corridor at the forefront of technological research and development.

"AT&T's grant will further solidify the region's lead and increase the attractiveness of the Institute for Simulation and Training," said Feeney.

According to UCF records, 94 students—more than 50 percent



Florida Congressman Tom Feeney (left) and AT&T vice president for Florida legislative affairs, Gary Andraza (right) after the presentation toured some of IST's work-in-progress.

According to a recent economic study, modeling, simulation and training in Florida contributes \$9.4 billion to the state's gross regional product, generating \$5.4 billion in sales. The cluster of simulation and training related industry may be the largest of its kind in the U.S. ○

IST Affiliates

...individuals, corporations and organizations that through membership have established a close association with IST gaining exposure to cutting edge technology, early access to the next generation of modeling and simulation experts and interaction with IST and joint IST-UCF faculty leaders in M&S science.

For information on how to become an IST Affiliate contact IST's director,

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UCF's M&S graduate program...

- Master's, PhD
- Multidisciplinary...
 - 3 Computer science
 - 3 Engineering
 - 3 Digital media
 - 3 Psychology
 - 3 Mathematics
 - 3 Business
- Graduate support
- Websites...
 - www.graduate.ucf.edu
 - www.ist.ucf.edu/phd

above projections—are currently enrolled in one or more of the 93 available courses leading to a master's or PhD in modeling and simulation. So far, the university has awarded seven master's degrees in the new program. Two

doctoral dissertations, both in the field of augmented reality, are in progress.

Inaugurated in 2002, the multidisciplinary program accepts students from arts and sciences, engineering, computer science, psychology, mathematics, statistics and digital media.

IST, ARI sign co-op agreement (continued)

A Battlefield Augmented Reality System developed by the Naval Research Laboratories will be on loan to IST from the Army. IST over the next few years will conduct effectiveness studies using this system.

Augmented reality systems use optics, computer generated data and other devices either portable or worn on the body to enhance

the information the user has about a subject.

In a battlefield environment augmented reality could provide enemy strength, position and characteristics, terrain data or any other information useful to the soldier. ○

Synthetic Learning Environments aid learner's experience (continued)

the game could not teach them to actually fly a plane, it familiarized them with the cockpit environment and the steps necessary to perform a successful training flight.

The computer game provided a synthetic learning environment that in many ways was a stand-in for the real thing. The game also provided entertainment value and researchers are establishing a correlation between entertainment and learning retention.

Simulations, another term for these synthetic environments, have become quite sophisticated and, thanks to the widespread use of powerful yet affordable computers, have grown as a learning tool. Lagging behind this growth is clear knowledge of how well they promote learning or what designs promote learning most efficiently.

synthetic experience is created deliberately and artificially in learners to replace, augment, accelerate or broaden actual experience in the world.

A team of IST/UCF faculty researchers and students and such industry partners as General Dynamics/Veridian Corp., JHT, Inc., I.D.E.A.S. @ Disney, Orange County (Florida) Public Schools and the Florida Virtual School,



Project leader Haydee Cuevas (center) confers with members of the Virtual Field Trip project, student researchers Linda Uphan-Ellis (left), Andrew Schrock and Courtney Schwartz, in the IST synthetic learning environments lab. The goal of the project is to improve reading comprehension using interactive "field trips" that acquaint beginning readers with unfamiliar concepts, characters and environments.

has undertaken the task of gaining a more thorough understanding of the nature of computer-created synthetic experience. Funding is from the National Science Foundation.

Principal Investigators, Jan Cannon-Bowers (Digital Media), Steve Fiore (Psychology) and Bobbie Jeanpierre (Education) have combined efforts to create and manage a Science of Learning Center to investigate synthetic environments and the experiences they generate.

One such environment study is already well underway, led by doctoral student Haydee Cuevas. Ms Cuevas and her team of student researchers developed a "virtual field trip" to acquaint disadvantaged beginning readers with unfamiliar people, places

and things contained in their reading books.

The synthetic environment contains elements from diverse fields, including cognitive science and educational psychology, simulation, digital media, cinematic storytelling, interactive entertainment and gaming. o



Haydee Cuevas recently received UCF's prestigious Pegasus Award, in part for her work on the Virtual Field Trip project.

Groundbreaking work at IST could provide components of future robot armies

Dramatic opening scenes in the "Terminator" movies depict stark killing fields populated by robotic machines programmed to locate and destroy a cowering enemy. In "Star Wars: the Empire Strikes Back" seemingly independent "probe droids" or "probots" patrol vast stretches of unmapped wasteland, relaying intelligence to a remote headquarters. In another "Star Wars" episode, legions of "battle droids" march as one into the heat of battle.

These surely are scenes from science fiction and fantasy, but are they really that far from becoming reality? In fact, the U.S. military already has deployed robot aircraft and ground vehicles in Afghanistan and Iraq...baby steps, to be sure, compared to



network of mobile and stationary intelligence gathering devices.

Issues arising from this effort are many, beginning with the very basic problem of providing lasting power to a vehicle platform laden with transmitter, receiver, geolocation equipment, camera, range finder, gyros and a cargo

of remote sensors to be dropped off along the way.

Communication, within the sensor network and from network to base, is another tall hurdle facing developers. An ultra wide band sensor web system currently under evaluation at IST shows some promise. The institute is exploring fundamental concepts for using ultra wide band radios to form a time-synchronized network to track multiple targets in any environment.

Behind all this movement and data collection in the field are personnel who will be required to control numerous robot devices. Picture an air traffic controller who must keep track and direct the movement of a sky filled with pilotless aircraft. IST's human factors scientists are tackling the human-machine interface part of the equation. o



technology of long ago in a galaxy far away, but vanguards, nevertheless, of a new chapter in war fighting history.

IST entered the robotic systems research field several years ago, a logical extension of its decade of work on computer generated autonomous forces. Current research centers on development of a new generation of autonomous wireless robot vehicles that can insert remote sensor agents into unknown territory, creating a distributed

Contact US

We'll be happy to provide more information about these and other research efforts at IST. Visit the IST website for overall information about the institute, e-mail the various program managers listed below or call us.

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