ATS Spotlight

On this page:

- Collaborative Virtual Reality
- Future Scholars
- Computation-based Research at ATS
- Student Advanced to Professor Faster Using Portal Resources
- Dancing in Digital Space
- nano Exhibit Opens at LACMA
- More on Santiago de Compostela
- Ecce Homology
- Disabilities and Computing Program Open House
- Stargazing
- CyberSImps in the Portal
- Buckyballs: zero@wavefunction in the Visualization Portal
- Internet2: A New Way to Educate Students
- The Roman Forum: A Quick Trip to Antiquity
- Cathedral of Santiago de Compostela
- David Beaudry's Sound Engine
- ATS, Hammer, SEEDS Use Portal to Develop Innovative Teaching Strategies
- Stat Computing Web Portal Creates a Virtual Community

Collaborative Virtual Reality

Learn about vrNav: /at/vrNav/default.htm

ATS has been working with Iowa State University's Virtual Reality Applications Center to develop the innovative techniques and build the infrastructure to share virtual reality models across the Internet. This technique called Collaborative VR was added into the vrNav software, which is normally used to fly through virtual world models in the Portal. Collaborative VR was demonstrated in April between the Portal and Iowa State's Human Computer Interaction Center.

Here's how it works. With Collaborative VR now built into vrNav, vrNav is started up on the same model in two different facilities. As the people at one location fly through the model, the vrNav they are using controls the vrNav at the other facility so that it flys identically. The audiances at both locations see the same view of the model simultaneously.

At the same time that people at UCLA were modifying vrNav, research at Iowa's VRAC were modifying vrJuggler for collaborative use. One of their innovations was to add an avatar to the scene. The avatar, which marks the location of the viewer in the model, is controlled by one side and moves identically through the models at both locations.

Research Scholar Chris Johanson and Visualization Portal Development Coordinator Joan Slottow led the UCLA team to build in rudimentary Collaborative VR into vrNav. Learn more about vrNav at: /at/vrNav/default.htm).

For the April demonstration, Professor John Dagenais, UCLA Spanish and Portuguese Department was in the UCLA Portal as he gave a virtual tour of the Santiago de Compostela model to the audience at Iowa State. The second successful demonstration of Collaborative VR was made the following day between UCLA and the University of Mexico.

The long-term benefit of Collaborative VR, is that it will allow an expert in one geographic location to fly through computer simulated models in real-time at two locations as he delivers lectures to a remote audience.

Back to top

Future Scholars

Roosevelt School third graders take a turn at the Visualization Portal steering wheel to fly through a virtual reality model of UCLA. Virtual UCLA was created by the Urban Simulation Team. More than 1,800 students representing 50 K-12 schools have visited the Portal since it opened in 2001.

Back to top

Computation-based Research at ATS

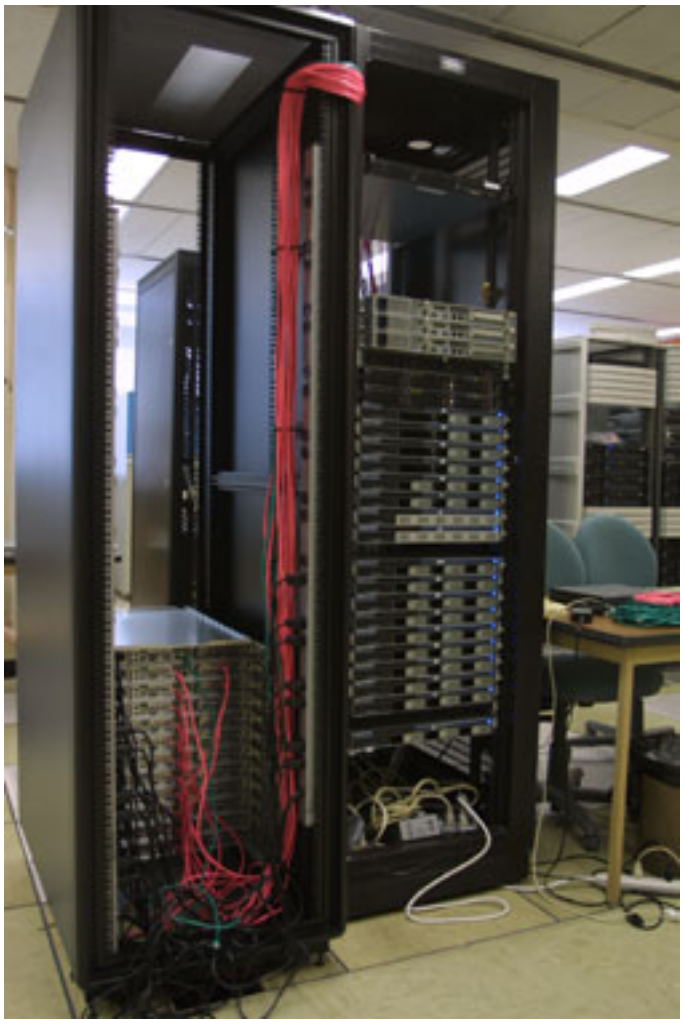
Academic Technology Services has implemented a program for hosting computational clusters in the newly renovated research data center. The core idea is to preserve researcher ownership and on-demand access to the resource while making available data center space and, and in some cases, cluster administration.

ATS will offer tiered levels of service. Tier 1 provides space, enviromentals, and security for researchers who plan to administer their own cluster. Tier 2 continues ATS' existing cluster consulting program for researchers who want to locate their cluster in their own space but need support in its configuration. Tier 3 (full service) provides Tier 1 service levels with the addition of ATS system administration, storage and archival services.

ATS has established a long-range goal of eventually supporting a total of 1,200 nodes and is currently identifying the required infrastructure to support such a resource.

ATS is already involved in two cluster-hosting arrangements.

Plasma Physics Cluster: Academic Technology Services has submitted a RFP on behalf of the Plasma Physics group for a 256-node, 512-processor computer cluster to advance research and education in broad and diverse areas of plasma science. Vendor selection is expected to conclude in this month. The cluster will be built using a $1



million National Science Foundation Major Research Instrumentation (MRI) grant to UCLA Physics faculty. The cluster will be housed in the UCLA research data center.

California NanoSystems Institute (CNSI) Cluster: The CNSI Computational Committee is now in the process of upgrading their HP cluster. ATS - through the Technology Sandbox - will conduct benchmarking on 3 HP products: a new dual-Xeon node, the fastest Itanium 2 node, and a mid-range Itanium 2 node. ATS will also be investigating a new switch that will allow CNSI to upgrade to a total of 50 to 60 nodes and plans to add an HP backup system with this upgrade.

For information on cluster hosting at Academic Technology Services, contact Bill Labate at: labate@ats.ucla.edu or 310-206-7323.

Back to top

Student Advances to Professor Faster Using Portal Resources

Abdul-muttaleb al-Ballam earned his Ph.D. in architecture and is embarking on a career as a university professor a little more quickly than he might have, thanks at least in part to UCLA's Visualization Portal and Modeling Lab. al-Ballam is one of six people who have used the Visulization Portal to work on or defend their dissertations.

"With the facilities at ATS, I was able to finish my dissertation in one year," al-Ballam said. "This would have taken me three years in a different place."

Al-Ballam, who came from Kuwait to study at UCLA, had been doing his computer-aided design work at another digital facility on campus when a fellow

student introduced him to the high-speed world of ATS.

“The Modeling and Visualization Lab is what impressed me because they had many types of software that I needed in order to accomplish my dissertation,” al-Ballam said. “I could build my 3-D urban models in Creator and transform them into VRML Code. That’s a 3-D representation language for the Web. From there, I could take the code and manually change it and enhance it.

“With the availability of fast PCs equipped with very fast video cards, which enable you to run the real-time animation, I was able to shorten the project time,” al-Ballam said.

For his doctoral dissertation, al-Ballam developed a digital teaching tool that he hopes will help college architecture students better understand how an urban environment evolves through the ages. It focuses on the Lebanese city of Baalbek and was designed to be viewed in real time over the Internet. It allows students to “fly” through the streets of the ancient city, studying the influence of the numerous cultures that settled there over a span of 13 centuries. “It gives a good idea of how certain urban evolution has happened,” al-Ballam said. “As a student moves through the model, he will witness the buildings change with time. It’s a virtual time machine.”

Al-Ballam, who holds a master’s degree and bachelor’s degree in architecture, explained the importance of understanding how different cultural influences on urban development are related. “When a historian interprets history without an overall view of the connection between cultures, then he has a problem. He doesn’t see how the city evolved continuously. With my tool, he’ll be able to see this continuous evolution and he’ll have less of a chance to be biased against certain cultures.”

As his model was developing, al-Ballam would invite his professors and advisers to Portal for viewing and critique sessions. He also used the Portal for the successful defense of his dissertation before his doctoral committee. “The setting of the portal is very professional,” he said. “It has elevated my project. There is no other place on campus where you could find a wide-screen projector. Seeing my project there helped my committee “live” the model.”

With his new Ph.D. degree in hand, al-Ballam is returning to his homeland where a teaching position awaits him at Kuwait University. He said his time in the Modeling and Visualization Lab and in the Visualization Portal has inspired him to work to reproduce the same kind of facilities at home.

Back to top

Dancing in Digital Space

Dancer Norah Zuniga Shaw, Department of World Arts and Cultures, used the Visualization Portal to teach an undergraduate course that examined the relationship between emerging technology and the arts. Shaw and her students linked up with their counterparts at the University of Riverside to develop movement and media improvisations that bring together live dancing bodies, virtual reality models, streaming media and **OpenMash** videoconferencing technologies.

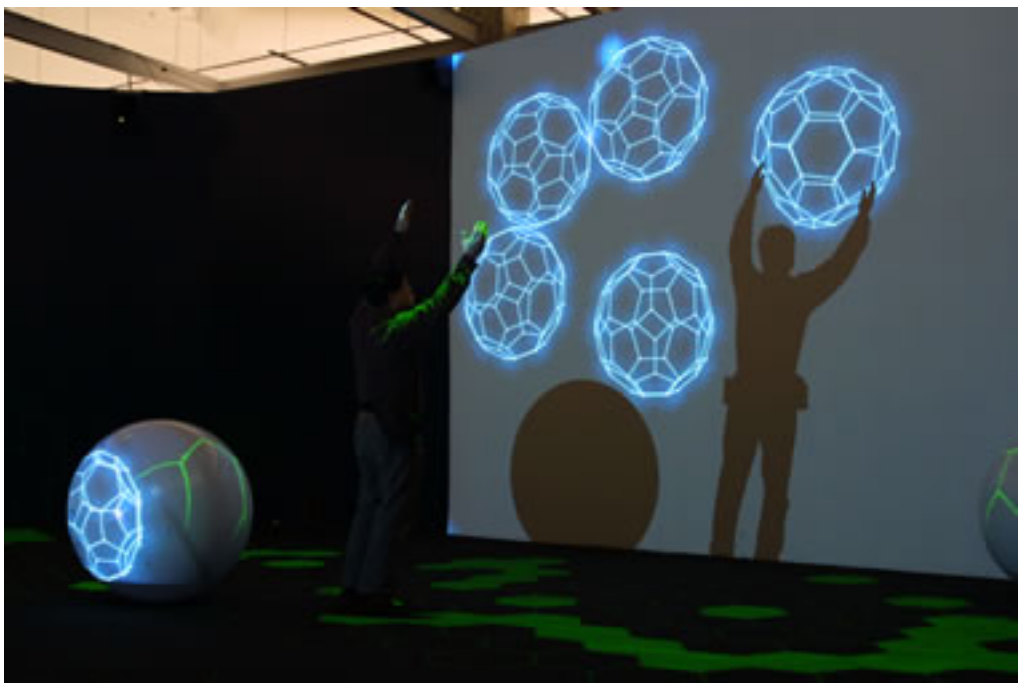
Read the course proposal.

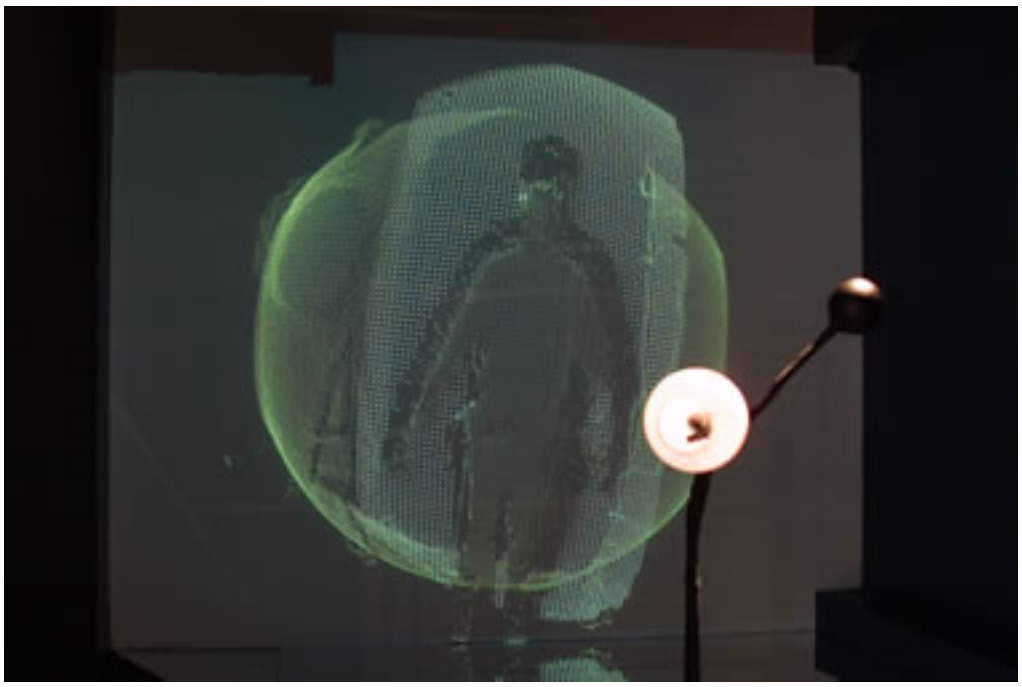
See more photos.

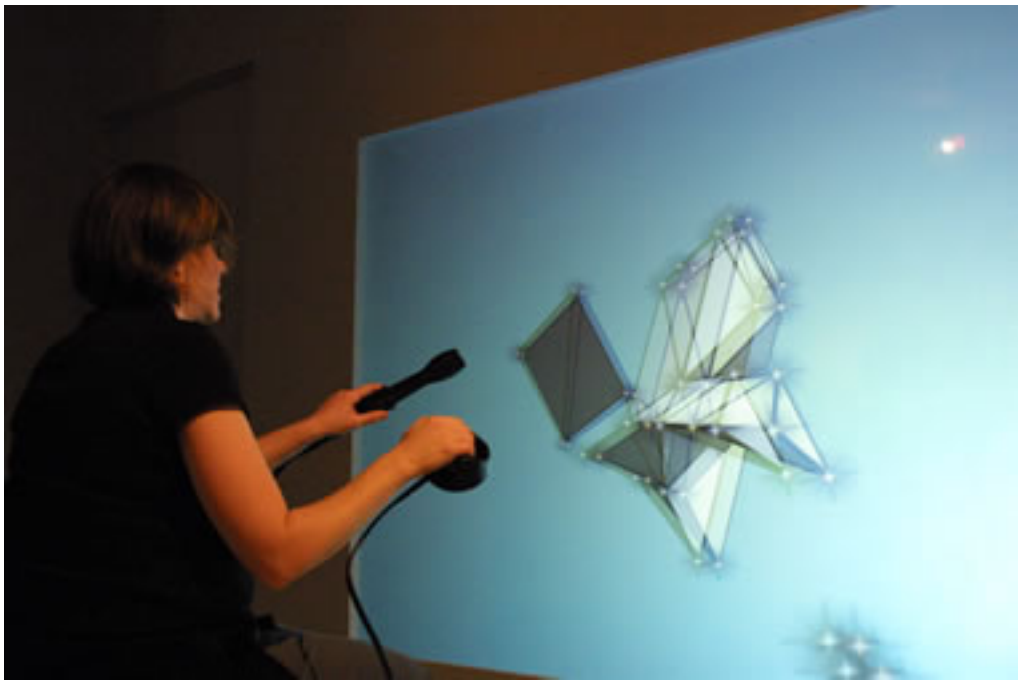
For more information see: www.zunigashaw.com.

Back to top

nano Exhibit Opens at LACMA; buckyballs Bounce in the Portal







In Victoria Vesna's world, science is artistic and art is scientific. Vesna is a media artist, and she defines her art as "experimental research." A professor at UCLA's School of the Arts and Architecture, she is chair of the school's Department of Design | Media Arts and is a renowned master of her genre. A media artist, Vesna explains, is "someone who works with technology and collaborates with many different disciplines, looking at contemporary issues that are raised by scientific and technological innovations."

In her field, the computer is not a tool - it is a medium, like oil colors or a piece of clay. And her creations aren't merely physical something on display in a gallery or museum. They also exist in the virtual world of the Internet.

"My goal is to show that these worlds have a distinct quality in relation to time and navigation but are not separate, and one is not more important than the other," she said.

Vesna's primary world is art, but in the past decade, her interests and curiosities increasingly have crossed into the realms of science and technology.

She says she finds "science labs much more fascinating then artist studios." As a result, her numerous collaborations with scientists should come as no surprise. In particular, she has been teaming up with those working at the atomic and molecular levels in the field known as nano technology.

One of her more recent works, titled, "zero@wavefunction: nano dreams & nightmares," was created in collaboration with noted UCLA nano scientist James Gimzewski in tribute to her fascination with hexagons and their role in nature. The work incorporates virtual buckyballs the nickname given to a hollow, sphere-shaped carbon molecule reminiscent of architect R. Buckminster Fuller's geodesic dome.

Zero@wavefunction is meant to simulate the way a nano scientist manipulates an individual molecule projected on a monumental scale. Software authored by then-UCLA Design | Media Arts student Josh Nimoy allows a viewer both in person, looking at a giant screen, and via the Internet to manipulate the buckyballs by activating a series of visualizations, sounds and texts.

The work has become a permanent installation at the Visualization Portal. Academic Technology Services was instrumental in the work's creation. "Without their help, this piece simply would not have been achieved in time to premiere at the Biennial of Electronic Arts in Perth, Australia, in August 2002," Vesna said.

Vesna also worked with ATS staff as well as Design | Media Arts students when she redesigned the entire California NanoSystems Institute Web site, which, like her artwork, is interactive, allowing viewers to change images as they wish.

Zero@wavefunction is at the core of a new work commissioned by LACMALab. nano opened this month at the Los Angeles County Museum of Art and will be on exhibit through September 2004. Once again, Vesna has partnered with nano scientist Jim Gimzewski to create what she calls a "groundbreaking exhibition that will immerse visitors of all ages in a visceral, multimedia experience of the convergence of computing, nano science and molecular biology."

Vesna says visitors to "nano" interact with multimedia representations of atomic- and molecular-scaled structures. They experience the exhibit through their eyes, ears, hands, "even through their feet as they wander over a reactive floor that mimics the structure of graphite," she said.

The UCLA Technology Sandbox a place where innovation and collaboration are encouraged - provided Vesna and her team with a testing ground for various elements of nano. "The ATS Sandbox's support has proved to be critical in the production of these new works," Vesna said. "These projects are viewed by the public at large and support the creative work of UCLA artists, scientists and humanists who work collaboratively to promote new ways of thinking and being in the ever more complex world we occupy."

Back to top

Take a Step Back in Time - Santiago de Compostela Revisited

Portal visitors made a virtual pilgrimage to 13th century Spain to visit ***Santiago de Compostela*** this month during a two-day history and virtual reality conference hosted by Professor John Dagenais, Spanish and Portuguese Department. Highlight of the conference was a concert by the Medieval singing group, UCLA Sounds, held in the virtual cathedral. This was one of the first truly "mixed" virtual reality performances, where live performers were placed acoustically in a virtual model of the medieval cathedral Santiago de Compostela.

Read the story of Santiago de Compostela.
Read about the innovative sound server that made the concert possible.
Concert in the Cathedral Program

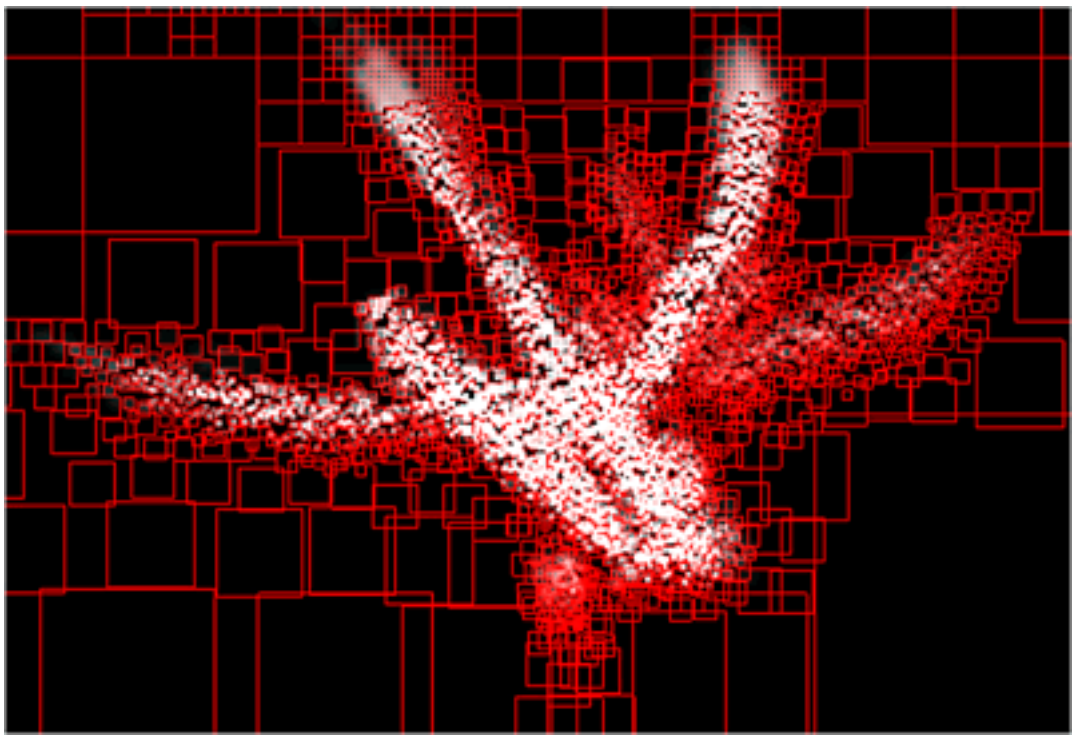
Back to top

Ecce Homology

Multimedia Links:

See the Ecce Homology video:

- Quicktime Progressive



Ecce Homology Exhibit Merges Art and Science

Imagine a work of art that provides an individual viewer the opportunity to become part of a complex science experiment at the same time that it offers beauty and a meditative moment.

Ecce Homology **&#65533;** a 60-foot-long, 12-foot-high interactive art installation that uses a variety of innovative computer technologies is such a work, and it&#65533;s set to open as part of the Fowler Museum&#65533;s &#65533;From the Verandah&#65533; exhibit on Nov. 6.

Several projects at UCLA in the past two years have been aimed at tying art and science in a way that will draw in lay audiences and allow them to become acquainted with sciences that include genomics, proteomics, and nanotechnologies. *Ecce Homology* **&#65533;** the latest of such art-science blends, is an artistic exploration of the human and rice genomes.

At the Fowler exhibit, visitors will become part of a huge projection in which they can discover evolutionary relationships between human genes and those from a rice seedling. A custom computer vision system will track each visitor&#65533;s movements and create light-filled traces into the actual projection. This will allow the visitor to interact with luminous pictographic projections **&#65533;** visualizations of actual DNA and protein information **&#65533;** as the viewer stands in front of the projection surface.

Each pictogram represents either a human gene or a gene from the rice genome that is part of metabolic pathway for the process by which starch is broken down into carbon dioxide. The

Download (low bandwidth)

- Quicktime Streaming (high bandwidth)

pictograms are both scientifically accurate visualizations and metaphors for the cycling of energy and the unity of life.

Each viewer [illegible] by placing his body into the projection area and moving slowly, performs a scientific experiment that looks for evolutionary relationships between the human and rice genomes. This artistic experiment is the same experiment conducted by researchers participating in the world-wide genome sequencing projects that is done via web-based servers and interfaces using a tool called [illegible]BLAST.[illegible]

BLAST (Basic Local Alignment Sequence Tool) is the method to access what is currently known in genomic biology. Almost every life science-related research laboratory in the world uses BLAST, making it the most widely used data-mining tool in history. The national Center for Biotechnology Information receives more than 100,000 BLAST searches daily. Despite its ubiquity, for most researchers BLAST is an unseen process.

Ecce Homology is an artistic representation of the BLAST process. While participating in the art installation, each visitor initiates the BLAST operation to generate automated comparisons of the human and rice genomes, which are shown through changes in the pictograms.

Ecce Homology was created by *in silico v1.0* [illegible] a group of UCLA artists and researchers whose work bridges art and science through the use of dynamic media. Ruth West, an artist and molecular genetics researcher is leader of *in silico v.1.0*. Ecce Homology is the result of a creative collaboration between artists and scientists Ruth West, Jeff Burke, Cheryl Kerfeld, Eitan Mendelowitz, Tom Holton, JP Lewis, Ethan Drucker, Weihong Yan.

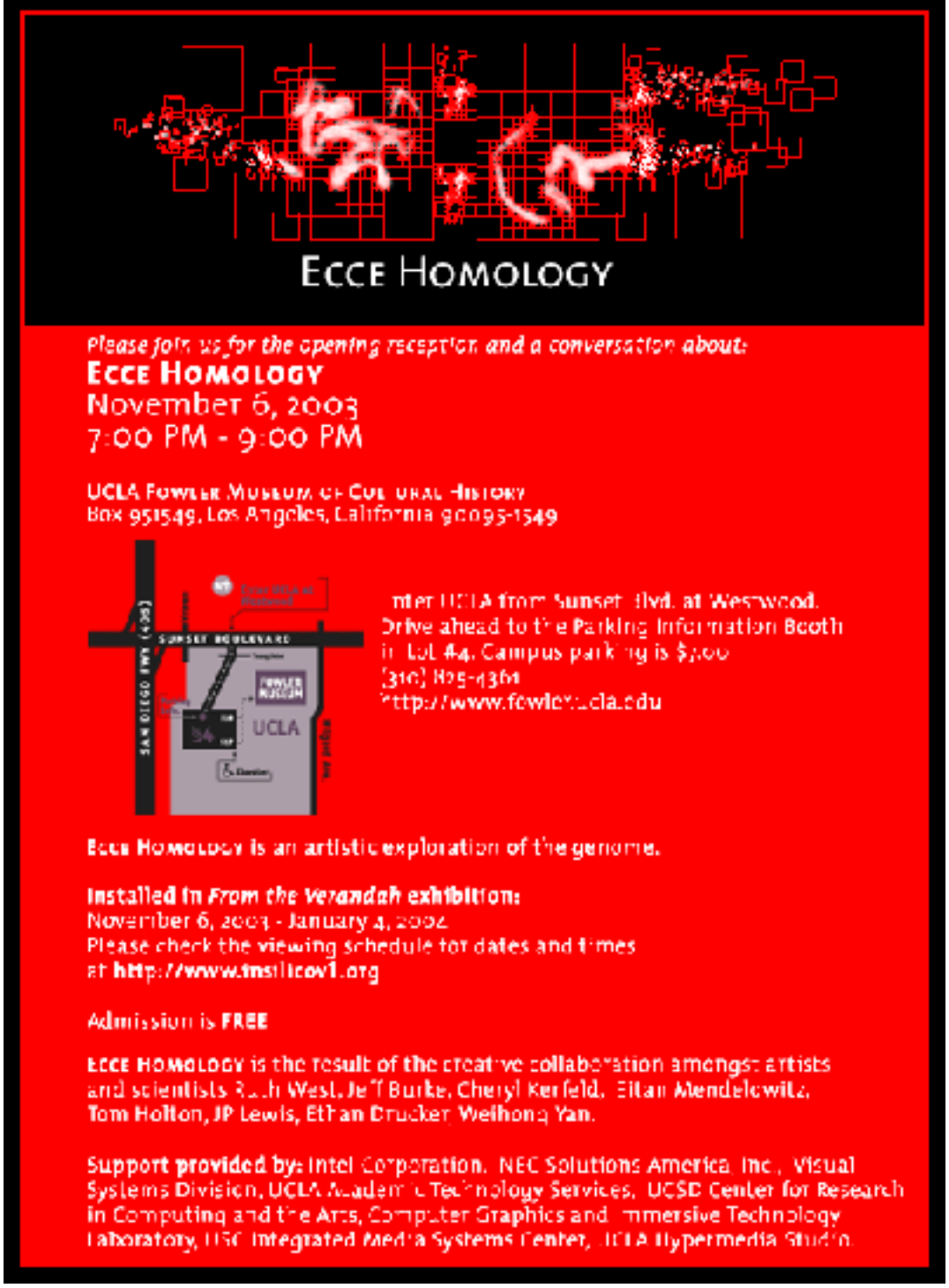
The project is being supported by several academic and commercial organizations, including UCLA[illegible]s Technology Sandbox, Academic Technology Services, Intel Corporation, NEC Corporation, the UC San Diego Center for Research in Computing and the Arts, and the Computer Graphics and Immersive Technology Laboratory, USC Integrated Media Systems Group.

For more information, visit:

http://www.insilicov1.org

www.fowler.ucla.edu

www.ats.ucla.edu.



Back to top

Disabilities and Computing Program Open House

Multimedia Links:

Patrick Burke and John Pedersen in the Disabilities and Computing lab on Wednesday, Oct. 29 show off the latest adaptive computing technologies available. Demonstrations of state-of-the-art technologies in screen-reading, magnification, voice recognition, scanning and reading and study software.

For more information about the Disabilities and Computing program, see: www.dcp.ucla.edu

Back to top

Stargazing

The Universe

Studying the birth of the universe has traditionally been a matter of theory, prediction, speculation, and more recently, computer simulation. But today, astronomers such as UCLA's Matt Malkan are able to look deep into the sky and observe the real thing as it appeared billions of years ago. Highly advanced telescopes, such as the Hubble Space Telescope and the Keck in Hawaii, have dramatically changed the field of astronomy. Thanks to these telescopes, Malkan and others can view the infancy of very distant galaxies back when their stars had just begun to throw off detectable light.

And, thanks to UCLA's Visualization Portal, Malkan and other UCLA researchers are able to bring their work to students, other researchers and broader audiences.

Multimedia Links:

OuickTime Movie of the Universe:

- High Bandwidth
- Low Bandwidth

�The Portal allows us to look pretty closely at these rather horrendously complex simulations. A supercomputer can simulate literally millions of points in a volume of space, more than most humans can comprehend.� The Portal offers a 3-dimensional moving display of a computer simulation, making it easier for the human mind to grasp.

�We�re using telescopes as time machines so we can look back in the early days of the universe and see what these young galaxies are doing,� Malkan said. �It takes the light rays that we�re detecting more than 10 billion years to travel from where they started � from when they were produced � and they leave their galaxies carrying a lot of interesting information.�

The hope is that by studying these faraway galaxies in their formative stages, astronomers will be able to update scientific theory and prediction to answer lingering questions about the structure of the universe and the evolution of our own galaxy - the Milky Way.

Malkan�s work focuses on the photons � or light particles � that infant galaxies produce, especially when a star is created. Once the photons are collected on the Keck�s or the Hubble�s giant mirror, Malkan works to determine how long they�ve existed and how far back in the history of the universe he is peering. He�s able to make these measurements by comparing the size of the universe when the light rays first began their journey through space to the current size of our ever-expanding universe. A relatively new calibration of the universe�s expansion has made it possible for astronomers to put a fairly accurate time stamp on each of the galaxies under observation. Malkan is working closely with University of Zurich physics theorist Ben Moore, a proponent of the �dark matter� theory of galaxy formation.

�The Portal is unique in letting us look at these millions of points in space simultaneously,� Malkan said. �We can watch the universe move forward or backward in time and see how it�s changing before our eyes.� He also is able to move around inside the simulated universe and see how it looks from different locations.

As a teaching tool, the Portal is incomparable, Malkan added. �Watch this model in the Portal for five minutes and you will understand better how our universe formed its structure,� Malkan said.

Back to top

ﷺCyberSImpsﷺ in the Portal

UCLA performers in the foreground and Stanford performers on Portal screen in the background.

Multimedia Links:

Video clips of the performance:

- High Bandwidth
- Low Bandwidth

This video clip shows a scene about a child and her grandfather on a fishing trip. Actors from UCLA and Stanford simultaneously act out the same scene. The catch is that the actors from each place take turns making up dialog and acting out a story as the actors from the

Faculty Advisor David Beaudry (left) and student Alex Hoff.

A distributed, improvisational performance was presented in the Visualization Portal earlier this month as an Advanced Sound Design class project. Visiting Assistant Professor David Beaudry, UCLA Department of Theater and Consulting Professor Elizabeth Cohen, Information Studies, were faculty advisors on the project which was designed to explore the possibilities and challenges of creating a theatrical performance that occurs simultaneously in two geographical locations. The performance featured two groups of theatrical improvisers - one group at Stanford's Wallenberg Hall and the other at UCLA's Visualization Portal.

The UCLA-Stanford Distributed Performance Project - created by Visiting Assistant Professor David Beaudry, UCLA
Department of Theater, Consulting Professor Elizabeth Cohen, Information Studies, and Stanford student Daniel
Walling - explored the possibilities and challenges of creating a theatrical performance that occurs simultaneously in two geographical locations. The performance featured two groups of theatrical improvisers - one group at Stanford's Wallenberg Hall and the other at UCLA's Visualization Portal. A group of theater sound design students from UCLA created immersive, multi-channel environments and sound effects to support the improvisations. The improvisational groups were connected by real-time audio and video streams using the Internet2 backbone.

This project addressed several problems.

First, it attempted to overcome the geographical distance between actors and designers during the performance.
Previous attempts to do this have fallen short due to network latency issues that negatively impact the quality of sound and video. Improving one was generally at the sacrifice of the other, and therefore it was impossible to create a viable forum for exchange. Recently, however, technological advances - particularly in networking allowed the project participants to create viable virtual performance spaces: two physical locations joined by the Internet to create a single, unique and fluid performance environment.

The second goal was to address the problem of theatrical sound design for both an improvised performance and a
networked performance. In traditional theater - where audiences are located in a single location - sound designers build cues and sound effects to support the action on stage. When building those cues, designers usually have a script from which to design the sound component and a predictable (i.e. linear) order of execution during performance. The designers on this project were challenged not only to create interesting and complex sound as a viable part of an improvised performance, but they also had to design the sound to be engaging in both geographical locations. This dual challenge required a rethinking and restructuring of the traditional methods used in theatrical sound design.

The third goal of this project was to effectively archive the performance. How does one

other venue imitate them. On the clip you'll see the UCLA performers in the foreground and the Stanford actors on the Portal screen in the background.

document and archive a
collaborative theatrical performance when the performance bodies are in physically distinct locations and the collaborative environment is virtual? How does one handle the archiving of eight channels of audio, two video streams, nine actors, and two audiences that were involved in this production? Documenting such an event - not
just the performance but the process as well - was a formidable challenge.

Project Goals

- To enable spatially distributed improvisational performance.
- To identify the technology that enables spatially distributed performance.
- To understand what contributes to the perception of ensemble.
- To create a robust digital archive of the performance.
- To address the problem of theatrical sound design in entirely improvised performances, as well as
network-based performances.

Several important components comprised this performance project.

Audio and Video Streaming

The audio connection is supported by the StreamBD software - created by the SoundWIRE research group at Stanford's CCRMA - streaming uncompressed, multi-channel, professional-quality audio over Internet2. StreamBD
is research-prototype software that provides low-latency uncompressed audio streaming over high quality networks. It was created to run on "CCRMAlized" computers running Linux/OSX. The delays in streaming are only a few milliseconds above latency.

The project uses OpenMash for video streaming. OpenMash allows for high-quality video streaming approximately
150 milliseconds above network latency. The project also uses RTPtv, an open-source software package that runs
on Linux and Windows to send and receive high-bitrate "broadcast quality" television - stereo audio and either
720x480 or 720x576 interlaced video (D1 video) or 352x240 or 352x288 progressive video (CIF) - over IP using
the IETF RTP protocol and M-JPEG (Motion JPEG).

Sound Design

The sound designers built custom software and interfaces for real-time control and processing of both live and
prerecorded sound. The software uses IRCAM/Cycling74's multimedia programming environment, Max/MSP.

Faculty Advisors

David Beaudry, Visiting Assistant Professor, UCLA Department of Theater Virtual Reality Audio Specialist & Audio Technologist, UCLA Visualization Portal/Academic Technology Services

Elizabeth Cohen, Consulting Professor, Electrical Engineering, Stanford University and Visiting Professor of Information Studies, UCLA

Chris Chafe, Professor of Music, Stanford University, Director CCRMA

People Involved

Actors - All of the performers are current members or alumni of the Stanford Improvisers (SImps), coached by

Patricia Ryan.

Sound designers - Both sound designers were students in David Beaudry's Advanced Theater Sound Design class.

Archivists - All archivists were students in Elizabeth Cohen's class.

Coordinators:

UCLA – David Beaudry, Visiting Asst. Professor in Sound Design, UCLA Dept. of Theater, and Virtual Reality
Audio Specialist, UCLA Visualization Portal.

Stanford University – Daniel Walling, Stanford University.

Back to top

zero@wavefunction in the Visualization Portal

zero@wavefunction: nano dreams and nightmares, a unique UCLA Media Art/NanoScience collaboration was recently unveiled to a campus audience at the Visualization Portal.

Created by Victoria Vesna, chair of the Department of Design/Media Arts and James Gimzewski, a leading expert on nanotechnology and a professor in UCLA's Department of Chemistry and Biochemistry, zero@wavefunction was conceived to help make nanoscience more accessible and understandable to the broader public. Buckyballs (shown in the photo) respond via sensors to movement of a person's shadow.

See a movie of buckyballs:
Quicktime (high bandwidth) / Quicktime (low bandwidth)
For more information, go to: http://notime.arts.ucla.edu/zerowave

Back to top

Multimedia Links:

QuickTime Movie of Buckyballs

- High Bandwidth
- Low Bandwidth

A New Way to Educate Students

Medical Students viewed a live orthopedic surgery from the Visualization Portal as part of an Internet2 member meeting hosted by USC. While doctors in the UCLA Medical Center explained the surgery and answered questions, students were also linked to an orthopedic surgeon at Stanford's SUMMIT, who used a 3-D hand model to further explain the surgery, and to orthopedic surgeons at

Multimedia Links:

- Read more about the Orthopedic Surgery

the conference site. Goal of the project was to explore teaching opportunities provided by Internet2.

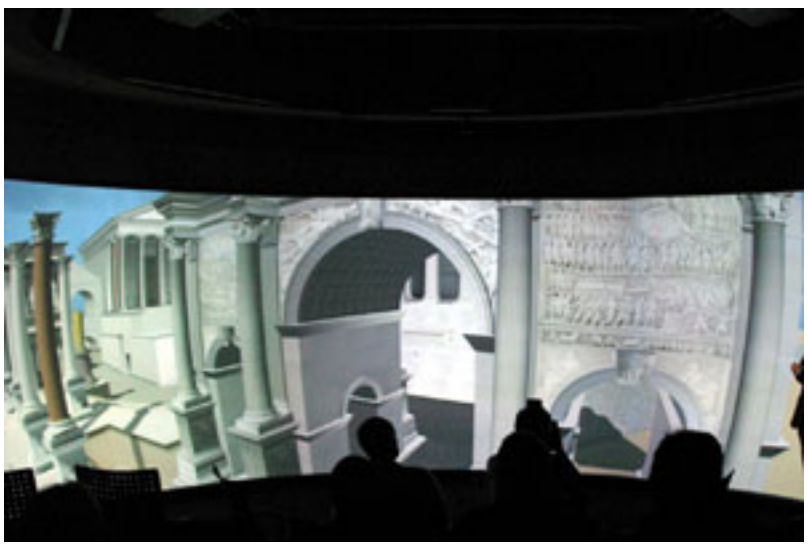
Back to top

- Presentation
- Read more about UCLA at the Internet2 Conference

A Quick Trip to Antiquity

A 3-D immersive computer model of the Roman Forum at the peak of its development just prior to the fall of the Roman Empire was unveiled to a prestigious audience in the Visualization Portal in January. The audience included Dr. Paolo Liverani, Curator of Antiquities for the Vatican Museums and scholars from UCLA and other universities. Dr. Bernard Frischer, director of UCLA's Cultural Virtual Reality Lab, Dean Abernathy, chief modeler of the visualization, and Dr. Diane Favro, CVR Lab associate director for research and development, talked about the value of the model and the huge effort involved in creating it.

Believed to be the most complex digital model ever created of an archaeological site, the model shows 22 buildings and monuments based on the latest research on the Forum. Only two of the structures both badly damaged survive in Rome today.



Multimedia Links:

- Voice of America multimedia feature
- View video of fly-through: QuickTime High Bandwidth / QuickTime Low Bandwidth

Back to top

Cathedral of Santiago de Compostela

Professor John Dagenais, Department of Spanish and Portuguese, uses the Visualization Portal to show a model of the Cathedral of Santiago de Compostela, the Romanesque pilgrimage cathedral of the medieval period.

The digital model recreates the medieval cathedral and allows students and researchers to experience the space of the cathedral as it would have been seen by medieval pilgrims to Santiago de Compostela.

The simulation serves as the background for Professor Dagenais' introductory course in Medieval Spanish literature and as an ongoing research project for students in a summer-session class studying and traveling the pilgrimage route. The model is also beginning to be used by architectural historians and archeologists to pose questions about the development of the building over time and as a way of testing various scenarios for archeological reconstructions. This restoration project shows the building as it appeared when dedicated by Bishop Pedro Munoz on April 3, 1211 A.D.

Dean Abernathy, Architect, a principal member of the **Cultural VR Lab** and a Ph.D. candidate at UCLA, was chief modeler on the project.

Doing some additional research work in the ATS Visualization Lab on the Cathedral Santiago de Compostela project:

Multimedia Links:

- Compostela Fly-through High Bandwidth
- Compostela Fly-through Low Bandwidth

Dean Abernathy, UCLA Cultural VR Lab (left); Jose Suarez Otero, Archeologist and Conservator, Cathedral of Santiago de Compostela (center); John Williams, Visiting Mellon Professor of the History of Art and Architecture, University of Pittsburgh (right); John Dagenais, Professor of Spanish and Portuguese (top).

Jose Suarez Otero, Archeologist and Conservator, Cathedral of Santiago de Compostela (left); Dean Abernathy, UCLA Cultural VR Lab (center); John Williams, Visiting Mellon Professor of the History of Art and Architecture, University of Pittsburgh (right)

Back to top

David Beaudry's Sound Engine

Musical Arts Doctoral Candidate David Beaudry used the unique capabilities of the Visualization Portal for his research on finding new forms of musical expression for acoustic instruments through interactive digital technology. His goal is to "return interactivity to musical performance and generate new performance media," which involves designing pathways for communication between acoustic instruments and computers. Learn more about David's work by viewing his video or reading his proposal.

Multimedia Links:

David Beaudry Sound Engine - Low Bandwidth | Beaudry Sound Engine - High Bandwidth

David Beaudry Sound Engine - Surestream

Read David Beaudry's Proposal

Back to top

ATS, Hammer, SEEDS Use Portal to Develop Innovative Teaching Strategies

Academic Technology Services, Seeds University Elementary School, and the UCLA Hammer Museum have finished the successful pilot of a Visual Thinking Strategies program designed to introduce elementary teachers to an innovative teaching strategy for young students. The pilot project also explored a variety of educational and training possibilities offered by UCLA's Visualization Portal and Internet2. ATS is currently working with Linda Duke, director of Education at the UCLA Hammer Museum, on a videotape of the project that will be shown at the Internet2 Fall conference to be held at USC.

The Visual Thinking Strategy is developed by Psychologist Abigail Housen and art educator Philip Yenawine - focuses on helping young students learn to appreciate the arts and apply critical thinking skills learned in art appreciation to other fields.

The project had three primary objectives to develop a model for VTS training that employs Internet2 and can be scaled up for use in public schools, to expose pre-service teachers through videoconferenced participation to a model of rich, probing discussion among colleagues about their teaching, and to experiment using the VTS to prepare students to actively engage with on-screen images that might be used in later distance-learning initiatives.

"Organizers of this pilot believe there is strong evidence to indicate that the skills and behaviors fostered in students by the VTS are exactly those needed for a satisfying educational experience with other computer-based instructional programs," said Ms. Duke.

The VTS uses facilitated peer discussion of art images to help students develop critical and creative thinking, evidence-based reasoning, advanced looking, and communication skills.

"This is such a rich curriculum," said Sharon Sutton, coordinator of Technology and Outreach at Seeds UES. "The benefits for the students and the teachers are just tremendous." Ms. Sutton worked with Ms. Duke to create the program at UES.

Nine UES teachers completed the training, along with several UCLA graduate students and Los Angeles Unified School District staff members. ATS videoconferenced the teacher training and debriefing sessions from UES to the Visualization Portal and to the Massachusetts Institute of Technology over Internet2.

Back to top

Stat Computing Web Portal Creates a Virtual Community

UCLA's new Statistical Computing Web Portal - located at http://statcomp.ats.ucla.edu - offers visitors an easy way to learn more about commonly used statistics packages at the same time it provides an opportunity for people who are interested in statistical computing to interact with each other. One of UCLA's **Centers for Scholarly Interaction**, the UCLA Stat Computing Portal is a virtual meeting place for the UCLA research and teaching community and for collaboration among statistical consulting centers located around the world. See: http://statcomp.ats.ucla.edu/propcollaboration.htm

The Stat Computing Portal, which provides links to web sites for commonly used statistical packages such as SAS, Stata, and SPSS, can also search across those sites to save users the time and effort of searching each page individually.

The Stat Computing Portal augments the ATS Statistical computing pages located at /stat/ and other Statistical Consulting services (/stat/Qtr_Schedule.htm).

For more information about Centers for Scholarly Interaction, go to: www.itpb.ucla.edu and click on Strategic Plan Areas of Emphasis.

Back to top

Multimedia Links:

- Statistical Computing Web Portal
- Proposed Collaborations
- ATS Statistical computing pages
- Statistical Consulting services
- ITPB