UPDATE NPS
Naval Postgraduate School Monterey, California

February 2010

NPS Showcases Latest in High-Tech Digital Cinema at CineGrid

By Joan Ackerman

A demonstration of "Project 8K" – the world's first dual synchronized 4K streaming video – was a highlight of the fourth annual CineGrid International Workshop held at the California Institute for Telecommunications and Information Technology (Calit2) in December, and experts at NPS helped make it happen.

Using two of the only three JVC prototype 4K cameras in the world, two 3840 x 2160 pixel images were streamed live during a 45-minute remote observation from the Monterey Bay Aquarium (MBA) via NPS to Calit2 at the University of California San Diego, and from there to Nippon Telegraph and Telephone (NTT) Network Innovations Laboratory in Yokosuka, Japan.

"Every year, we set out to impress Hollywood with what we're doing in the research community," says Calit2 research scientist and a founding member of CineGrid, Tom DeFanti. CineGrid is a non-profit international consortium that seeks to build an interdisciplinary community focused on the research, development and demonstration of networked collaborative tools, enabling the production, use and exchange of very high-quality digital media over high-speed photonic networks. "This year, we showcased our fully-evolved capabilities in distance collaboration for 4K editing and sound."

Laurin Herr, President of CineGrid, was instrumental in arranging the experiment and providing the technical guidance. Jeff Weekley, Research Associate at the MOVES Institute, supervised the special demonstration. To produce the streamed images, NTT lent their JVC cameras, Mark I and Mark II, high-quality video recorders and a variety of Nikon F-mount style lenses to NPS to stream and record the underwater habitat. With the support of Fred Cohn of the City of Monterey, Doug Weismann of ITACS and the NPS "Project 8K" team prepared and tested the network which required upgrades at the Aquarium and an accelerated timetable for planned upgrades to the city's network infrastructure. Alignment of the dual 4K images was rehearsed in the Dark Mirror Lab in Halligan Hall, so that the field recordings and the live streams could be aligned in real-time.

Jeff Malnick of the MOVES Institute sets up one of only three 4K protoype cameras in existence at the Monterey Bay Aquarium. NPS ITACS staff and MOVES researchers provided the technical expertise for a first-ever, synchronized dual 4K ultra high-definition video stream.

Field experiments included images of Asilomar Beach at sunset, and marine life at Moss Landing, where focus and aperture challenges were resolved. Additionally, a large contingent of the NPS Cycling Club rode out to Asilomar on the first day of field tests to provide drama and fast action. At CineGrid, the 8K images streamed from the MBA involved synchronizing two JPEG2000-compressed images from the Crevice Dwellers exhibit over the network at 400-450 megabits per second per stream viewed simultaneously in San Diego and Japan. The scientific and interpretive narration was delivered by James Covel, head of Interpretative Programs at the MBA.

The CineGrid event demonstrated not only the use of cutting-edge technology but also "the depth in networking at NPS, factors which can be used to strengthen partnerships with peers and to forge new partnerships around the globe," said Weekley.

4K video is both spatially and temporally higher quality than high definition (HD) video. In fact, dual 4K streams have 18 times as many pixels as HD. At 60 frames per second, images are projected at 2.5 times the rate of film or IMAX movies.

NTT will loan the JVC cameras and equipment to NPS again, so that this aspect of scientific inquiry can be further documented. A demonstration will also be presented to the CENIC participants who will be visiting NPS on March 8, 2010.

Many partners and collaborators have expressed interest in the technology: NASA's United Space Alliance, Naval Undersea Warfare Center, NPS Center for Autonomous Vehicle Research, JIEDDO, and others. With this technology, according to Dr. Donald Brutzman of MOVES, "NPS is institutionally positioned for maximum impact in remote sensing, telepresence, image analysis and cutting-edge optical network applications."

"Inside NPS" to Debut on the Pentagon Channel

By Dale Kuska

The story of NPS is about to be shared to more than 18 million viewers across the country and internationally when *"Inside NPS"* debuts on the Pentagon Channel on Friday, March 5. The television program will be a monthly 30-minute broadcast that features a wide range of university news, from research projects and student efforts to distinguished visitors and faculty honors.

"This television broadcast presents a wonderful opportunity for our university to share the NPS story with a wide audience. I previewed this inaugural broadcast and found it quite impressive," said NPS President Dan Oliver. "I sometimes hear NPS called one of our nation's 'best kept secrets' by those who become familiar with us. This program should help remove that dubious distinction."

"Inside NPS" is being spearheaded by Alan Richmond, NPS Director of Media, Marketing and Community Relations. In his current position, Richmond serves as the campus' primary contact for all external news media coverage, but now brings an entirely new level of exposure to the university.

"For the past year I've been working closely with leadership and producers at the Pentagon Channel in Washington in an attempt to secure a regular monthly half-hour time slot for a new NPS feature to be aired as a part of their regular programming schedule," Richmond said, who will serve as both producer and host of the program with Videographer Keith Wells behind the camera. "We're very pleased to see this effort finally come to fruition.

"This is a rare opportunity to reach a multitude of audiences around the globe," Richmond said. "The show will be placed in a specific time-slot monthly, but will also be repeated multiple times throughout the month in additional time periods. It will also be broadcast on Public Television Stations across the country, multiplying coverage to a civilian audience by unimaginable numbers."

Richmond says he encourages faculty, students and staff across campus to contact him with suggestions for content. "This program gives us access to tell our story in a quality television medium that we've not been able to utilize previously. We'll be gathering content for the show and scheduling filming and interviews on a continuing basis," he said. "And we have the ability to react quickly and in a timely fashion with regard to current events or breaking news NPS may be involved with, such as the Hastily Formed Networks team's deployment to Haiti." Richmond can be contacted at 831-656-3649 or abrichmo@nps.edu.

The program can be viewed locally on Comcast cable channel 28, will air on Access Monterey Television approximately six times per month, and will be streamed at www.pentagonchannel.mil.

The Pentagon Channel's programming includes in-depth coverage of senior defense officials and news of U.S. military activities around the world. Original documentaries provide coverage of real-world operations, missions and events highlighting the accomplishments of military men and women across the services. The Pentagon Channel is distributed via satellite to over 350 DoD facilities as well as to U.S. satellite and cable providers, and broadcasts to over 177 countries around the world.

NPS President Dan Oliver and Director of Media, Marketing and Community Relations Alan Richmond prepare for an interview for "Inside NPS," a half-hour monthly television program set to debut on the Pentagon Channel on March 5.

IN BRIEF

- MOVES Institute personnel attended the I/ITSEC conference, the largest Modeling & Simulation conference in military domain in the world. The Behavioral Analysis and Synthesis for Intelligent Training (BASE-IT) team was hosted at the Marine Corps' Program Manager for Training Systems booth where MOVES staff showed the results of their research efforts on the BASE-IT project, also briefed to military leaders and congressional visitors. Learn more about BASE-IT at http://www.movesinstitute.org/base-it/.

- ITACS is offering training classes in the Microsoft Office 2007 suite of products. Specific sessions in Outlook, Word, PowerPoint and Excel will be held during February and March. All classes are scheduled in GL-318 from 8:30-11:30 a.m. To review the list of classes and to register, go to http://intranet.nps.edu/Announcements/Postings/itacs_MS_Office_classesWinter2010.htm.

- In the two years since the Global Center for Security Cooperation (GCSC) has opened, its consortium membership has more than doubled. The rapid growth has enhanced the Global Center's ability to coordinate, integrate and de-conflict capabilities for its members and to provide a more comprehensive picture of ongoing events for the Office of the Secretary of Defense, the Defense Security Cooperation Agency and other customers. At GCSC's Director's Conference, educational institutions openly discussed shared issues and resolutions, and built strong relationships and networks of support to improve members' ability to operate. For updates on GCSC, go to http://www.nps.edu/Academics/Centers/GCSC/.

- The NPS Judo Club meets at the NPS Fitness Center on Monday and Wednesday each week from 6:30-8:30 p.m. No prior experience with Judo is necessary. For more information about the club, check out http://intranet.nps.edu/Clubs/JudoClub.html.

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Message From

Dean of GSOIS Dr. Peter Purdue

In support of the NPS mission, the Graduate School of Operational and Information Sciences (GSOIS) strives to prepare future military leaders to succeed in an uncertain and rapidly changing information intensive environment. Here are some examples of what we are doing today.

Vice Adm. David "Jack" Dorsett, the Deputy Chief of Naval Operations for Information Dominance (N2/N6) and leader of the newly created Information Dominance Corps (IDC) noted that the CNO has directed the Navy to be prominent in the fields of Intelligence, Cyber Warfare, Command and Control, and Information & Knowledge Management (KM). This is very good news for GSOIS since our departments are heavily involved in all of these areas.

We are also cooperating with GSEAS to establish educational and research programs that support the IDC, and give us an asymmetric advantage in cyber defense and warfare. Additionally, the Center for Edge Power is sponsored primarily by the Office of the Assistant Secretary of Defense for Networks and Information Integration to foster, coordinate and promote multidisciplinary research on all elements of network-centric operations. KM represents another active focus of research and education in GSOIS, and includes a master's degree curriculum track and certificate program on Knowledge Superiority. The Operations Research (OR) department's work on critical infrastructure systems strives to improve resilience under attacks from intelligent terrorists.

GSOIS prides itself in its direct support to the warfighter. Defense Analysis department examples include faculty trips to Iraq to support the development of their counter-terrorism force, reach back support for Combined Joint Special Operations Task Force-Afghanistan information operations, the completion of a Special Operations Forces counter-insurgency study that informed DoD's Guidance for the Development of the Force process, and recent sponsored research on a wide range of operational-related issue areas, including the insurgency in Iraq, manhunting, unconventional warfare, information operations and military transformation.

A group of computer science faculty and students are spearheading a multidisciplinary and potentially multi-million dollar research program that aims to transform the data communications of our frontline troops by leveraging commercial-off-the-shelf cellular technologies. The OR department continues to provide analytic reach-back to our forces in Iraq and Afghanistan.

The Distributed Information Systems Experimentation (DISE) research group within the Information Sciences department focuses on collaborating with operational commanders to develop objectives for complex field experimentation. DISE develops understanding of complex systems, methodologies and tools with the goals of optimizing decision-making effectiveness and creating theory from joint field experiments such as Trident Warrior and Empire Challenge (EC). DISE uses a consistent framework for analysis developed over the last 11 years to collaborate with all stakeholders in planning. Future efforts include providing network analysis for EC 10, combining multiple technologies – both real and synthetic – to demonstrate the usefulness of these technologies (e.g. Joint Multi-Mission Electro-optic System (JMMES).

On the teaching technology front, the OR department teamed with ITACS on the Technology Enhanced Active Learning (TEAL) classroom project outlined below. TEAL is a new type of classroom design to promote active learning through small group student collaboration using integrated IT assets that provide multiple presentation options, not just lecture-style presentations.

I invite you to contact GSOIS' departments directly for further information on these projects.

Announcements

Prof. Clark Robertson was appointed Chair, Department of Electrical and Computer Engineering, effective January 4, 2010. He will replace **Prof. Jeffrey Knorr** who, after serving as Chair for 8 1/2 years, is now leading the standup of the ECE Department's new Center for Cyber Warfare.

New Tenure-Track Hires

Lisa Lindsey, Associate Professor, Graduate School of Business and Public Policy.

Ops Research Unveils Future Classroom Design

By Joan Ackerman

Thanks to leadership and faculty in the Operations Research department, room 128 in Glasgow Hall has been transformed into a Technology Enhanced Active Learning (TEAL) classroom, an environment that facilitates active collaborative learning in a studio-like setting where students are situated in groups, each with its own dedicated audio-visual system, whiteboard and workspace.

The TEAL classroom houses specially built circular tables with laptop and wireless capabilities for teams of 3-9 students, two projectors and four flat-screens; each group/pod has its own display and whiteboard.

OR Chair Rob Dell and Associate Professor Ron Fricker learned about TEAL's pioneering design and visited the Web site (http://scaleup.ncsu.edu/) outlining the MIT-inspired design and research results using the TEAL concept. They identified the space and used FY09 funds from the nine-month model and additional research support to partner with ITACS to make the TEAL classroom a reality at NPS.

"Seeing this room really shows how far we've come since I joined NPS in 1990. Twenty years ago, when I began teaching, there was only one option … blackboard and chalk. Once we saw TEAL, we felt we owed it to our students to find the space and resources to adopt the design at NPS," said Dell. "This really is a beautiful classroom … I think this will be a wonderful facility for our students."

Graduate School of Operational and Information Sciences Dean Peter Purdue echoed Dell's sentiments at the TEAL ribbon-cutting ceremony on January 6, adding, "TEAL will only enhance what we're doing with our students."

Purdue, Fricker and Dell all hope that the new classroom serves not only for the benefit of their students, but also as an example that can be replicated for the "common good" of all NPS students.

"Not only is this of great value to the OR department, but it's also something we can demonstrate to the rest of the institution and [show] there are other ways to putting together a classroom, there are other ways of getting your students involved," said Purdue.

"I hope this room will serve as an example that will soon be replicated at NPS for the benefit of students in other departments" agreed Dell.

Jonathan Russell, Director of Academic and Media Systems at NPS and his team of ITACS staff brought the classroom to reality, facilitating the design and construction of the futuristic learning facility. When describing the advanced facility, Russell referenced an old proverb that essentially sums up the thought behind the room's potential.

"On the main presentation display, we have an old Chinese proverb that basically sums up the room. 'Tell me and I'll forget; show me and I may remember; but involve me and I will understand,'" Russell said.

OR's decision to develop a TEAL classroom at NPS is already delivering positive results – classes are booked to capacity for the current quarter.

Associate Professor Ron Fricker teaches a class in the new Operations Research Technology Enhanced Active Learning (TEAL) classroom. By taking advantage of modern technologies and collaborative learning dynamics, the new classroom could very well set the standard for future learning environments.

Calendar

February 1
Adm. James G. Stavridis
Supreme Allied Commander, Europe
Commander, U.S. European Command
Secretary of the Navy Guest Lecture
POC Protocol Ext. 2466

February 1-3
Rear Adm. Nevin P. Carr, Jr.
Chief of Naval Research
Director, Test and Evaluation and Technology Requirements
POC Winli McAnally Ext. 3416

February 7-10
Polish Ministry of National Defense Delegation
NPS site visit
POC Protocol Ext. 2466

February 8
Lt. Gen. Michael A. Vane
Director, Army Capabilities Integration Center, U.S. Army Training and Doctrine Command
POC Protocol Ext. 2466

February 11
Del Monte Club Luncheon
La Novia Room, 11:30 a.m.
February 8 deadline for reservations
POC Pat Paulson 375-9668

February 15
President's Day Observed

February 17
Israeli Delegation
NPS site visit
POC Protocol Ext. 2466

February 18
Senator Saxby Chambliss (R-GA)
Senator Lindsey Graham (R-SC)
Secretary of the Navy Guest Lecture
POC Protocol Ext. 2466