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INDIGENOUS STUDENTS ENGINEER THEIR FUTURES

In January this year the Faculty of Engineering and Information Technologies was proud to host the 15th annual Indigenous Australian Engineering Summer School (IAESS).

The event introduces Indigenous Year 11 and 12 students to engineering and the wide range of opportunities an engineering degree offers.

This year’s IAESS drew together 21 young Indigenous men and women from across Australia. The week kicked off with a Welcome to Country ceremony by Michael West from the Metropolitan Local Aboriginal Land Council.

Continued page 3
DEAN’S MESSAGE

This summer we hosted more than 100 talented young people from around Australia at our annual National Computer Science School (see page 4) and at the Indigenous Australian Engineering Summer School (see pages 1 and 3). These programs give high-school students in Years 11 and 12 an opportunity to visualise paths into careers in engineering and information technology.

Work on the refurbishment of the Peter Nicol Russell Building continues, with the major building works completed and the interior fit-out now in progress. Students will benefit from these new state-of-the-art IT-enabled teaching and learning facilities from March 2012. This project is part of a significant revitalisation of the engineering and IT precinct, which will also include upgrades of our laboratories, workshops and student areas.

In March this year we celebrated the official launch of the Institute of Biomedical Engineering and Technology. One of the first institutes in Australia to cover a broad range of medical technology–focused research and education, it will help to strengthen international recognition of Australian capability and knowledge in this increasingly important field. The institute brings together more than 35 researchers working across the faculty in the areas of biomechanics, biomaterials and tissue engineering, biotechnology and biomolecular engineering, biomedical devices, instrumentation, imaging, visualisation and information technologies.

I would like to welcome Dr Nick Cerneaz, (Rhodes Scholar and University of Sydney medallist in Mechanical Engineering) the new Executive Director of The Warren Centre for Advanced Engineering (see page 9). Dr Cerneaz (BSc 1988, BE (Mech) 1990) has significant industry experience in developing and commercialising medical software and devices, as well as an impressive academic background.

Finally, I am pleased to announce that David Stewart has accepted the position of Chairman of Engineering Sydney. David is an alumnus of the faculty (BSc 1974, BE (Civil) 1976) and brings substantial experience including as CEO of Leighton Holdings, that I am sure will further broaden and enhance our engagement with industry.

PROFESSOR ARCHIE JOHNSTON
DEAN

CONTACT US

If you would like to provide feedback or you have any ideas or suggestions for a story for our newsletter please contact us.

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Participants took part in a number of engineering activities to give them a feel for what engineers do and what study is required to be an engineer. Activities included a ‘float my boat’ contest, operating remote-controlled robots, riding a flight simulator and conducting a railway signalling exercise. The program also included site visits to the ABC, Qantas, the RTA, Leighton Holdings and the Navy’s fleet base at Garden Island.

During their stay participants also took in some of the city’s attractions, scaling the Sydney Harbour Bridge and catching a ferry across Sydney Harbour. The week culminated with the IAESS graduation ceremony at Government House, hosted by Her Excellency Professor Marie Bashir AC CVO and attended by The Hon Bob Hawke AC, patron of the IAESS. During the ceremony Professor Archie Johnston, Dean of the faculty, congratulated participants on completing the program and said they had inspired the staff and students who met them.

Established in 1998 by Engineering Aid Australia, the IAESS runs in January each year. Australian universities with engineering faculties share the hosting role, with the University of Sydney proud to be hosting the event again in 2013.
This year’s National Computer Science School (NCSS) brought together more than 80 of Australia’s brightest young minds for 10 days of intensive computer programming, robotics and web development.

From 7 to 16 January this year, participants learnt and refined programming skills, interacted with cutting-edge technologies and met other like-minded students from across Australia.

Participants were split into two programming streams – Python and Embedded – with each stream attending lectures and undertaking lab work and a major project.

Those in the Python stream honed their web development skills by creating new social networking websites. Small groups within the stream developed an idea of their own for a site with a particular focus, ranging from organising events and sharing event-based photos to engaging school students with reading and even having a good old satisfying argument online.

The Embedded stream’s project involved programming a Roomba robot for a rescue mission. Participants worked with NICTA ed1 boards to build, program, debug and decorate their robot, using light sensors, an accelerometer, an LCD display and a buzzer, programming victory songs and dance numbers into their successful rescue routine.

Participants were also given insight into their future careers, attending mock interviews with industry mentors and presenting an ‘elevator pitch’ to a panel of technology entrepreneurs. The industry representatives involved were impressed with the tech-savvy students. Alumnus Matt Barrie, CEO of Freelancer.com, said he was ‘continually blown away by the quality of students at NCSS’.

But NCSS is more than just lectures and lab time. This year’s participants also took part in a scavenger hunt and a trivia night, as well as having plenty of opportunities to stretch their newly honed coding skills with more academic endeavours. A cryptography challenge tested their code-breaking skills, and a programming competition saw them team up with industry mentors and Sydney alumni.

The program also included site visits to Macquarie Group, Atlassian and Google, giving participants a first-hand glimpse of what working in the IT industry really entails – pool tables, nerf guns, portals and free ice-cream included. Inspired by talks from Australian IT gurus, participants returned to the labs excited not just about their projects but also about the IT industry, its opportunities within Australia and especially forging their own place within it.

NCSS is run by Associate Professor James Curran and Dr Tara Murphy from the School of Information Technologies. They work with a team of volunteer lecturers and tutors, including Associate Professor Bob Kummerfeld, Associate Professor Michael Charleston, Dr Uwe Röhm and many students and alumni. The embedded stream is made possible through collaboration with Dr John Judge and NICTA.

NCSS would not be possible without the generous support of major industry and government sponsors, including gold sponsors Google, WiseTech Global, Freelancer and NSW Trade and Investment, and silver sponsors Atlassian, Macquarie Group and the Defence Signals Directorate.
ON SHOW: CUTTING EDGE RESEARCH

In October 2011 the faculty showcased the high-calibre research projects being undertaken by undergraduates and postgraduate students at its annual Research Conversazione.

The event focuses particularly on innovative, applied research that responds to national and international needs.

The 2011 Conversazione was well supported, with representatives from a wide cross-section of industry, government and alumni attending a networking function at the Seymour Centre before viewing more than 200 research projects from across all schools. Research Conversazione 2012 will be held on Friday 2 November 2012.

Sir David Higgins was named the faculty’s Alumnus of the Year 2011 at the Research Conversazione event. This honour follows his recent knighthood in the Queen’s Birthday 2011 Honours. Both awards are a tribute to his contribution to the London 2012 Olympic Games as chief executive of its Olympic Delivery Authority. He is credited with having ensured that the project was delivered on time and under budget with a strong focus on sustainability. Sir David is now Chief Executive of Network Rail in the UK.

ALUMNUS OF THE YEAR 2011
School of Aeromechanical, Mechanical and Mechatronic Engineering (AMME) head Professor Steven Armfield hosted an annual reunion dinner for graduates on 28 October 2011 at St Andrew’s College.

The reunion was for graduates whose final year of study ended in the number ‘1’ or ‘6’. A lively crowd of more than 70 alumni and staff representing graduating years from 1951 to 2001 attended an enjoyable evening, with some travelling from interstate or overseas to attend.

Our thanks to ‘class champions’ Peter Benyon, Briony Cadwallader, Richard Duggan, Phil Marsden-Jones, Shar Subbiah, Professor Salah Sukkarieh and Bill ‘Trick’ Wright.

An AMME reunion for graduates whose final year ended in the number ‘2’ or ‘7’ will be held in October 2012. If you can assist us in locating members of your graduating year, please contact Karen Worsfold on phone +61 2 9036 9760 or email karen.worsfold@sydney.edu.au.

GO GREEN!

To reduce our impact on the environment – as well as the costs of printing and postage – we are asking readers to consider receiving your Engineering Sydney newsletter online. To subscribe to the online edition, please visit sydney.edu.au/alumni and follow the links.
CLASS OF 1990 CHEMICAL ENGINEERING ALUMNI REUNION

The chemical engineering class of 1990 gathered for a fun and informal reunion at the Duck Inn in Chippendale on 15 October 2011. Thirty graduates travelled from as far as interstate and regional NSW to attend the reunion. We thank organisers Phil Plat and Andrew Lock for their indefatigable efforts in locating fellow graduates and organising the event.

CHEMICAL ENGINEERING WINE AND CHEESE TASTING

The School of Chemical and Biomolecular Engineering held a wine and cheese tasting evening for graduates on 14 October 2011. About 30 graduates braved a wet and wintry evening to gather in the Chemical Engineering Common Room and participate in the event led by alumnus Julian Todd. The evening was a chance to catch up and reminisce while learning about wine in a fun and informal setting.

Due to popular demand we will be restaging the wine and cheese night on 20 April 2012.

The cost is $30 per head and bookings are essential. T +61 2 9036 9760.

SCHOOL OF INFORMATION TECHNOLOGIES ALUMNI EVENTS

The School of Information Technologies (SoIT) and the University of Sydney IT Alumni Association (USITAA) hosted a lecture for students and graduates by alumnus Phil Diacono, now a performance engineer with Hewlett-Packard, on 20 October 2011.

Drawing on examples from his 30-year career in the industry, Phil generously shared his experience of performance pitfalls and successes. Guests had the opportunity to mingle over drinks and canapes after the lecture.

On 24 November 2011 more than 100 staff, students and alumni gathered for the annual SoIT end-of-year barbecue and prize-giving ceremony.

To stay in touch with all events and programs for IT graduates, join the USITAA group on LinkedIn.

PROJECT MANAGEMENT NETWORKING EVENT

The inaugural project management networking event was hosted by Professor Liaquat Hossain at The Arthouse Hotel on 23 November 2011. Around 40 graduates and staff spent an enjoyable evening mingling over canapes and cocktails. The new University of Sydney Project Management LinkedIn group was also launched on the night, with enthusiastic support from graduates.

Further events are now being planned for project management graduates in 2012, so please join the University of Sydney Project Management LinkedIn group to be kept up to date with the latest news.

For assistance organising a reunion contact:
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BIOMETICAL INNOVATOR WINS DAVID DEWHURST AWARD

Alumnus Dr Graham Grant was awarded Engineering Australia’s College of Biomedical Engineers David Dewhurst Award 2011 at a ceremony on 14 December 2011.

The award recognises the significant contributions made by Dr Grant to biomedical engineering and medicine through innovations in safer anaesthesia delivery, ventilation and humidification technologies.

Dr Grant was born in North Sydney in 1933, the son of a civil engineer. He graduated from the University of Sydney with a Bachelor of Engineering in mechanical and electrical engineering in 1957 with a thesis titled ‘Medical apparatus’. With an interest in biomedical engineering, he worked in industry in Australia and the UK for four years, developing and designing various items of medical equipment. At the time there were no specific courses in biomedical engineering, so in 1961, in order to broaden his knowledge and understanding of clinical medicine, he enrolled to study medicine at the University of London, graduating with an MBBS in 1967. He later undertook three years of training in anaesthesics and subsequently practised as an anaesthetist, but continued to develop items of medical equipment.

Among Dr Grant’s most significant designs are an improved portable incubator for premature babies, a safer humidifier for use in intensive care and anaesthesia, a paediatric ventilator, a portable anaesthesia ventilator and a new laryngoscope.

In 2007 he was elected a Fellow Chartered Professional Engineer of Engineers Australia in the Biomedical College. He is now retired from clinical practice.

At the award ceremony Dr Grant gave a presentation about the equipment he had developed, and discussed the difficulties that some clinicians have in providing clear specifications for equipment required, as they do not all have a clear understanding of the limitations or accuracy of various types of apparatus. At the same time, he said, some engineering designs are not satisfactory from a clinical user’s point of view. Dr Grant called for greater recognition of the status of biomedical engineers, given the broad area of knowledge they are required to possess, and for this to be reflected in adequate remuneration and the provision of time for creative work in positions of employment.
NEW EXECUTIVE DIRECTOR FOR WARREN CENTRE

The Warren Centre for Advanced Engineering welcomes Dr Nick Cerneaz, who commenced as executive director in February 2012.

From Rhodes scholar to leader of specialist technology companies, Dr Cerneaz has always been a high achiever. His academic qualifications include a doctorate from Oxford University as well as bachelor’s degrees in engineering and science from the University of Sydney.

A successful business leader, until 2011 Dr Cerneaz was CEO of Seeing Machines, a computer vision technology company offering a suite of products based on automated real-time tracking of human heads, facial features and eye gaze direction. He successfully transitioned the organisation from a research and development start-up to a viable commercial business. Under Dr Cerneaz’s leadership, the company successfully listed on the London Stock Exchange’s AIM Board. He subsequently guided the company through the global financial crisis, rebuilding it as a world-class technology development company.

Dr Cerneaz also spent four years with Mirada Solutions, a privately funded Oxford University technology spin-off, playing an instrumental role in overseeing the company’s growth from a six-person start-up to a profitable business with 75 employees, as well as the company’s trade-sale to CTI Molecular Imaging in 2003. He was then appointed COO and in this role oversaw the integration of Mirada into the broader CTI operations.

Dr Cerneaz takes over at The Warren Centre from Professor Mike Dureau, who has retired from the role of executive director after nine successful years. Professor Dureau will continue to serve as a non-executive director.

‘The Warren Centre board is delighted to welcome Nick Cerneaz to the helm,’ says chairman Chris Vonwiller. ‘His outstanding experience in technology and engineering across a broad spectrum of applications, coupled with his leadership abilities, will help ensure that The Warren Centre continues to foster excellence and innovation in engineering throughout Australia.’

CHINESE STUDENTS IN TWO-STEP WITH SYDNEY

This year the faculty will welcome a group of top electrical engineering students from Harbin Institute of Technology (HIT), China, to complete the final two years of their Bachelor of Engineering (Electrical) degree at the University of Sydney.

This will be the first group of students selected to undertake the elite 2+2 program as part of a new partnership with HIT, which is ranked second in China for engineering programs. HIT has indicated its support to expand the program into other engineering disciplines in future as the partnership continues to strengthen.

This collaboration arises from a long-term relationship between the faculty and HIT, which involves strong research links. The University recently hosted a senior delegation from HIT led by HIT Chairman Professor Wang Shuquan, and during this visit a renewal of the cotutelle agreement was signed to continue supporting the exchange of civil engineering PhD students.
BILL AND MELINDA GATES FOUNDATION SUPPORTS WORK ON MALNUTRITION

BY JOCELYN PRASAD

If Shu Ning Bian’s undergraduate engineering project comes to fruition, newborn babies in the developing world will stand a better chance of staving off malnutrition.

Shu Ning is part of a team led by Dr Alistair McEwan from the School of Electrical and Biomolecular Engineering to receive a US$100,000 Grand Challenges Explorations grant from the Bill and Melinda Gates Foundation to further develop a non-invasive, solar-powered device to measure body fat in newborns.

Monitoring body composition helps to detect newborn malnutrition, which is key to reducing infant mortality worldwide. Non-invasive machines currently available are expensive, bulky and unsuitable for use in areas where there is an unreliable electricity supply and little technical expertise.

The grant gives Dr McEwan, Professor Heather Jeffery from the School of Public Health and Shu Ning the resources to further test the efficacy of their prototype.

Shu Ning’s work on the device came from his search for an undergraduate honours thesis project, a requirement of his degree.

‘This spoke to me,’ he says, ‘because it makes the world a better place and involves hands-on work.’

Involved from the project’s inception, Shu Ning helped to write the grant application and was instrumental to building a prototype. Central to the device is an embedded computer running an algorithm developed by Shu Ning to measure body fat.

Using infrared technology and other off-the-shelf components, the device is solar-powered and the intention is to build a model costing less than five dollars per unit.

‘It won’t fix malnutrition by itself,’ says Shu Ning, ‘but it will allow more people to detect malnutrition early.’ This will allow for much earlier intervention and more efficient use of scarce healthcare resources in developing countries.

Currently unnamed, the device is being tested for accuracy at Royal Prince Alfred Hospital. While results to date are encouraging, they are preliminary and more data needs to be collected. Funding from the grant allows the team to hire a research nurse to develop a more structured and robust patient testing program, delivering the solid results required to advance the project further.

Like all grants from the Grand Challenges Exploration program, this one could potentially lead to a follow-on grant of US$1 million from the foundation.

Dr McEwan oversees the University of Sydney’s electrical stream in the biomedical engineering program, combining electrical engineering and biology to make inexpensive physiological monitors that reduce the strain on public health budgets.

FUN, FARE & FUTURE ALUMNI

The University of Sydney’s alumni community is a valuable resource for students, who have much to gain from their experience. ‘Fun, fare & future alumni’ is a program connecting current local and international students with alumni. Alumni are invited to host a meal for approximately four to six students, offering a relaxed and friendly environment for students to draw inspiration from the professional and personal achievements of their host while also exchanging experiences and forming friendships with each other. Gatherings may range from a leisurely breakfast to a barbecue lunch or a formal dinner, and can be held in the home of the host, at a restaurant or elsewhere – the host decides.

You can assist by volunteering to host a gathering in 2012. For more information, please contact the Alumni and Events Office on +61 2 9036 9504 or visit sydney.edu.au/alumni/hospitality
CAMEL FAT AND USED OIL FUEL EPIC AUSTRALIAN ADVENTURE

BY JOCELYN PRASAD

Camel abattoirs don’t feature prominently on your average tourist’s hit list, but when postgraduate engineering student Bob Miles chanced across one in outback Australia he knew he’d found himself an oasis.

Bob was a member of a four-person team that last year set itself the task of driving across Australia without stopping at a petrol station. The foursome powered their Land Rover and boat with biodiesel made from waste materials found along the way, processed into usable fuel on a portable processing plant. They documented their journey on film, with the resulting 12-part documentary series The Aussie Way Up being broadcast on the National Geographic Channel in January this year.

Charged with producing fuel for the journey, Bob typically found himself in fish and chip shops, restaurants and cafes in search of used cooking oil, but it was camel fat from an abattoir on the Tanami Track in the Northern Territory that powered the crew along to Halls Creeks in Western Australia. ‘The exhaust wasn’t too pleasant,’ recalls the Master of Philosophy (Engineering & IT) student, whose research into portable biodiesel plants resumes this year.

While united in their bid to promote sustainable fuels, Bob says each of his travelling companions embarked on the journey for different reasons. His main aim was to travel: ‘I was at the end of my aeronautical engineering undergraduate degree and really had the desire to travel. I’d also learnt about biodiesel through uni. It’s a great way to enable sustainable travel, so I thought, “Why not put the theory to test?”’

Setting out in April last year, the crew took eight weeks to traverse all eight states and territories, covering a total of 12,000 kilometres. They ran out of fuel at least 10 times along the way, according to Bob. ‘It was a lot harder than I anticipated,’ he says. ‘There were moments when I felt like throwing in the towel.’

While the support they received on the road strengthened their resolve, they also met with detractors. ‘We met people along the way who had preconceived ideas about biodiesel,’ says Bob of those who voiced concerns about biofuel production competing with vital food supplies. ‘The food vs fuel debate has been resolved through second-generation biofuels, which use renewable sources and don’t affect the food chain. The only people who didn’t seem too stoked with us were pre-existing biodiesel producers. That’s because we were about to publicise the fact that anyone can go to a fish and chip shop, take their waste and turn it into fuel.’

Bob and his fellow travellers – Oscar Peppitt, Justin Hancock (both University of Sydney alumni) and Chuck Anderson – are hoping to go global this year, travelling to Norway by second-generation biodiesel-fuelled boat and car.

When they’re not planning epic journeys or looking for ways to pay their bills, the foursome promotes ‘designer sustainability’ on their website thegreenwayup.com.
FACULTY CONTACTS

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ENGLISH & INFORMATION TECHNOLOGIES

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