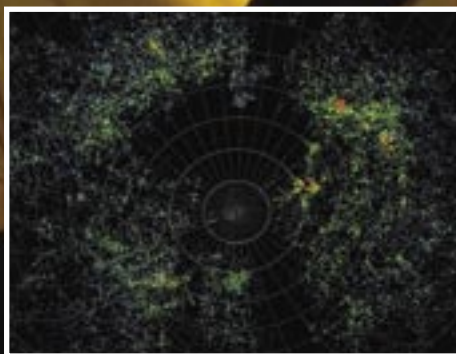


WHEELS

for the mind



See Inside



Preserving our musical heritage

As languages fall into disuse, so too do their musical legacies. In two Northern Territory communities, a team of musicologists is fighting time by using Macs to capture, preserve and publish hundreds of music recordings spanning four decades.

Mac OS X: Getting seen in visualisation circles

The extremely complex requirements of high-end visualisation applications used to demand turbocharged Unix systems. But as Mac OS X extends further into the research community, its Unix roots and powerful GUI are carving out a role at the peak of visualisation circles.

Teaching English, Singapore style

'Think different' has long been associated with Apple technologies. When a Singapore institution used a new approach to setting up a Mac-based computer lab, a group of teachers in training found it easier than ever to do just that.

PRODUCT Round UP

3D FOR THE REST OF US



If you're into 3D, or would like to be, @Last Software's SketchUp may be the thing you've been looking for. Designed to simplify creation of 3D environments, SketchUp lets the user sketch a design that is intelligently transformed into 3D designs using a number of techniques.

The Follow Me tool, for example, pulls a surface along a path to quickly create curved elements. Use the Texture Tweaker to stretch any photo or texture across any 3D surface: design a 3D block and slap a picture of a building onto it, and you've got a ready-made 3D object. The Face Me feature ensures people remain facing the camera no matter how angles change. Recently-released version 4.0 also includes Boolean modelling and a Ruby Scripting Interface for automating most tasks. Change dimensions on the fly to turn ideas into results.

Download a trial or buy SketchUp online for \$US475 (\$666) from www.sketchup.com. For local information, contact 4SITE Design on www.4site-design.com or 0402 131 147.

HEY, ROLL OVER VJ



Video compositing can be difficult and limiting, with predefined filters usually restricting your choice of video manipulation. Designed to work around these limits, Swiss company GarageCUBE's Modul8 is a Mac OS X application offering real-time video mixing and compositing using a tool set that allows real-time rotation, scaling and movement of any QuickTime video, Flash animation and image.

ActiveX-optimised, full-resolution rendering is done in real time thanks to a multi-threaded engine designed to optimise PAL, SVGA, XGA or higher resolution output in full 32-bit colour. Modul8 supports up to ten layers, each with its own settings and media, and full per-pixel transparency combines those layers seamlessly. MIDI and direct keyboard support provide flexible control over video mixing, reflecting the tool's heritage in video mixing for DJs. Anybody working heavily with video, however, is likely to find something to love here.

Modul8 requires Mac OS X 10.3 or higher. Download a demo from www.garagecube.com or buy it online for 295 euro (\$500).

MODERNISE YOUR WHITEBOARD

If you still love your whiteboard but want the ease of digital, eBeam System 3 BT may be the thing for you. A small unit mounts onto the corner of your whiteboard using suction cups; you then draw normally on the board. The mounted unit continually tracks the progress of the pen, converting distance into line trajectories and transmitting your writing and drawings to eBeam System Software running on your Mac. From there, you can manipulate, save and distribute your whiteboard creations however you like. eBeam can also be used to participate in online meetings over the Internet or network.



Wired USB (\$US749.95) and wireless Bluetooth (\$US1199.95) versions are available. Learn more from www.e-beam.com, contact Link Media on (08) 9355 8200. In New Zealand, contact Visual Presentation Solutions on (09) 636 7400.

CRANK UP YOUR WIRELESS

If you're loving your university's wireless LAN but can't bear the constant dropouts and signal fade, you may want to invest in a new antenna. US company QuickerTek offers a full range of antennae specifically designed to improve Airport and Airport Extreme signals within PowerBook models. There's an omnidirectional antenna for aluminium 15 and 17-inch PowerBooks, directional antennae for Titanium PowerBooks and PowerMac G5s, and a whip antenna for the 12-inch PowerBook. QuickerTek claims the antenna will double or triple usable WLAN range.

For now, QuickerTek antennae must be brought in from the US, at a cost of around \$US90 (\$126). Check out www.quickertek.com/wheretobuy.html for online stores offering the products.

DVDS LIKE THE STUDIOS DO



If DVD authoring has become popular, dual-layer DVD writers will make it even more so by doubling the amount of video content and data storage that can be squeezed onto a disk, to 8.5 GB. Sony was first to market with its DRU700A dual-layer writer, which is backwards compatible with all DVD+/-RW standards and comes in \$269 internal and \$499 external flavours.

Iomega recently launched its own foray into double-layer DVD with the Iomega Super DVD Writer 12x Dual-Format USB 2.0 drive, while LaCie has also weighed in with its 8x d2 DVD+/-RW Dual Layer drive, costing around \$475. The only catch: DL media is still rare as hen's teeth and expensive. But that will soon change – and it never hurts to be ready.

Contact Sony on 1300 137 669 or www.sony.com.au; Iomega on (02) 8875 7851 or www.iomega.com.au; or LaCie on (02) 9669 6900 or www.lacie.com.au.

VISUALISE YOUR REFERENCES



As any postgraduate knows, keeping up with research bibliographies can be time-consuming and difficult. Thomson ISI ResearchSoft, whose EndNote has become the de facto standard for citation tools at many universities, has taken a new spin on research assistance with the launch of RefViz, a visualisation tool that uses graphical techniques to identify new references.

Using thematic analysis techniques, RefViz analyses large volumes of references according to their content, then plots their relative relevance to a research category in visual terms. Relative weighting reveals relevance, for example by judging how closely two particular terms are found within the text. This makes it easy to identify particular clusters of related content, and to identify new content that may be related to the research in ways previously never envisioned.

Download a trial from www.refviz.com or contact AMPL Software on (02) 9440 0269.

END THE REMOTE CONTROL MADNESS



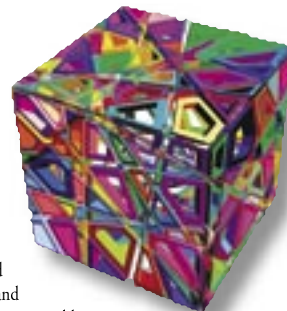
This one's just good fun. If you're drowning in remote controls, turn your Macintosh into a universal remote using iRed, an application that lets you design on-screen virtual remote controls that replace real ones when used in conjunction with IRTans, a USB-connected breakout box that lets your PC or Mac communicate using electronics-friendly infrared signals. It also works the other way: control your computer using a conventional remote control – for example, allowing easier listening to your MP3 collection or facilitating navigation of your PowerPoint presentation.



iRed is available from www.filewell.com/iRed/ and requires Mac OS X 10.2.6 or later. IRTans must be purchased from its German manufacturer online at a cost of 99 euros (\$169) for the device and 20 euros (\$34) for shipping. See www.irtrans.de/english/ for more details.

COMPLEX MATHS MEET THE WEB

Mathematica's unfailing complexity and robust visualisation capabilities have earned it a solid reputation amongst mathematical circles. webMathematica extends this reputation online, providing a construction kit that lets Web developers add live Mathematica elements to their Web sites. Visitors to the sites can input equations in real time, with Mathematica publishing the results instantly.



The combination of Mathematica server and Web front-end makes this particularly useful for mathematics, statistics and other number-crunching researchers and lecturers needing a way to add interactivity to their work. Interactive learning modules can quickly be enhanced with robust graphing, giving students immediate access to robust mathematics visualisation.

For more information, see www.wolfram.com/products/webmathematica or contact Analytica International on (0403) 049 453 or www.analytica.com.au; AddSoft on 1800 233 738 or www.addsoft.com.au; or Hearne Scientific Software on (03) 9602 5508 or www.hearne.com.au.

Editorial

FROM THE EDITOR'S DESK



It seems like not too long ago that *Wheels* was heralding the introduction of Mac OS X and all the benefits it promised for the academic community.

These days, there are few sites that have not made the switch to Mac OS X. Academic adoption of the operating system – which is soon to get yet another shot in the arm with the release of ‘Tiger’ version 10.4 – has been an encouraging sign of its robustness, particularly in meeting the demands of researchers and developers.

In this issue, we highlight several Mac OS X success stories that showcase the broad range of applications it can be put to. At Swinburne University of Technology, for example, Mac OS X’s Unix ties and powerful visualisation capabilities have helped it secure a spot alongside Linux as an alternative Unix-derived desktop for scientists that require cutting-edge technology.

Up on the sunny Gold Coast, Griffith’s Tait Sanders has found Mac OS X to be a robust platform in configuring a QuickTime streaming media server for heavy use within the university’s School of Arts. We also talk to Robert Stainsby, a career

statistician who’s shifted streams to pursue a programming career after being exposed to the joys of Mac OS X.

In this issue, we also head to distant points in and out of Australia. In the Northern Territory communities of Wadeye and Belyuen, Apple iMacs and iTunes music libraries are helping locals revisit their musical heritage. We then head west to Singapore, where a cluster of iMacs is changing the way English teachers are learning to teach their own students.

For those of you interested in recent technologies, I might take this opportunity to point you to our story about Marratech, online group collaboration software that’s taking iChat to a whole new level. The AUC is offering AUC members access to an evaluation copy of this powerful software, and I encourage anyone interested to check it out.

As always, we are keen to hear about your own experiences with Mac OS X or any other Apple-related technologies within your university setting. Tell me about it at pjsharpe@unimelb.edu.au.

Peter Sharpe
Editor, *Wheels for the Mind*

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Cover photograph: Wurlthirri ceremony at Wadeye, May 1997. Elizabeth Mark Crocombe.



X World II turnout reveals Mac OS X enthusiasm

In July 2003, the Apple University Consortium held its first event aimed specifically aimed at University staff that support, maintain or administer Macintosh computers. X World I was a great success, running over two days to provide updates from Apple's WorldWide Developers Conference as well as workshops offering hands-on training and examples in configuring and setting up Mac OS X solutions.

Building on the success of the first X World, the AUC, in conjunction with Apple Computer Australia, hosted a follow-up - X World II - this past July. The three day, hands-on training event continued to build on the success of the last event, and featured a wide range of presenters from the University sector.

There were also a broad range of hands-on laboratories helping attendees learn how to configure and administer Mac OS X, and implement it back in their own environments. Workshops covered topics such as UNIX Tools, CUPS & Print Management, AppleScript for

Administrators, Directory Integration, Lab Maintenance & Imaging Machines and Understanding Samba.

One of the highlights was a keynote presentation from Dr Kevin Shinpaugh from Virginia Tech University, who outlined how they went about designing and constructing System X. This supercomputer was built using a hundreds of PowerMac G5 in a computing cluster; after three months of construction, the system went live and enjoyed brief stint as the third fastest computer in the world (VT was not on the latest Top 500 list because of some ongoing hardware upgrades).

Other keynotes included an update from WWDC, and a discussion of how Apple is using its own technology in running its business.

At the conclusion of a very enjoyable event, attendees joined for a social dinner where plentiful food and drinks joined ample networking opportunities. The event was considered an all-round success, and plans are already underway for X World III.

CELEBRATING 20 YEARS OF AUC

This year marks two decades since the AUC began operating within Australia and New Zealand, and it's been a long and exciting trip. The majority of universities within the two countries are now members, and a growing range of activities continues to support the role of Apple technologies within tertiary and postgraduate education.

To mark this notable occasion, the AUC will be hosting a celebration dinner on October 29, as part of the AUC Annual General Meeting. At the dinner, attendees will be joined by Professor Lawrence Lessig, a distinguished Stanford Law School professor who is a board member of cyber-rights watchdog the Electronic Frontier Foundation.

A specialist in areas of constitutional law, contracts, comparative constitutional law and cyberspace related issues, Lessig founded Stanford Law School's Center for Internet and Society. He has authored several books including *Code and Other Laws of Cyberspace*, *The Future of Ideas*, and *Free Culture: How Big Media Uses Technology and the Law To Lock Down Culture and Control Creativity*. He was recently named one of the Top 50 Visionaries by *Scientific American* magazine.

Professor Lessig is no stranger to Australia, having recently appeared in front of the Senate to participate in the debate about the role of open source in government. His broad background and outspoken advocacy of creative rights will make him an appropriate and fascinating dinner guest as the AUC rolls into its 21st year of operation.

Registration forms for this black-tie event will be sent out to AUC and AUDF contacts very shortly. Invitations will also be sent to each University's Vice-Chancellor, IT Director and Deans of Law (or equivalents).



IT visionary Lawrence Lessig will attend a dinner celebrating 20 years of the AUC on October 29

MARRATECH *Delivers* the virtual meeting room

Collaborative software has come a long way in the past few years, and the increasing use of Instant Messaging – whether it be AOL instant Messenger, Yahoo! Messenger or Apple's own iChat has created an increased need for real-time communication.

When Apple released iChatAV in the middle of 2003 with Mac OS X 10.3, the Mac community immediately embraced it. Add the more recently released iSight camera, and you had your own one-to-one videoconferencing station. Despite these advancements, however, the need for 'one-to-many' or 'many-to-many' communication was still out of reach.

Just after the release of iChatAV, a small Swedish company announced they were releasing a Mac OS X client for their e-Meetings software. With the interest high, Marratech AB released their client software for Mac OS X. It included a number of enhanced features that allowed users to not only communicate, but also to collaborate on documents and share workflows.

The Apple University Consortium was in the process of investigating collaborative software when Marratech came to our attention. The AUC news Xserve was set up with a trial license and started experimenting with the use of online collaborative software. The goal of the project was to ultimately assist universities in exploring the uses of such technology for teaching, learning and research.

What are E-Meetings?

The Marratech Work Environment helps groups of people to communicate, collaborate and manage information from their computers. It gives users a secure environment where members



can talk with high voice quality, share information, pictures, MS Office documents and see each other.

The interface is easy to use but has a lot of features in a recently updated version including live document sharing allowing workgroups to instantly provide feedback on documents, spreadsheets, presentations and any other document that is displayed on the screen.

There are some great examples of how the technology can be used in teaching, learning and research environments. For example, it would become relatively straightforward to extend your classroom over the Internet by having students join an electronic collaboration space. Before the class begins, you would import your slides from PowerPoint and other material in the classroom's electronic whiteboard. When the class begins, all the students will have the material pre-loaded into their client software; changing slides will take a fraction of a second.

This environment makes for truly interactive e-learning, where distributed students can ask questions using

high quality voice or text and use the whiteboard to solve problems.

Marratech also allows the recording of voice, whiteboard, chat, slides and video. All can help students review the lecture afterwards, making this a very popular functionality before final exams!

To encourage adoption of this important collaborative technology, the AUC is providing AUC members and others in the education community a copy of the Marratech client software, as well as access to the server for hosting meetings and presentations. Use is restricted to exploration and evaluation purposes only, and each AUC member University has been allocated a number of logons to use.

You can find more information about Marratech, download the client software and get set up at <http://auc.uow.edu.au/training/marratech>.



MARRATECH

e-meetings - business in sight



Inaugural awards recognise AUC talent

For years, the AUC has spent most of its money on training, conferences and grant programs.

We'll keep doing that, but in this – the 20th anniversary of the AUC's founding – we have done something different by launching our own Best Practice Awards. These awards were presented at a dinner at Darling Harbour's IMAX cinema, held after the very successful X World II conference in July. Myself and Rob Osborn of Edith Cowan University – who is also chair of the Apple University Development Fund committee – presented the awards.

Our regular training and grant programs reflect our core goal of investing in people and hoping for good things to come, but the Best Practice Awards recognise people who have already delivered good things. Even more importantly, they acknowledge the efforts of those people who have shared their knowledge and results with the broader AUC community, encouraging widespread adoption of better learning technologies and best practices.

It's all about shared resources providing shared benefits. We're proud of the award winners and of their work, and we're delighted to recognise them. Each winner receives a PowerBook, a plaque, and a \$1000 prize.

...And the winners are:

The Pursuit of Knowledge Award

Paul Bourke, of the Centre for Astrophysics and Supercomputing, Swinburne University, for his work in identifying cost-effective, platform-independent solutions that enhance the field of scientific visualisation.

Honourable Mention: Ric Lowe, of the Department of Education at

Curtin University of Technology, for use of Apple technology to research the way learners interact with educational animations.

Excellence in Academic Support (two winners)

1. John Tucker, of the Australian National University, for a superbly prepared nomination by Greg Preston that cited John's sustained excellence in supporting academic use of Macintosh at ANU, culminating in a successful deployment of Mac OS X in 2003.

2. Steve Doyle, of Edith Cowan University's School of Communications and Multimedia, for showing consistent leadership, innovation and creativity in deploying what is considered to be a 'Lighthouse Site' for Apple technology.

Student Achievement Award

Heath Raftery of the University of Newcastle, for Authoxy, a proxy authentication solution that met a conspicuous need for Australian university students. It's a \$5 piece of shareware, and it's been used and commended around the world!

Honourable Mention: Mohammad Tabbarra of the University of Melbourne. Mohammad's work developing a cutting-edge video compression algorithm received an AUC grant and has been wildly successful so far.

It's always enthralling to catch up with the many innovative developments underway at AUC member institutions. We at the AUC will aim to make the Best Practice Awards a regular event, and will be calling for more nominations later this year. Drop by the AUC Web site, <http://auc.uow.edu.au>, to find out more about submitting your own nominations.



RESERVING OUR MUSICAL HERITAGE

Broad cultural diversity within Australia's Aboriginal population has seen the flourishing of hundreds of different languages and dialects.

Each of these has its own rich body of folklore and music. But what happens to these traditions when the languages stop being used?

For years, this very question – and her acquaintance with songs in languages still spoken by just three or four people – has driven Linda Barwick, a senior research fellow in the Department of Music at the University of Sydney, to work with communities and fellow linguists and musicologists to preserve the music and language of the Aboriginal communities she has spent years studying.

A musicologist by training, Barwick and partner Allan Marett, a professor of musicology at the University of Sydney, have spent years combing through archives of Aboriginal music, and making their own recordings of singers within the Aboriginal communities they have visited. These communities include Wadeye, a town of 2000 people about six hours' drive southwest of Darwin, and Belyuen, a 300-strong community on the Cox Peninsula on the other side of Darwin Harbour.

Having spent years methodically scouring archives at institutions such as the Australian Institute of Aboriginal and Torres Strait Islander Studies and University of Sydney Archives, Barwick and her associates have helped to repatriate archival recordings to their home communities. Some communities, like Wadeye, have made a concerted effort over the years to build up their own local collections of sound recordings. The Wadeye Aboriginal Sound Archive now hosts over 500 hours of sound recordings of stories and songs in the numerous local languages.

Those recordings, made over the past 51 years, include a broad variety of performers including Wangga singers Thomas Kunging and Maurice Ngulkur; Lirrga singers and composers Pius Luckan and Clement Tchiburur; Thanpa singers Harry Luke Kolumboort, Lawrence Kolumboort, Felix

Bunduck and Elizabeth Cumaiyi; and popular local bands including the Nangu Band and Emu Sisters.

In the past, Barwick's recordings were made on Digital Audio Tape, then transferred to conventional cassette tapes, which the researchers left with the Northern Territory communities they'd been visiting after their departure.

With the advent of Apple iTunes, however, the historical archives of community music and language have become far more accessible. By transferring the recordings to Apple eMacs running iTunes, Barwick and her fellow researchers have been able to make the complete range of recordings available to people in the communities where they were recorded. iTunes' metadata capabilities have allowed the researchers to enter a variety of information about each track, allowing interested parties to retrieve music by artist, language, and several other methods.

The eMacs, which are located at the Wadeye Knowledge Centre and smaller Belyuen Bangany Wangga digital workstation, store the local recordings on external 512GB and 80GB hard drives, respectively. Music is stored in uncompressed quality to ensure that locals, who are welcome to make their own playlists and CDs of the music, have access to archival-quality recordings.

"We used to provide cassettes with songs on them when we visited, but now we can provide a resource that means people can choose whatever they want, whenever they want," says Barwick. "There's a dynamic relationship between recordings and performances in those communities, and everybody would be interested in something different."

Sometimes, music lost for a generation re-emerges: Barwick recalls the launch of the Belyuen database, where one local singer, reminded of an old song by hearing – via iTunes – a long-lost recording of his grandfather, performed the same song live later that day at the launch ceremony.

With more than 1000 songs now archived at the Wadeye Knowledge Centre and around 480 Wangga songs on the Belyuen database, the project – which has been funded by the Northern Territory Library and Information Service and the Australian Research Council – has created new ways of accessing the region's musical and linguistic heritage.

The success of the project has fed into new, related projects. For example, local elders at Wadeye, working with researchers Lysbeth Ford and Maree Klesch of the Batchelor Institute of Indigenous Tertiary Education, are compiling a multimedia Marri languages dictionary. And Barwick, Marett and Ford, with Michael Walsh and Joe Blythe of Sydney University and Nicholas Reid of the University of New England have just begun a collaborative project at Wadeye to study Thanpa songs composed in the local Murrinh-patha language.

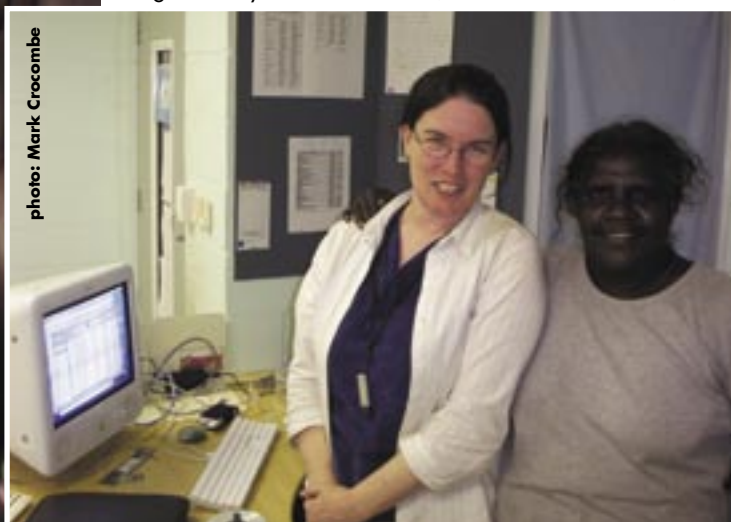


photo: Mark Crocombe

Dr Linda Barwick (University of Sydney Music Department) and Ms Bernadine Kungul (Wadeye Knowledge Centre) celebrate loading the one-thousandth locally-recorded song on the Wadeye Knowledge Centre's iTunes database, November 2003.

Scientific visualisation involves the presentation of datasets in such a way as to provide additional insight into the underlying science that produced that data. Aspects of data can be mapped onto any of the human senses, but the most receptive is our visual system thanks to the powerful depth perception we experience through stereopsis.

Visualisation software has some highly desirable characteristics and some very unique requirements. At the Centre for Astrophysics and Supercomputing at Swinburne University of Technology, Apple hardware running the Mac OS X operating system is helping us meet those requirements.

Many of those requirements grew out of the Unix platforms used for visualisation in the past. For example, the sharing of source code written by collaborators and other researchers is an important aspect of scientific computing in general. There is the expectation that this source code can be compiled on the particular computer system owned by the research institution, irrespective of where it was written. This issue is even more difficult for applications that use media rich information, such as audio, and rely on graphical user interfaces.

While specific tools and conventions support this activity on a Unix platform, it has been significantly more difficult on Microsoft Windows platforms and the pre-Mac OS X Apple Macintosh. This issue is alleviated on most UNIX platforms through a large collection of cross platform libraries and because of the X-Windows windowing environment. X-Windows is uniformly supported on UNIX based systems and, thanks to Mac OS X's Unix roots, on that platform as well.

Graphics are another area where Mac OS X has proved worthy. Visualisation applications generally deal with large volumes of multidimensional data, and real time performance (at least 25 frames per second) is critical to being able to effectively interact with these datasets. This generally requires hardware assisted 3D graphics in the form of OpenGL compliant graphics cards. The standard support across the whole Macintosh range for OpenGL graphics, including uniform driver support, further ensures that such applications have a better chance of performing adequately across the various vendor hardware options.

Most high performance computing resources, whether based upon clusters or not, are running the Unix operating system. This means there are significant advantages for researchers to also be using Unix as their desktop operating system. The Centre manages a large cluster of Linux based machines, and staff within the Centre have a mixture of either Linux or Mac OS X desktop computers. All of the visualisation tools the Centre has developed locally can be compiled for both platforms, a significant efficiency given the time consuming nature of software development.

Many visualisation problems can benefit from stereoscopic projection, that is, the independent presentation of images from a left and right eye perspective to the corresponding human eye. This gives a strong sense of depth that assists in the understanding of three-dimensional relationships in a way that cannot be obtained with a single perspective view.

The Centre has a long history of using stereoscopic techniques, and the vast majority of the visualisation software developed locally can operate in that mode on any Macintosh equipped with a dual display graphics card. These applications can be employed to explore data in stereo3D in our stereoscopic enabled lecture theatre driven by a high end G5 tower. Thanks to Mac OS X, the same applications run on the midrange machines staff may have on their desktops, and on laptops when researchers are presenting their work externally.

Mac OS X's suitability as a platform on which to conduct scientific research is seeing it become the platform of choice in many science disciplines, including those that rely heavily upon visualisation. This is in addition to Mac OS X's other advantages, such as providing a single solution for commercial applications as well as research based software.

With regard to visualisation applications, there are still some challenges for Apple - in particular, support for more powerful graphics cards. The current highest end support is for the Radeon cards, which are in the middle of the overall performance range. There are, additionally, some unexpected differences between the X11 and OpenGL implementations on Mac OS X compared to other UNIX platforms. It is expected that the suitability of the Mac OS X platform for visualisation and scientific research will improve as Apple continues to pursue the high performance market in the future.



TAKING TEMPERATURE TO NEW HIGHS

“There’s quite a lot happening around the Mac in terms of building things that work with the Internet”



WWDC 2003 reinforced ex-statistician Robert Stainsby’s decision that it was time for a career change.

Robert Stainsby got his first taste of Mac OS X when his partner brought an iMac home several years ago.

Previously an RMIT University statistician with an interest in programming, Stainsby began experimenting with the system and doing Cocoa and other tutorials through O’Reilly Media’s online Learning Lab (<http://learninglab.oreilly.com/>). A longtime Unix user, Stainsby quickly fell in love with Mac OS X and decided to pursue a career change and become a programmer.

“I decided that if I liked it so much, why not do it for a job?” he recalls.

Chasing this dream, Stainsby enrolled in a Graduate Diploma in Software Development but has suspended the course to spend a year in Canberra working in a programming position within a government department. There, his work focuses on Windows and Unix, which he sees as “particularly clunky – very much a back-end at work with Windows front ends. They’re missing the neat little tricks you’ve got in Mac OS X, like recalling what you just typed, consistent keyboard shortcuts, or dragging filenames into the command line.”

Stainsby plans to resume the degree next year, but in the meantime has been working hard to polish up his Mac OS X skills.

The first deliverable from his efforts is Degrees Down Under, a weather monitoring program that automatically downloads current weather conditions and forecasts from the Bureau of Meteorology Web site (www.bom.gov.au) and displays them on the Mac OS X desktop.

Since the BoM doesn’t provide weather data in XML streams, Stainsby’s program works through ‘screen scraping’ – loading relevant Web pages, then searching for and downloading the information. Users can choose which weather stations they’d like to monitor, with current conditions displayed on the desktop or in the Mac OS X application dock. Temperatures are displayed in different colours to indicate general conditions with a glance.

A number of similar applications exist, but their focus on American users left a hole that Stainsby believes can be filled by localised applications designed by and for Australians.

Delivering a complete application was intellectually invigorating for Stainsby, whose enthusiasm for the Mac OS X platform has continued to grow since he funded a trip to Apple’s 2003 WorldWide Developers Conference in California (an Apple scholarship paid his registration fee).

There, Stainsby was taken by the strong community feel of the developers, and took advantage of the opportunity to review Degrees Down Under’s design with an available Apple software expert. Educational seminars on Cocoa and related topics expanded his capabilities and redoubled his determination to continue building experience in the Mac OS X world.

“There’s quite a lot happening around the Mac in terms of building things that work with the Internet,” Stainsby says. “One of the best things about WWDC was meeting some of the people who had developed apps that I use and realising that they’re just like me. It was money well spent.”



STILL THINKING DIFFERENT: APPLE TECH UPDATE

Apple has always been about thinking different, and this year its team of propellerheads have been in top gear delivering new technologies to improve the capabilities at your fingertips. From another significant upgrade to Mac OS X to new multimedia applications and some enterprise-class computing technologies, Apple's releases for the first half of 2004 have been a real grab-bag of goodies. David Braue highlights a few of the standouts.

Hear the Tiger's roar

Mac OS X continues to revolutionise the Macintosh computing experience. With each successive upgrade, new features provide increasingly powerful tools, and the next iteration – 'Tiger', version 10.4 – is no exception.

Due to ship in the first half of 2005, Tiger was first revealed to an enthusiastic crowd by Steve Jobs at WWDC 2004 in June. It will include more than 150 new features, ranging from small enhancements to major new productivity tools.

Spotlight, for example, will provide pervasive searching capabilities across the entire Mac OS X environment. It automatically catalogues iTunes songs by artist, album and name, and maintains a running index of documents, appointments, emails, presentations, and images. The goal is to make sure content is no longer lost on users' hard drives; this dream becomes

reality by combining Spotlight's robust content indexing capabilities with Smart Folders in Finder, Smart Mailboxes in Mail, and Smart Groups in Address Book.

Another key enhancement is Safari 2.0, an upgraded version of Safari that weighs in with support for the RSS (Rich Site Summary) news syndication standard that's quickly become common across many content-generating sites. Safari 2.0 automatically discovers RSS feeds and launches an RSS browser to enable seamless reading of syndicated content. Safari 2.0 also includes a Start Private Browsing feature, in which the browser forgets all the information you enter during a session.

Tiger's user interface is getting a few more tweaks, as well. The new Dashboard layer hides small 'widgets' with momentary uses – for example, the calculator, clock, calendar, live Webcams and games – in an Exposé style layer that zooms into view with a single keypress. Dashboard modules are essentially floating Safari windows that can be designed with HTML, CSS, JavaScript or any other Web-compatible technology.

Other features keep Mac OS X at the forefront of user interface design. There's the Automator feature, which simplifies the creation of scripts for repetitive actions. Support for the MPEG-4 H.264 video compression codec, recently ratified as the standard for High Definition video discs, will keep QuickTime current, while new Core Image and Core Video features

provide new capabilities for visual content manipulation. There's a completely new .MAC Sync feature, support for 64-bit processes and improved scalability, better integration with Microsoft Active Directory, and Xcode 2, the latest version of Apple's suite of developer tools.

Plug it in and play

The success of AirPort has made wireless LAN connectivity a standard feature across new Mac systems, and this year Apple has taken the concept a step further with the launch of AirPort Express.

Designed for mobility, AirPort Express is a full 802.11g-compliant WLAN base station that plugs straight into a power point, allowing Mac or PC users to share a DSL or cable connection with up to 10 users. AirPort Express also includes USB printer sharing, and support for security standards such as WiFi Protected Access (WPA). All this is tucked into a palm-sized device designed for the road.

A stunning exercise in miniaturisation becomes even more interesting, however, when the AirPort Express is paired with iTunes 4.6. AirPort Express also includes a hybrid analogue-digital audio port that allows it to be connected to hi-fi stereo systems. iTunes automatically recognises the additional speakers, allowing you to seamlessly stream your music collection throughout the house using the AirPort Express.

AirPort Express is also being lauded for one extra feature – its ability to act as a WLAN repeater. This lets it extend the range of a WLAN by receiving, amplifying and retransmitting signals from nearby base stations. This capability is essential for blanketing areas of classrooms, homes and other spaces with seamless and high-performance WLAN coverage.

Remote control gets better

As populations of Macs continue to grow in many AUC member universities, lab administrators are warming to the benefits of centralised desktop management.

Using this approach, it's simple to reinstall operating system and application images, inventory hardware and software on remote systems, track configuration changes, and more. Long established in the Windows market for PC-heavy enterprises, Apple recently brought such capabilities to the Mac OS X world with the launch of Apple Remote Desktop suite of management tools.

Remote Desktop Version 2, released in June, adds more than 50 new features to further improve management of Mac OS X systems. Important new capabilities for example, task lists track running, queued and completed tasks, which can be saved and rerun later with new parameters. Remote shell scripts allow the running of Unix scripts or commands simultaneously on multiple Mac OS X systems, while the Remote Control feature allows execution of Mac OS X functions on multiple machines simultaneously.

Network Scanners allow administrators to quickly find networked computers using Rendezvous, while a new User Access Mode allows administrators to give specific users the ability to run a subset of Remote Desktop commands. Remote Boot Disk Selection complements Mac OS X Server's NetBoot and Network Installation features to allow specification of local startup disks or network startup disks.

Integrated support for the open source Virtual Network Computing (VNC) technology allows administrators to use Remote Desktop 2 to view and interact with any remote Mac, or VNC-enabled Windows or Linux systems, in real time. This capability is invaluable for help desks or training situations, where an instructor or technician can guide users through problem resolution.

Multimedia galore

Anybody using Apple technology knows its reputation in multimedia creation is unparalleled. This year, the company has raised the bar further with the release of a slew of new products and upgrades to its industry-leading multimedia tools.

One of the key new tools is Motion, an easy-to-use tool that enables animation of text, graphics and video according to natural 'behaviours' such as gravity and wind. Motion enables interaction between elements, including attraction and repulsion, and includes an advanced particle engine that creates ambient effects using built-in or user-defined elements.

DVD Studio Pro 3 is an upgrade to Apple's flagship DVD creation software. The new version includes enhancements such as a Graphical View providing storyboard viewing of all DVD elements; over 30 effects including movie-like Alpha Transitions and the ability to create new transitions using Motion or Adobe After Effects; Compressor 1.2 technology to enable direct HD to MPEG-2 compression; DTS 5.1 audio support; and other features that reinforce DVD Studio Pro's leadership in DVD design.

Shake 3.5 enhances Apple's compositing workbench with new shape-based warping and morphing tools, including 'shape shifting' effects based around industry standard spline tools. Other features include support for 16-bit and 10-bit QYUV QuickTime formats, an enhanced Shake Qmaster distributed rendering engine for splitting jobs across clusters of G5 servers or desktops, and the ability to specify whether each task renders at 8, 16 or 32-bit colour depth.

Final Cut Pro HD brings the widely popular Final Cut Pro into the High Definition realm, with the ability to capture HD streams over a single FireWire cable with no recompression or degradation. It incorporates support for up to four HD streams (or ten in preview quality), native DVCPRO HD formats, direct monitoring of SD and HD streams directly to an Apple Cinema Display, and output of SD or HD projects directly to MPEG-2, MPEG-4,



and QuickTime files. It also offers multi-track audio mixing and more than 150 filters, effects and transitions. The launch of Final Cut Pro HD was accompanied by announcement of a partnership between Apple and Panasonic, whose new AJ-HD1200A is the first HD production VTR to include a FireWire interface.

From R&D to you

The boffins in Apple's R&D laboratories aren't only occupied with creating great new gadgets and software; they're also contributing to the world of technology through the creation of innovative new technologies that improve Mac OS X's functionality in enterprise environments.

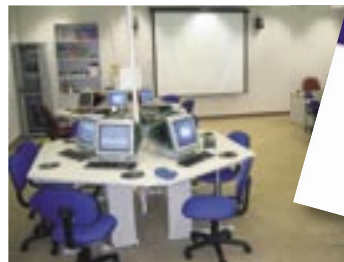
Xsan, a storage area network file system is one example. Designed to optimise delivery of streaming content and content, Xsan is a 64-bit cluster file system that provides multiple computers with concurrent file-level read/write access to shared volumes over Fibre Channel links. Using Xsan, up to 64 users can simultaneously access a single storage volume supporting multiple high-bandwidth video streams.

Building on the G5's success in high-performance computational environments, Apple has also released Xgrid, which coordinates computing resources to allow the clustering of up to 84 G5 processors into a 1.5 teraflop supercomputer. The Xgrid Console allows users to execute Unix commands, run shell scripts or feed applications across a cluster, while a software development kit facilitates the porting of custom applications to Xgrid.

It's been a busy year at Apple, and rest assured that the innovation will continue!



Teaching English, Singapore Style



Windows PCs might rule supreme in Singapore universities, but the decision to stock a new computer lab with Macs has paid off in ways that were never imagined when the decision to go with Apple systems was made.

That decision was always in the minds of Michael Vallance and Phillip Towndrow, lecturers in the English Language and Literature academic group of the National Institute of Education at Singapore's Nanyang Technological University.

Longtime Mac users, Vallance and Towndrow were aware of the platform's benefits in an educational setting. But in an environment where PCs were rapidly gaining currency, Macs were something of a revolutionary idea. Yet even with little support from the university's centralised IT support organisation, the team decided to follow their intuition.

The result: a lab of 34 iMacs, networked to a Mac OS X server, with four iMacs wirelessly networked using an Apple Airport base station. Four iBooks in an adjacent room are also wirelessly networked. Applications in use include iMovie and Inspiration's 'mind mapping' software.

Configuring the systems in the lab proved to be a smooth endeavour when it was originally set up in 2001 using Mac OS 9, but an upgrade to Mac OS X last year got technical staff to put on their thinking caps.

Technicians originally tried to install all applications on one hard drive and use it to clone the other 33, but this approach fell over when initially tried in Mac OS X. Also unsuccessful were attempts to clone the new systems from a disk image on the server. In the end, the upgrade was completed by creating a standard operating environment image on an external hard drive, then loading this onto each system in succession. Open-source printer and scanner drivers were sourced from the Internet.

Apple Remote Desktop is now used to manage all the iMacs through a graphical interface running on a teacher's G4 system. Because no file sharing was allowed using this technique – and teachers therefore couldn't broadcast documents to all of the iMacs – technicians developed a workaround that involved a commonly accessible drop-box where teachers could leave documents and students retrieved them.

Customisation of the Mac OS X environment has further strengthened the lab's utility as a 'digital classroom' that pro-

vides multimedia support for courses such as Using IT in the Language Classroom, an immersive course designed to guide final-year trainee teachers' development of English language teaching methods.

By giving teachers-in-training access to easy to use technology, the aim was to provide a tool that they would quickly learn to use and integrate into their own evolving teaching methods. Even the layout of the room was designed to encourage sharing: the iMacs are split between five learning 'islands', which unite students into working groups that Vallance says foster collaboration within the classroom environment.

By encouraging them to be creative with the computers, rather than simply delivering behaviourist learning aids such as worksheets and multiple choice lessons, Vallance feels the new environment has given teachers the power to direct their learning – and that of their students. "We decided not to go with that traditional computer-aided learning software from the 1990s," he explains. "We preferred constructivism, allowing us to adopt a student-centred learning approach."

For example, use of iMovie has allowed students to develop a broad range of multimedia presentations that help build essential communication skills. This helps them create and test hypotheses through an ongoing process of collaboration and presentation.

The use of Macs had another previously unanticipated effect: since very few students had experience on the Mac platform, all began the term starting at the same level. This presented an interesting complication given the cultural importance of 'face' in Singapore, which in the classroom suggests that teachers inherently know more than their students. But when it came to figuring out new ways to use the Macs, the students quickly roared ahead.

"Last semester, out of a class of 34 students only two had used a Mac before," says Vallance. "When they come into the Mac lab, it levels the playing field. By the end of the second week, it's just another computer to them. We had to tell the trainees not to be afraid of not being the experts in the technology; many are reluctant to take risks and to allow the kids to take risks. By coming into the Mac labs, we find it reduces the barriers to risks. In the end, those with good ideas tend to stand out more than those who are more computer literate."

Mac OS X: *Gently down the stream*



It's one thing to serve up static documents and simple applications to users, but another thing entirely to push out hundreds of simultaneous video streams to media students.

At Griffith University's Southport, Queensland campus, this challenge will be met using an Apple XServe that's been configured specifically to serve as a QuickTime video streaming server.

The new G4 XServe – with 1.33GHz CPUs, 1.25GB of RAM and two 55GB hard drives – is networked using Gigabit Ethernet and running Mac OS X 10.3.4. It replaces another G4 server that was not set up or specced to support QuickTime streaming. Unlike existing Linux and BSD servers running the Apache Web server and MySQL database, the XServe will be dedicated to delivering all sorts of multimedia Web content to support several interactive design classes within Griffith's School of Arts and Communications.

The content of those classes, which have names like Creative Arts, Communications, Cyber Art and Digital Video, is self explanatory. But with 300 students in the college and a potential audience of 1400 students on the Southport campus, traffic volumes could quickly grow. The server will house student Web sites as well as multimedia course content and working files such as those produced during student video production.

Tait Sanders, a computer support officer with Griffith business unit Elements IT Services who joined the 14-strong

team several months ago, had previously set up a similar system under Linux but was able to transfer his knowledge to Mac OS X with very little change.

"I prefer to work from the command line, and with OS X you go to the command line to configure many fields," he says. "It's a little more automated [than Linux] through the GUI, but I like the fact that you can fiddle around with OS X."

The system will be serving both static files from FTP and streaming files via HTTP. This will allow for delivery of student Web sites and provide a live conduit for delivery of multimedia content across the network. A purpose-built studio on the campus will provide a way for students to record video, which will be streamed through the XServe in real time and out to QuickTime clients. Other content will remain on the server and be dished up on demand.

Sanders has configured the free RSyncX utility to automatically mirror one hard drive onto the second, which is also bootable and able to take over as a Web/FTP/QuickTime streaming system if the first one encounters trouble. This redundancy, he hopes, will ensure the server remains up and accessible to the expected deluge of student projects when the system goes live in Semester Two.

"It will be interesting to see how it handles the overhead when it goes live, and how the other services hold up underneath it," he says.

Content Indexing, Mind Maps And Hyperlinks

The Digital Ceiling:

It isn't often that normal users of Macs discover a major bug. And by major bug I mean a deep, systematic, generic dysfunction – but there it was. The bug I found in an early version of OS X involved Content Indexing. This used to work under OS 9. For some reason (prototyping X? a debugging strategy that was never fixed?), earlier versions of OS X's Content Indexing apparently indexed only the first 2,000 words of a document.

And then it just stopped. It didn't report a premature halt. And you only found out about it when you searched for words that you knew were in the document, and discovered that Content Indexing couldn't locate them. You checked with an application like EasyFind, which roared through megabytes of text and faithfully reported their presence. You double-checked with Word. Everything was there. But after what looked like word position 2,000, indexing suddenly aborted in Content Indexing on any text, whatever the file type. Bug-shooting took me a week, and it's still not working properly in X.3.4.

This hole in OS X has been a major chasm in my ability to work with the world of Panthers. I am a linguist. My intellectual world is full of millions of words in tens of languages, in text files sometimes over 1 megaword. I need to track words through these gigabytes of text files and corpora. It is the occurrence, and the co-occurrence, of words and phrases that provide me with much of the material that I work on.

For instance, there are only four occurrences of the word 'yellow' in the King James Bible. I know this from ConcordePro and from EasyFind. Three of the four occurrences deal with hair, and are in one chapter of Leviticus – an important clustering amongst the 821,213 words total.

Going by the initial reports, Apple have made a major step forward in

content indexing with a new engine called Spotlight, which will be part of the X.4 release called Tiger. Spotlight not only indexes things and allows super-fast access to the data and sources; but it also allows you to work with fuzzy searches if you can't quite remember when you recorded a document, or the exact form of the words that it contains.

This is good news for a beleaguered linguist. But it should also make us all, linguists and others, pause and reflect. The effort and expense that Apple have put into Spotlight mirror the growing demands on professionals in all kinds of fields to have responsible, fast access to incrementally growing bodies of information. And this information is keyed on WORDS.

Say that we need to be able to find all the times in our 150MB+ of archived emails that we reminded student X of the need to track the latest literature in key journals. Or the last time that we received a notification of an expiring journal subscription. Or the variety of ways a student has used a particular word, which is a useful way of detecting plagiarism. I used this approach (without Content Indexing) recently on a student's essays when they suddenly showed a magnificent flowering of unexpected vocabulary.

Our mental work-maps are built not just on words, but also on links and hyperlinks of words, words in chains and associations. We spend an increasing amount of work trying to recover the initial keyword in a chain of hyperlinked associations. Or the middle term in a chain. We may remember that the word in question starts with "b-", or rhymes with "cat", or was somehow associated with a meeting which we were to have that afternoon but was then cancelled.

So long as our world is recorded in machine-readable format, Spotlight will certainly help us keep better track of our strings and chains of word-associations. The problem is that our word-worlds are growing in size and complexity. And as they grow, we depend more on the reliable functionality of engines like Spotlight.

Socrates once commented wryly that the invention of writing would spoil men's ability to think. It would, he claimed,

weaken men's memories. The technology of writing has spent over two millennia sorting out this particular mismatch.

We are now faced with another mismatch. We don't yet well understand the architecture or functionality of a world-word-map joined by keywords and associations and hyperlinks. We rely to a growing extent on software like Spotlight. And when those engines break, we have to work with other technologies, or with a de-technologised, non-digital desktop. Or our memories.

I find that I am increasingly adding fail-safe redundancies into my word-chains as I build them. I deliberately over-engineer them. I create small meta-lists of typical and potent links which I use often: associations between words and other words as I construct my research frameworks. So far the technology is – just – able to support a world where we are expected to be access masters of terabytes of text. But if the keyword happens to occur at position 2,001, the machine can halt. We hit the ceiling and stick.

In other words, we need new research on the human end of managing a word-indexed world, and on building robust word-chains. And on how to find the time to build sufficient redundancy into our networks of word associations.

Footlight, that's the name they've given to this new indexing engine. I must remember to cross-link it to Shakespeare – and sneakers.



By Roly Sussex, Professor of Applied Language Studies Department of French, German, Russian, Spanish and Applied Linguistics, School of Languages and Comparative Cultural Studies, University of Queensland

APPLE TECH TO GO

Got some training coming up? Need some extra machines, quick? Look no further: the AUC is now offering members free usage of our Classroom In A Box (CIAB), an innovative combination of technologies that will have your temporary classroom up and running in a matter of minutes.

The main component of CIAB is its 15 PowerBook G4 systems, each of which includes a 15" LCD screen, 1.25GHz G4 processor, 768MB RAM, 80GB hard drive, SuperDrive, Bluetooth and Airport Extreme wireless connectivity. Each system is loaded with Mac OS X 10.3.3 with the latest patches and updates; iLife 04 (including iTunes, iMovie, iPhoto, iDVD and GarageBand); the Xcode 1.1.1 Development Environment; and Graphic Converter 5.

Also bundled with the notebooks is related gear including an AirPort wireless base station, a pair of 8-outlet power boards, and all necessary cables and adapters. The kit may soon also feature a portable data projector. All equipment is contained within two specially designed carrying cases, each water and airtight, that can be couriered anywhere in Australia. An additional trainer machine is also available if necessary.

In short, the CIAB offers cutting-edge technology that's ready to go out of the box. The machines have already been put into action to support a number of recent AUC training courses, which have been popular amongst member universities but can be difficult to schedule because of the need to accommodate normal computer lab usage. CIAB, however, lets the trainers bring the systems they need with them – so all they need to run a course is a free room.



"Our main aim is to provide the technology that will run the training, conferences workshops and any other events requiring Apple technology," says AUC programs manager Andrew Jeffrey. "Some of the training courses being offered require two systems – for example, many Mac OS X courses require client and server machines – a lot of laboratories don't have two machines per person. We're offering Classroom In A Box to supplement them, and we would like to see AUC member universities finding new and innovative uses for the machines."

Better still, it's available free for the use of AUC member universities, who only need cover the cost of delivery from and back to Apple. Rentals of one to two weeks are envisaged, although the merits of specific applications will be assessed individually. Visit the AUC Web site, <http://auc.uow.edu.au>, for an application form and more information.

WANT TO SEE IT ON MAC OS X? TELL APPLE

Got a favourite application that's not available under Mac OS X? Tell Apple about it. Commercial or open source applications, popular or obscure, scientific or general purpose – whatever applications you want ported, Apple would like to know about. That includes apps written for OS 9 but not yet ported to Mac OS X.

Your input will guide future discussions with software authors in an effort designed to further expand the application base available to the academic and scientific community. Please visit <http://www.apple.com/science/applications/survey> to submit your requests.

SAGE-AU SCHOLARSHIPS ANNOUNCED

Annual AUC scholarships to Apple's WorldWide Developers Conference have been a big hit among members. This year, the AUC is expanding its conference support with the introduction of 14 national scholarships to the annual SAGE-AU (System Administrators Guide of Australia) conference.

To be held in Brisbane this year from August 16 to 20, the conference allows individuals to explore emerging technologies and the issues that confront people managing computer systems within organisational settings. Networking, skills workshops and formal training are all available in abundance for attendees.

Winners of the inaugural scholarships, which include conference registration and an allowance towards airfare and accommodation costs, are:

Ricky Chung - Charles Sturt University

Leon Czechowicz - Australian National University

Jonathon Davidson - University of Technology,
Sydney

Mark Dorset - University of Melbourne

Daniel Foster - University of Western Australia

Samia Ftouni - Swinburne University

Leslie George - University of Sydney

James Harris - University of Melbourne

Bryan Hellyer - University of Melbourne

Berry Mak - University of Technology, Sydney

Danielle Pullin - University of Melbourne

Junaid Qamar - Monash University

Tait Saunders - Griffith University

Greg Warner - University of South Australia



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