THE UNIVERSITY OF AUCKLAND
FACULTY OF ENGINEERING
Department of Engineering Science

DES News

July 2010 | **Alumni and Friends quarterly newsletter** | Number 07

Dear Alumni and Friends

The first semester of the 2010 academic year has just finished, and both staff and students are fully engaged in exams. Since its inception, this Department has been responsible for teaching mathematics to all the engineering students, as well as servicing the academic needs of its own students. We are also heavily engaged with teaching Part I computing and part of the compulsory Engineering Biology and Chemistry course. At exam time, the Department is faced with the task of marking and collating grades in a relatively short period of time. With approximately 600 students in each Part, this is no small feat, particularly for the core Mathematical Modelling courses. In earlier years when there were fewer students in Engineering, all our exams were marked only by those that lectured in the course. However, the marking task (and the short time period available to determine the final grades) has now grown too large to be handled by just the lecturers themselves.

Thus, for the last 3 years, the entire academic staff of the Department have been called into action to help mark these core papers, with staff sequestering themselves in one of our seminar rooms for the duration of their part of the marking. Understandably, staff are always well relieved when this part of the semester is finished.

On another note, this Department will experience a "triple 70th" this year. Both Ian Collins and Mike O'Sullivan turn 70 this year. Collectively they have also completed 70 years of service. We will be celebrating these significant milestones later this year, but I am sure there are numerous alumni out there that have fond memories of these two staff members and who may wish to share one or two of these memories with us (for publication in the next newsletter). I think there is not a single alumnus out there that does not remember either Mike or Ian. Neither are planning a retirement yet – they are still too young for that!

As always, please feel free to provide feedback, using the email below, on this newsletter. In particular, if there is some aspect of the Department that you would like to hear about in this newsletter, please let me know.

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In this issue

Backissues

Available at
http://www.des.auckland.ac.nz/uoa/home/for/alumniandfriends/des-news

For future editions

Do you have news to share?
News on current Department members is easy to include, because they're right here. News on wider family members - alumni and former staff - doesn't necessarily reach us. If you have something to share, email it to desnewsletter@auckland.ac.nz

Featured Alumni

Grace Meyer, Class of 2009

Starting university, I was determined about two things: I was going to do engineering, and I was not to follow in my father's footsteps and become an Engineering Scientist. Six weeks into a C&M specialisation, I realised that Eng Sci was what had always really fascinated me and convinced Ros Archer to let me swap over.

My father was always working on optimisation projects which helped me put the methods and theory we learnt at uni in perspective. I knew implemented applications and their worth so I never had to ask "What am I doing this for?"

My time at uni was excellent and I made many close friends. I specialised in O.R. and am very interested in LP modelling. As well, I participated in two Uni Games for rowing and Ultimate Frisbee and in 2008 we won gold for Ultimate.

I am currently working for Derceto and it is brilliant working with people from Eng Sci on an optimisation product. At the moment I am focusing on a live software upgrade to a major client and a feasibility study for Lincoln, Nebraska.

As well, thanks to the fact I have a great job I can now do all of the other activities I enjoy; over summer I competed in the Women's North Island Champs for Ultimate Frisbee and went diving at the Poor Knights. I have also just joined a ski club and plan to spend a lot of time down on the slopes this year.

Jeff Meyer, Class of '83

Jeff went on to co-found The Optima Corporation, a world leader in the provision of decision support tools for emergency services. He is now working in the middle east. More on Jeff and Optima next newsletter.

Autumn Graduation 2010

We welcome anew the following to the DES family, who have gone from being students to alumni. Congratulations to you all.

BE Biomedical Engineering

Walimuni Abeysekera
Alexander Anderson
Laura Bear
Sandeep Chollangi
Aditi Gulati
Alakananda Iyengar
Xiaohao Jin
Callum Johnston
Wenying Kang
Vignesh Kumar
Eppuje Kwon
Rachel Lees-Green
Irvin Lim
Thomas Lintern
Helvin Lui
Amani Mashal
Matthew Parker
Adam Reeve
Carlo Salvador
Matthew Sinclair
Ellyce Stehlin
Elizabeth Theakston
Tony Tse
Xiani Yan

BE Engineering Science

Gaurang Ambani
Jeremy Amadio
Abhishek Anupuri
Pablo Bowen Montenegro
Vincent Budelmann
Eduard Bulog
Solai Chidambaram
Antony De Pont
Graham dos Santos
Kane Harton
Wing Kam
James Kirch
Anna Klepacki
Mansee Latawa
Kit Leung
Michael Leon
Qi-Shan Lim
Grace Meyer
Megna Murali
Pratik Upadhyay

In addition to the BEs, Pang Fei Cheung was awarded a ME in Engineering Science, and Andrea Raith (featured in the June 2009 edition of the newsletter as a new staff member) is now formally Dr Andrea Raith. Her thesis was on "Multi-objective Routing and Transportation Problems", and she was supervised by Associate Professor Matthias Ehrgott, Dr Judity Wang of the Energy Centre, and Dr Stuart Mitchell.

Keeping the family within the Department

The autumn graduation was special for us for another reason. Grace Meyer, who graduated with a BE Engineering Science is the daughter of Jeff Meyer, Class of '83. Similarly, John Davidson - now Dr John Davidson with a PhD in Bioengineering - is the son of Barry Davidson, BE Class of '71 (fourth Engineering Science group to graduate), and PhD in Engineering Science in 1976. John is also a member of the first group of BE Biomedical Engineering students, who graduated in 2005.

2010 Spark Ideas Challenge winners

Over 450 people attended the recent Spark Ideas Challenge Prize Giving to congratulate the winners, whose ideas had to demonstrate how engineering practices can be applied to provide solutions to real world problems.

The G.I. Joes were not only awarded one of the ten $1,000 prizes in the commercial entrepreneurship category, but also walked away with the $1500 cash prize for best biotech idea - courtesy of Chiasma.

Left to right: Niranchan, Peng, Greg, and Tim

The G.I. Joes are composed of Peng Du (Team Leader, BE Biomedical Engineering graduate and PhD candidate), Greg O'Grady, PhD (Surgery Department Research Fellow), Tim Angeli (PhD candidate) and Niranchan Paskaranandavadivel (BE Biomedical Engineering graduate, now on a Uniservices scholarship). Andrew Pullan is the main supervisor for Peng, Tim and Niranchan, and co-supervisor for Greg through the Auckland Bioengineering Institute.

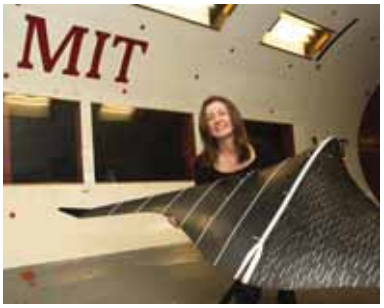
The Sparks Ideas Challenge called for a 1,000 word proposal detailing a business or social idea. The G.I. Joes' public disclosure summary is as follows:

Our venture entails commercialisation of a novel medical device and software package to record the electrical activity arising from the human stomach, without the need for invasive surgical procedures. The purpose of this system is to present a routine medical tool for diagnosing "gastric dysrhythmias" - abnormal electrical behaviours in the stomach that can contribute to very common and highly symptomatic diseases including heartburn and indigestion. To this end, we have assembled a multidisciplinary team of clinicians and biomedical engineers who are experts in gastrointestinal (GI) experimental research, device development, software development, and commercialisation. Our current roadmap is to develop and validate a second generation prototype of this system for commercial release via a three-step process: an initial niche research market, a secondary low volume clinical market, and ultimately a mature, large volume clinical market. We will seek an industrial partner at the secondary phase to take our prototype into mass production.

Recognition for one of our star alumni, Karen Willcox

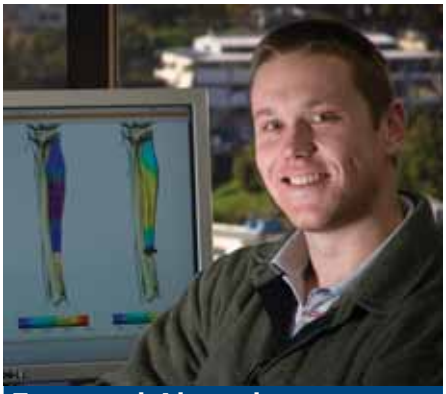
Associate Professor Karen Willcox was named last Friday as one of 6 Emerging Leader Awardees by the Sir Peter Blake Trust.

The Sir Peter Blake Leadership Awards were held on June 25th, and mark the commencement of 'Leadership Week', which highlights the strategic relevance and value that great leadership provides for New Zealand and showcases the work being done to develop our nation's leadership capability.



Karen graduated with a BE in Engineering Science in 1994, and went on to do a PhD at the Massachusetts Institute of Technology (MIT). She has worked for NASA and Boeing, and is a tenured Associate Professor at MIT - an enormous accomplishment in itself. Her dream is to become an astronaut. We are incredibly proud of Karen, and are thrilled to see her recognised in this way.

For more information on why Karen won the award and more information on Karen



Featured Alumni

John Davidson, Class of 2004

During my BE (Biomedical Engineering), I found that I became more interested in the mathematical modelling aspect of the subject and decided at the end to enroll in a PhD as I felt that this would benefit me in future when applying for jobs involving research and modelling.

My PhD was in Bioengineering, with the Auckland Bioengineering Institute, and my supervisor was Andrew Pullan. My thesis was on linking the physiology and functional organisation of skeletal muscle with whole muscle mechanics. I really enjoyed the environment and people involved with postgraduate life at the Institute.

Since I finished my PhD, I've been working for Andrew Pullan as a post doctoral research fellow in the Institute. The general topic I'm working on is mathematical modelling of the gastro-intestinal system.

I've been working with a group from the University of New South Wales on ways to improve the visualisation of some of their data by projecting it onto anatomical models of organs. This method makes it easier to interperate the data.

I've also been working on creating a model on intestinal contraction for a group at the Riddet Institute at Massy which will help them better understand the digestion and absorption of food, and also to design better foods.

Juliet Newson recieves police award

Juliet Newson (Senior Tutor) was awarded the District Commander's Certificate of Appreciation at a ceremony on May 28th for going to the aid of a woman who was assaulted early this year.

A man had just assaulted a woman with him in a car in Symonds St. As Juliet approached, he left the car and entered a building. Juliet went to check on the woman and saw two children also in the car. The victim had called the police but Juliet waited with her.

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Featured Alumni

Barry Davidson, Class of '71

After graduating with my PhD in 1976 I went to seek my fortune in the United States where I worked as a structural engineer/researcher in the nuclear energy field. The advantage of this choice was that it was well funded, as finding "solutions" were imperative. The work I was involved with required close collaboration with staff from the University of California, Berkeley and I made friendships that have lasted to this day.

Thirty years ago it was considered good training for prospective staff of the Auckland Engineering School to have spent some time "out in the real world" prior to beginning a life of teaching and research. While studying,I had had no intention of becoming an academic but after three years in the US I received a letter from the HoD of Civil Engineering (University of Auckland) informing me that he had a position available. I successfully applied and spent twenty eight years teaching and researching in the Department of Civil Engineering, around fifteen of those as Graduate Student Advisor. These were good times and for me some of the greatest rewards were achieved as a result of the working relationships that I made with my graduate students.

Both of our sons have become engineers. At high school, when asked, they would state that "they were going to be engineers when they grew up". I was always concerned that it was too easy for them to do what their Dad did, so I actively encouraged them to look for other options. Whether child psychology played a part, or they could see in the future a worthwhile career, I don't know.

I am presently working for my own engineering company where we get excitement out of performing good designs for some ordinary structures, but we have also have had the good fortune to design some exciting ones too, such as the Kapoor Sculpture at Alan Gibbs' 'The Farm' in the Kaipara (right) and the new Stanley St tennis stadium with a deployable roof.

Rosalind Archer in the news

The Gulf of Mexico oil spill and the award of an exploration permit to Petrobras for exploration in the Raukumara Basin off NZ's East Coast has made oil and gas a very topical issue. Rosalind Archer (Class of '93 and one of our senior lecturers) has research interests in petroleum engineering, and her expertise in this area has attracted a lot of media interest.

This included a live radio interview with Jim Mora on Radio NZ about a Pravda news story in which Russia suggested that a small nuclear device was all that was required to seal the oil leak. The Pravda story claimed that this had been done several times in Russia with an 80% success rate. Rosalind was however very sceptical that this was a good idea in the Gulf of Mexico.

TVNZ 7's 8pm news on June 5th featured Rosalind in a live interview with Miriama Kamo discussing the both the Gulf of Mexico oil spill and exploration in NZ. The Raukumara Basin may hold huge untapped oil reserves. The Gulf of Mexico oil spill has raised public questions over the safety of offshore exploration, especially in deep water. Deepwater drilling in the Raukumara Basin is not imminent since Petrobras will first undertake a seismic data gathering and interpretation campaign which may take four years before they decide whether to drill a well.

Rosalind was also part of a panel of scientists convened by the Science Media Centre in Wellington to do an online briefing on oil exploration issues to a group of journalists. This briefing lead to Rosalind's comments appearing in at least 14 further news stories including the National Business Review, TV3 News, Otago Daily Times, Dominion Post and Radio NZ news.

Barry Davidson's creation: Compusoft Engineering - what it helps create

Compusoft Engineering was been formed as a specialist structural engineering company and it attempts to obtain an edge in the market by providing more high tech solutions to civil and structural engineering problems. An example is the use of seismic isolation in the retrofit of older buildings, a particularly novel solution was enabling the eighty year old Princes wharf in Auckland to be used to support modern structures by the addition of additional damping. This was achieved by installing dampers that dissipate energy through shearing lead plugs under the wharf superstructure and attached to sets of raked piles. Another interesting solution used to mitigate excessive floor accelerations in wind storms for a 40 storey building downtown Auckland was achieved by the addition of a system of liquid tuned dampers. These took the form of water tanks containing approximately 100 tonnes on the roof of the structure.

In its quest to solve more non standard problems, Compusoft Engineering has developed the skills to form find for large tensioned membrane structures. The Kapoor sculpture on the Gibbs' 'The Farm' is a fine example. The basic shape of these structures is dictated by the initial tension and the boundary conditions in the high tech fabric. The anticlastic form used is inherently stable. The Kapoor sculpture is approximately 85m long and is supported at each end by two 27 by 7 m elliptical rings. One ring has its long axis vertical (as in the photograph), the other's is horizontal. Consequently the fabric supported between them transitions through a circle at the mid section. To additionally support the fabric there are 32 aramid cables in sleeves, that in addition to protecting the cables, provide a part of the artistic impression.

Anish Kapoor CBE RA is an Indian sculptor who has lived and worked in London since the early 1970s where he moved to study art. He has had solo exhibits internationally, and amongst other achievements, he recieved the Turner Prize in 1991. More on 'The Farm' and the Kapoor sculpture here.

Juliet Newson recieves police award, continued from page 3...

The victim said she had just been hit with a hammer, and showed a large weal on her back.

Within a few minutes, the assailant returned and began to intimidate and verbally abuse and threaten Juliet, who said later "I thought there was a 70 per cent chance he wasn't going to do anything but at the same time I'm thinking there's a 29.5 per cent chance I could end up with a black eye or broken nose, and at the worst, a small chance he had a knife or something in his pocket." Juliet told the woman to drive up the road to wait at her workplace.

Juliet says: "I tell my children - never let a bully get away with anything."

The police later said that the man was a violent and recidivist offender, who was later arrested and charged with assault. He pleaded guilty.

Changes to Department IT

In the latter part of last year, the Faculty of Engineering embarked on an administrative restructuring that included IT. The outcome was a recommendation that "Where IT services are operated by a Faculty, they should be managed at the Faculty office level (not devolved to individual departments) and thereby integrated with other Faculty management functions." In conjunction with this, a new position of 'Director Engineering IT' was created. Mike Renwick was appointed, taking up the position in February.


Mike Renwick

Our IT staff (Rao Cherukuri, Percy Barboza and Sajy Augusty) now report to Mike, though remain physically with us in our department.


Sajy Augusty

Sajy is leaving us, as he is moving overseas. His last day with us will be July 15th. Sajy has been a valuable member of our IT team for the past 5 years. We all thank Sajy for his help during his time within DES and offer him and his family our best wishes for the future.

The Great Engsci vs Biomed Bake-Off

May saw the second annual Great Engsci vs Biomed Bake-off. Entry was extended from last years Part IIIs (who also ran it) to include all DES undergraduates. This year the organisers Tessa Paris and Angela Buckland introduced a theme to get everyones creativity going. They chose 'Maths' as it seemed to be topical to the department - and Andrew Pullan was really excited about it!

The competition between Engsci and Biomed was very close with Biomed just coming out on top. The judges (Andrew Pullan, Richard Clarke, Piaras Kelly, and Kim Williams) again commented on the high standard of baking, and the thought that went into fitting the baking to the theme.

The winners in each category, and contenders for 'The Winning Whisk' were:

Part II winner: Sue Mun with a 'Mr e' chocolate brownie cake.
Part III winner: Jonathan Munden with a 'B inverse A s - the most important vector in the whole world' cake.
Part IV first equal: Tessa Paris with a Chocolate Pistachio 'Pi' and Angela Buckland with a 'Phi' Chocolate cake.

The overall winner was the baker with the highest overall mark. As both Tessa and Angela were tied on 68 points for first place the judges had to vote for their favourite baked good. This vote lead to Tessa being awarded the 'Winning Whisk' for the winner of the Great Bake-Off for the second year in a row.

The competition is a great initiative on the part of our students. It was good to see other 'Parts' join in this year, and hopefully competition will continue to be held for many years to come.

Left to right: Sue's cake, Johathan's cake, Tessa's pie, and Tessa and Angela being awarded the joint Part IV prize.

News in brief...

Baby girl for Peter Bier

Peter Bier is a dad (again). In Peter's own words: "Fiorella Rose Bier finally arrived last night at 8.55pm, half an hour after we checked into the hospital. A cute 3.43kg little girl came out to meet us. Mum and baby doing well, although we are all very sleep deprived".

Mark Finch heads to the US

Mark Finch (BE Biomedical Engineering Class of 2007, and ME student of Poul Nielsen) is headed to the US for Stanford's prestigious Summer Institute for Entrepreneurship, and will go on to spend three months at MIT. We will be featuring his visit in the December newsletter. For more in the meantime, see here.

Grant success for Andrew Pullan

A submission made by Professor Andrew Pullan has been successful in the most recent Health Research Council (HRC) funding round. His proposal for 'New clinical tools for diagnosing gastric dysfunction' received $1,040,000. More here

Juliet Newson submits thesis

Juliet Newson (Senior Tutor) has submitted her PhD thesis 'Models of geothermal surface features at Wairakei'. Her areas of interest are geothermal reservoir engineering, geothermal surface features and environmental monitoring of geothermal activity. Juliet is also featured on page 3.

New DES website

The Department has a new website. This came about as part of an ongoing standardisation of the look feel and structure of all University of Auckland websites.