

MONELEC ALUMNI NEWS

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Department of Electrical and Computer Systems Engineering, Monash University

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From the President of SMEEA



The University has been making a big thing about its 50th birthday. I started as a Lecturer in Electrical Engineering in 1964 so I can recall quite a lot about the early days. A few weeks ago Graeme Davison, a Professor of History at Monash, made a presentation in the BMW Edge (Federation Square) about the origins of the University and what went on

in the first few years. He showed some fascinating images that included a number of our graduates. The University has much to be proud of and certainly our Department has made great contributions during those 50 years.

Turning from historical matters to the present day, there was quite a shake up in the Department during 2007. Twelve academic staff as well as a number of general staff departed, either through retirement or for other reasons. They included **Hamid Abachi, John Bennett, Francesco Crusca, Greg Egan, Tsun Ho, Stewart Jenvey, Ian Kaminskyj, Robin Lisner, Ming Liu, Nallasamy Mani, David Morgan and Ahmed Zahedi**. The reduction in numbers is related to the downturn in student interest in electrical and computer systems engineering, but it has left many gaps and the Department is in the process of seeking to rebuild.

In addition to the departures in 2007 **David Suter** has recently accepted appointment to a Chair at the University of Adelaide. He also will be sadly missed.

We usually have a **SMEEA dinner** at this time but I have not made preparations for one this year because I will be away for three months – traveling in the Northern Territory and Western Australia. Should be fun! Perhaps we could have a dinner next year when I could show my slides of the trip! Then again, perhaps not.

Alan Finkel (BE 75, PhD 81) has been installed as the University's seventh Chancellor as foreshadowed in last year's newsletter. He is a remarkable man who has achieved much in life, including graduation in ECSE. We wish him well! You can read more about him on the University's website www.monash.edu.au.

Each year a few of us oldies get together for a good natter and to reflect on how good things were in our day! In January we had a house full of **John Bennett, Bill Bonwick, Greg Cambrell, Ed Cherry, Kishor Dabke, Lucian Gruner, Peter Hart, Grahame Holmes, Lindsay Kleeman, David Morgan, Kim Ng,**

Khee Pang, David Wilcox and assorted wives. Recognize any of those names? Bring back memories?

Bill Brown

From the Head of Department

....There have indeed been many changes in the department over the last 8 months, however, we are now in a good financial position to meet future challenges. One of these is a very nice challenge to have: the entry scores for Monash Engineering are going up and up! This means that we can now focus our attention on bright and motivated students; our key strategy is to try to convince them that ECSE is a more rewarding career than Civil Engineering!



To this end, we have redeveloped the 1st year and project labs, which now have 72 Arbitrary Function Generators, connected to 72 PCs with MATLAB, and 72 100-MHz 4-channel colour oscilloscopes. With this equipment we can generate and analyze real-world waveforms, such as heartbeats, ultrasound, radio signals and music. We can even generate *real* sinc functions, and you can check out their spectral content using the FFT on the 'scope. IEAust gave us a special commendation for our laboratory and workshop facilities on their recent accreditation visit.

On the research side, we are winning more competitive grants, and importantly, we are involved in more high-value industry research projects <http://www.ecse.monash.edu.au/news.html>. Our strengths continue to be power, communications and RFID, robotics and vision, biomedical engineering and control applied to medicine (see the 2007 Lampard Prize article). We have made significant investments in cutting-edge equipment so we can compete on the world stage, including 3 GHz 'scopes in the power and HV labs (!), and up to 70 GHz (or 20 GHz real time capture) in communications. Interestingly enough, both the Agilent and Tektronix real-time digital scopes have **Cherry-Hooper** front-ends, so there is a little bit of Monash history in every electronics lab!

You may also like to see where our 4-th year project students find themselves nowadays: <http://www.monash.edu.au/news/monashmemo/stories/20080514/career-lift-off.html>. I am sure this project was more fun than Civil engineering!

Arthur

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Death of John Badcock



John Badcock was one of the early members of staff in the Department and made an enormous contribution in the telecommunications area. He died last year from a brain tumour.

John joined Doug Lampard as a PhD student after completing BE and MEngSc degrees at Melbourne University. His PhD thesis was entitled 'Thresholds in communication systems'. During his PhD candidature he was appointed as a Lecturer in the Department and quickly set up an excellent telecommunications undergraduate program with first rate laboratory modules. These became the basic experimental test benches for generations of students as they learnt about modulation and signals in noise.

John left Monash to join Daryl Hooper (of Cherry and Hooper fame) at Latrobe in an effort to establish electronic and communications engineering at that University. Their efforts faltered (temporarily) and Daryl returned to the UK. John joined Melbourne University at a time when the Department there was going through a bad patch. John then ceased to follow teaching pursuits and became a full time researcher. He had various stints back at Monash, back at Melbourne and also at the ANU. Finally he set up his own consulting business and operated successfully from home, even building equipment for dedicated purposes for his clients.

John was a truly remarkable person. His knowledge and understanding of electronics and communications was comprehensive. He had a great ability to impart his knowledge. He was ready to adapt to a changing world, taking studies outside his own area when the need arose. John was unassuming and gentle. It was always a great pleasure to chat with him. His death is a great loss to his family and to his many friends and colleagues.

The photograph shows a very young John Badcock in 1965.

The Douglas Lampard Prize for 2006

The Douglas Lampard Electrical Engineering Research Prize and Medal for 2006 was awarded to Albert Diosi for his PhD thesis entitled '**Laser range finder and advanced sonar based simultaneous localization and mapping for mobile robots**'. The work was carried out under the supervision of Lindsay Kleeman.

Albert made significant research contributions in three areas of the important mobile robot task called simultaneous localisation and mapping (SLAM). Firstly, he developed new systematic and random error covariance models for laser range measurements and extensively tested these experimentally. The models were used in estimating error covariances of line and corner features that are commonly extracted from the laser data and used in robotic mapping.

Albert's second major contribution was in fusing sonar data from a new advanced sonar system with laser range data to solve the SLAM problem in environments where using either sensor alone fails. Albert was the first researcher to exploit synergies between laser and advanced sonar sensors to generate maps that enable a robot to navigate autonomously.

The third area of research contribution was in laser scan matching whereby the relative position and orientation of robot positions can be estimated from laser scans from those positions. Albert developed a new, faster, more accurate approach to laser scan matching called Polar Scan Matching (PSM). By working in the native polar coordinates of the sensor, searching for correspondence between laser measurements can be simplified compared to other matching approaches. PSM was applied to solve SLAM where the landmarks are full laser scans, allowing for robust landmark association. The PSM work has been accepted for publication in the prestigious *International Journal of Robotics Research*.

The examiners for his thesis, Professor Ohya from the University of Tsukuba, Japan and Professor Wernersson from Luleå University of Technology, Sweden were impressed by Albert's excellent level of theoretical and experimental investigations and the balance between scientific and engineering points of view.

The degree of PhD was conferred on Albert in June 2006.

Albert was born in Slovakia and attended the Slovak University of Technology in Bratislava where he gained bachelors and masters degrees in control systems engineering. During his studies he worked in industry in Slovakia, including a period with Volkswagen. He commenced his PhD studies with Lindsay Kleeman at Monash in 2001 and was supported with a Monash Graduate Scholarship and a Monash International Postgraduate Research Scholarship. Following the submission of his thesis he gained postdoctoral experience with IRISA/INRIA in Rennes, France. He now works with the vacuum cleaner firm Dysons in London where he is applying robotic techniques to vacuuming.

The Douglas Lampard Prize for 2007

The Douglas Lampard Electrical Engineering Research Prize and Medal for 2007 will be awarded to Zhaolin Chen for a PhD thesis entitled '**Image reconstruction in accelerated magnetic resonance imaging – a systems approach**'. The work was carried out under the supervision of Jingxin Zhang.

Zhaolin has investigated the shortcomings of the current techniques used in accelerated image reconstruction from magnetic resonance scans. Using techniques from system identification, multirate filtering, system inversion and system optimization he has developed new reconstruction methods. Experimental results on real MRI data sets demonstrate that these new methods are superior to those currently in use.

Zhaolin's work has been published in the international journal *Computerized Medical Imaging* and at eight international conferences. The work is also the subject of a patent application.

One of Zhaolin's examiners, Professor Wu of RMIT University, states that 'The candidate and his supervisor should be congratulated for producing such a high quality work on an extremely challenging topic in a very competitive field'. The other, Associate Professor Zhang of the Nanyang Technological University, states that 'The thesis shows that the candidate has built up solid background knowledge in the theory and technology of medical imaging and signal processing and a strong capability in conducting analytical and experimental research'.

The degree of PhD was conferred on Zhaolin in May 2008.

Zhaolin obtained his bachelor's degree from the Harbin Institute of Technology, China, where he was awarded a first class People's scholarship in his final year of study. He commenced his PhD with Jingxin Zhang at Monash in 2002 and was supported with a Doctoral Completion Scholarship, a Monash Departmental Scholarship as well as Jingxin Zhang's research funding. He is now a postdoctoral research fellow with Gary F. Egan at Neuroimaging and Neuroinformatics Group, Howard Florey Institute (HFI), the University of Melbourne. He is currently working on MRI hardware and software developments for super-resolution of human brains. This research has potential impact on many human disease studies such as Alzheimer's and Parkinson's disease. Several organisations are involved in this research including HFI, Neuroscience Research Institute of Korea, Siemens Australia and Monash University.

From the 70s

Steve Mutabazi (BE 75, MEngSc 1985) is an entrepreneur and business executive with international experience in the Information & Communications Technology (ICT) industry. He commenced his career as a telecommunications engineer in 1976 with the then Telecom Australia (now Telstra).

Steve's entrepreneurial career dates back to the mid 1980s, when he founded an IT company to acquire and commercialize partially developed financial services software from a firm of chartered accountants. The company fully commercialised the product and secured major customers, including the then Australia's top two publicly listed companies. Steve later merged the company into Infolink Group Ltd, a venture capital funded company in which he was a founding member of the Executive Board.

At the onset of deregulation of telecommunications in 1990, Telstra Corporation appointed Steve to an executive position to lead a key corporate initiative designed to protect its business with the top 500 Corporate & Government customers. Steve led six other strategic initiatives during the company's first 6 years of competition, including significant aspects of the *Future Mode of Operation* initiative to fully digitize the company's network and automate its key business processes. He also played a leading role in Telstra's

Front Office Re-build Program to fully modernize the company's customer facing operation.

From 1997 to 2000 at Hewlett-Packard Company, Steve led the company's Asia Pacific Internet Services Program, in an entrepreneurial role specifically created by Hewlett-Packard's global management in the USA to strengthen its business in the then emerging Internet Service Provider market. In this role Steve covered 12 countries, including Australia, China, Taiwan, South Korea, India, and South East Asian countries. Steve provided leadership to sales, marketing and consulting teams based in these countries to win new business and deliver internet and e-commerce infrastructure to major telecommunications service providers within the region.

In early 2000 the then newly listed Melbourne IT Ltd appointed Steve as Chief Marketing Officer and also as CEO-designate to establish a new line of business. The launch of the new line of business was abandoned due to the "dot com bubble burst".

In 2001 Steve founded and is the current Managing Director of Ausanda Communications Pty Ltd, a technology company which is developing innovative telecommunications products to address the significant cost barriers that telecommunication carriers currently face as they roll out major bandwidth up-grade programs. These innovative products significantly enhance the widely installed dense wavelength division multiplexing (DWDM) platforms, enabling seamless carriage of significantly higher data rates per channel than is possible over currently installed optical transmission networks.

Of special significance is that the development of these products has involved significant collaborative effort between Steve's company and the Department's team led by Dr Le Binh. Collaborative activities commenced in 2005 and led to a Contract Research project funded by his company and a Linkage grant project also sponsored by his company. Steve intends to maintain this close relationship between his company and the Department

Steve is a *Research Associate* of the Faculty of Engineering.

From the 80s

Art Coolidge (BE 80) came to Australia from the US in the 70s. After secondary teaching in Melbourne he enrolled for our BE. His grades were not auspicious. He claims he holds the record for the highest number of sups for a student completing the degree!

He returned to the US after graduation and settled in Oregon. He wrote to a number of us recently to bring us up to date with his career. He sent us 15 pages of handwritten material! But well worth the read. Here are a few excerpts:

'In terms of personal pride, my Monash degree ranks well ahead of my US undergrad and master's degrees.'

'Not long after leaving Australia I began work with Intel Corporation in Hillsboro, Oregon. I was with the 'Manufacturing Engineering Development' department

and was involved with the development of an ion implanter monitoring and control system.'

'In 1985 I shifted to a small start-up firm to write software for board-testing of components for an optical reticle engraver. At my interview I risked candour and honesty to enquire if my sole experience with Intel x-86 processors would be a problem since their machine relied, entirely, on the Motorola 68xxx processors. My interviewer said "No worries – it will take you a week or two to learn the Motorola processor. There are two kinds of programmers: those that prefer the Motorola CPU and those that lie." I guess nobody programs in assembly language now but back then it was a breath of fresh air to start working with a CPU that had orthogonal register sets, rather than registers whose function seemed more dependent on the day of the week.'

He then moved to work for a machine vision company in Medford Oregon. He says 'It was the most challenging and interesting work I'd done ... working for the most POORLY MANAGED company I had ever encountered!'

'I can't recall, after shifting to Medford, Oregon employment in 1987, which came first on the rural 50 hectares where we live: Did I get the sheep for training the Border Collie or did I get the Border Collie for herding the sheep?' (Art holds a Beginning Sheep Shearing Certificate and shears his own sheep.)

After some years of engineering work Art took partial retirement. He got involved in the training of volunteer firefighters, he took on some part time maths instruction and then applied to be a 'Court Appointed Special Advocate for Children'. In this role he has been involved in all sorts of difficult situations but clearly he has had some success and fulfillment.

He finishes his letter with a page of calculations related to the power factor correction on a 300hp motor he had seen in a lumber mill!

It was very nice to hear from him and to think that he has put his training at Monash to good use.