



University of Melbourne Initiates Australia's Ultra-Resolution Global Collaboration Laboratory

Deputy Prime Minister Julia Gillard and Victorian Premier John Brumby today joined politicians, industry, science and media representatives - on both sides of the Pacific

— to experience a powerful next generation ultra-resolution visualisation carried over a superbroadband network linking the University of Melbourne and the University of California San Diego (UCSD)— allows real-time, interactive collaboration across the globe - combining high-definition video and audio with the sharing of ultra-resolution visualisations from a broad range of disciplines. Today's demonstration was an initiative of the Australian American Leadership Dialogue (AALD)— all from the comfort of an OptIPortal room.— from its first overseas telecommunications link in 1872, first overseas airmail in 1935 and passenger flight, 1935, to its first overseas internet connection — at the University of Melbourne - in 1989.— for health professionals in regional Australia or even Antarctica.— is at the forefront of ICT research in Australia through key research centres, CUBIN (Centre for Ultra Broadband Information Networks) and NICTA (National ICT Australia). www.aarnet.edu.au. www.calit2.net, a partnership between UC San Diego and UC Irvine, houses over 1,000 researchers organized around more than 50 projects on the future of telecommunications and information technology and how these technologies will transform a range of applications important to the economy and citizens' quality of life. www.optiputer.net funded by the U.S. National Science Foundation for six years, 2008 will see the establishment of a persistent global collaboration laboratory combining high definition and digital cinema video streams with ultra-resolution visualisation facilities, termed the OptIPlanet Collaboratory, connecting many centres for innovation around the world.

In an Australian first, this next generation platform - set to revolutionise the way Australia interacts with the rest of the world

In the last two months, the University of Melbourne has constructed a massive 96 million pixel "OptIPortal" visualization wall - known affectionately as the "OzIPortal"— constructed from 24 x 30 inch LCD screens, For comparison, a standard PC can show about 1-2 million pixels. Funding for the OptIPortal has been provided by the Victorian Government (\$120,000) and the University of Melbourne (\$500,000).

This ultra-resolution OptIPortal visualisation wall - the largest in Australia - enabled scientists, industry leaders and politicians in Melbourne to demonstrate cutting-edge medical and environmental research to participants in the AALD's West Coast Leadership Dialogue at the University of California San Diego using a novel interactive high-definition television stream over a 1000 megabit/sec ("gigabit/s") super-broadband optical fibre connection.

Bringing the OptIPortal and gigabit/s super-broadband networking together is the cutting-edge expertise of two of the world's leading telecommunications research units - the University of Melbourne School of Engineering's Centre for Ultra Broadband Information Networks (CUBIN) and the California Institute for Telecommunications and Information Technology (Calit2), a UCSD/University of California Irvine partnership. The link-up was made possible by use of the high-capacity backbone of AARNet, Australia's academic and research network, with a connection to the US West Coast using SXTraNSPORT on the Southern Cross Cable Network to the Calit2 network in San Diego via Pacific Wave and CENIC in the U.S.

In Melbourne, Deputy Prime Minister Gillard and Premier Brumby joined Victorian Opposition Leader Ted Baillieu, Federal Minister for Innovation, Industry, Science & Research Senator Kim Carr, Federal Minister for Broadband, Communications & the Digital Economy Senator Stephen Conroy, Victorian Minister for Industry & Trade, Information Technology, & Major Projects Theo Theophanous, and Qantas Chairman, Leigh Clifford. The cross-Pacific discussion included presentations demonstrating the capacity of the OptIPortal by leading neuroscientist, Professor Graeme Jackson, and water researcher, Professor John Langford, both from the University of Melbourne. Participants in San Diego including Director of the Calit2 Professor Larry Smarr, Vice Chancellor for Research at UCSD Professor Art Ellis, and Vice-Chancellor of the University of Melbourne Professor Glyn Davis, were able to quiz Professor Langford and Professor Jackson as if they were in the same room.

Amanda Johnston, an Executive Director at BigPond co-moderated the discussion in Melbourne with Mr Phil Scanlan, founder of the Australian American Leadership Dialogue, in San Diego.

Unique in Australia, the OptIPortal facility brings together two individual concepts - ultra-resolution visualisation walls and high definition video collaboration technologies creating a powerful new tool enabling collaborative research across great distances in real time with participants visually exploring massive data sets.

Melbourne Vice-Chancellor Glyn Davis praises the ingenuity of staff in the University's School of Engineering, Calit2 and AARNet which has made the Melbourne OptIPortal a reality. "They have used the real time and high definition visualisation of the OptIPortal to build the Melbourne facility. This technology is a powerful communication tool which will push new boundaries for higher education and research in Australia."

Dean of Engineering at Melbourne, Professor Iven Mareels, says, "The 'real-time' nature of the technology means people on opposite sides of the world can work together on projects in real-time. For instance, a surgeon in Australia could direct an emergency surgical intervention by operating a robot in Antarctica; scientists in Australia and Japan could share research tools such as the Synchrotron, or operate an underwater robot exploring the Great Barrier Reef

Calit2 Director Professor Larry Smarr notes that today's demonstration marks the entry of Australia into the growing OptiPlanet Collaboratory, enabling innovators around the world to work together on major data-intensive scientific, medical, and environmental challenges. "Based on today's success, we will connect other Australian universities together with universities in the United States and around the world using these advanced technologies in 2008."

"This is a landmark event for Australia-US research communities and represents a quantum leap in broadband communications for Australia," says Chris Hancock, CEO of AARNet. "It means research teams in areas such as medicine, astronomy, science and technology can now visualise larger, more detailed, higher resolution images than ever before. This technology opens up a world of opportunities for collaboration across the Pacific and helps to ensure Australia's place at forefront of global collaborative research."

Leadership Dialogue founder Phil Scanlan says the key to Australia's ability to sustain high community performance is its capacity and commitment to invest in education, science, technology, human capital and related areas of human endeavour that deliver gold medal outcomes.

The University of Melbourne demonstration marks a major milestone in Australia's triumph over the 'tyranny of distance';

About the OptiPortal

With nearly 100 million pixels in view, compared to one or two million pixels for a typical PC screen, the Melbourne OziPortal's HiPerSpace tiled display provides amazing ultra-resolution visualisation.

It was built in collaboration with the OptiPortal team, including experts at the UCSD and UCI campuses of Calit2, at the San Diego Supercomputer Center, and at the Electronic Visualisation Laboratory at the University of Illinois at Chicago.

This technology opens exciting new ways of performing research.

Researchers across the globe will be able to share unique instruments - MRIs, synchrotrons, supercomputers, square km radio telescope arrays - and collaborate to interpret, on the spot, complex data which could range in origin from the artistic world, gaming and cinematography to leading-edge advances in the characterisation of brain function and the human genome.

The current facility will be expanded in a straightforward and modular way to include other collaborators at different sites in Victoria and in other parts of Australia.

With the OptiPortal, scholars in different locations can appreciate the fine details of a work of art, medical scientists can explore a range of images of the brain from different scanning sources all at the one time, researchers can explore new materials constructed by computer.

In a city such as Melbourne, planners can explore, all at once, population density, ethnicity, crime patterns, water consumption, social economic factors, etc. Students in schools and universities can 'go on exchange' with overseas institutions without leaving their classroom. In medicine, it holds the promise of providing access to high quality specialised expertise

The OptiPortal is connected over AARNet's transpacific fibre optic network and uses high definition video. AARNet has pioneered the global use of high definition television streams since 2004 and now adds in the capability of ultra-resolution visualisation.

The resulting OptiPlanet Collaboratory means we can interact with a remote location just as if it was 'right here';.

Some statistics

OptiPortal definition: Combination of a high-definition wall (comprised of 24x30 inch ultra HD monitors) powered by 13 Quadcore PCs (which are equivalent to 52 standard desktop PCs) , running the San Diego Supercomputer Center's Rocks cluster software.

The OptiPortal has 100 times more memory than the average desktop PC (104GB).

The OptiPortal is nearly 50 times higher resolution than the highest resolution HD TV commercially available.

The internet connection (1 Gigabit per second) is about 250 times faster than the standard broadband connection offered in metropolitan Melbourne (4mbps).

The software that powers the OptiPortal is capable of magnifying images to a large size and still keep full clarity, for instance, a scan of the brain can be shown at to the cellular level and maintain full clarity.

The 'secret sauce' that allows Melbourne's OziPortal to be able to show the stunning images shown today is the Cluster-GL for Heterogeneous Systems (CGLX) framework for freely scalable multi-tile visualisation and synchronization.

Melbourne's OziPortal utilizes Calit2's HiPerSpace technology for freely scalable multi-tile visualisation.

About the University of Melbourne

The University of Melbourne is Australia's leading research university, based on a number of indicators. The Times Higher Education Supplement recognized Melbourne as Australia's leading university in technology teaching and research. The University - the gateway for Australia's first overseas internet connection in 1989

About AARNet

AARNet Pty Ltd (APL) is the company that operates Australia's Academic and Research Network (AARNet). It is a not-for-profit company limited by shares. The shareholders are 38 Australian universities and the CSIRO. AARNet provides high-capacity leading edge Internet services for the tertiary

education and research sector communities and their research partners.

AARNet serves more than one million end users who access the network through local area networks at member institutions. For further information, please visit:

About AALD

Founded in 1992, the annual bipartisan Australian American Leadership Dialogue alternates between Washington DC and a major Australian capital city. In recent years, the Leadership Dialogue has also accessed the best institutional infrastructure on the west coast of the USA, in order to engage some of their best and brightest about the next phase of nation building in both countries. The Young Leadership Dialogue was launched in 2007, which brings a pipeline of young leaders to reinvigorate the Leadership Dialogue with fresh thinking and new ideas.

About Calit2

The California Institute for Telecommunications and Information Technology (

About the OptiPlanet Collaboratory

Based on the "OptiPuter" research project (

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