

Sydney Division's Excellence Awards Scheme

Once again, the Faculty is a Finalist in Engineers Australia Sydney Division's Excellence Awards Scheme. The joint entry has been submitted by Elaine Bailey of the Illawarra/Sutherland Regional Group (ISRG) of Sydney Division and Bob Wheway from the Faculty of Engineering and is entitled "Promoting Engineering in New South Wales Regional High Schools: the Year 11 Competitions". The entry has been accepted as a Finalist in the Engineering for Regional Communities Category. The submission is based on the ISRG's very successful Engineering Studies Engineering Report Competition which this year has been expanded to include a second Competition for students in Western Sydney and Western

New South Wales.

This year, a third competition for students doing Design & Technology is also being introduced. The Design & Technology Competition is being funded from a \$15000 Challenge Grant provided by the Vice-Chancellor.

This entry follows three previous entries. These were:

* In 2004, "The University of Wollongong's World Champion F SAE Car" which won a Highly Commended Award in both the Welfare, Health, Safety, Education & Training Category and the Small Ventures/Projects &

Reports Category.

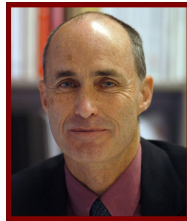
* In 2005, "UoW Racing; 4 Years of Engineering Excellence by Young Engineers" which won the Education Excellence Award in the Welfare, Health, Safety, Education & Training Category. This entry then became a Finalist in Engineers Australia's National Excellence Awards Scheme.

* In 2006, "University/Engineers Australia Co-operation in Promoting Engineering in High Schools: the Year 11 Engineering Report Competition" which was a Finalist in the Welfare, Health, Safety, Education & Training Category.

These four entries continue to promote the Faculty's excellence at the highest Engineers Australia level.

Dean's Spot

In the 1800s, a famous engineer, Isambard Kingdom Brunel, revolutionised many aspects of 19th century living. His vision of harnessing technically achievable innovation to advance society was so profound that it literally changed the world. The world at the time was convinced that horses and carts and sailing ships were as state-of-the-art as it was possible to be, but Brunel could see, and persuade others to see, that this could be changed, and that this change would benefit communities. Much of this change related to his determination to make transport an affordable, comfortable experience. Of course this would also benefit trade, which would fund his vision, but he also saw such travel as a great social benefit: bringing together communities, reducing insularity, and speeding communications. He also wanted travel to be fun and enriching. A small example of this was his insistence that the railway stations, tunnels and bridges he built be more than merely utilitarian structures; he made them also works of art. And in the case of stations, they were also major social centres with shops, food, rest and entertainment areas: at the time no-one had ever seen anything like this. He even went so far as to ensure that passengers on his railway (the Great Western Railway from London to Bristol) would, with the price of their ticket, also receive a cultural experience by virtue of the fact that his railway stations were monumental architectural gems, and on the entrance to tunnels and on



bridge supports he replicated a variety of classical architectural facades for the edification of passengers.

In addition to his ability to motivate and persuade people to share, and pay for, his vision, he had to make some

phenomenal technical achievements and inventions; he introduced new ways of building major (and at the time, huge) bridges spanning rivers and valleys previously thought impossible. He invented new tunnelling methods and improved most other components needed for a modern railway system such as rails, locomotives, sleepers, and so on.

Against the odds he demonstrated that a rail transport system could be constructed over almost any terrain to provide economical transport for people and goods. Later in his life he did this all over again, only this time with ships, pioneering a whole new era of steel ships driven by screws (instead of paddle wheels or sail) which enabled world trade on a scale and with a reliability previously not achievable. Brunel was a prodigious worker, but only a portion of his time was spent on design. Being the Chief Engineer, and so effectively the Managing Director of large concerns such as the Great Western Railway Company, he mastered financial and management skills as well.

He was not an easy person to deal with – most of his life he was operating more or less on the brink of financial disaster, many of his subcontractors went into debt, and his obsession with detail was a weakness (driving some of his colleagues to distraction) as well as a strength (his schemes worked, by and large). However, to quote George Bernard Shaw 'since the reasonable man adapts himself to circumstances all progress must depend on the unreasonable man'. So we can perhaps forgive Brunel his unreasonableness, and be inspired by his determination to challenge conventional wisdom to ensure progress.

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Prize for Railway Engineering

A PhD student who also teaches part time in the Faculty of Engineering at the University of Wollongong has been named “The Young Railway Engineer of the Year 2007 in Australasia”. Behzad Fatahi has been awarded the 2007 Railway Technical Society of Australasia (RTSA) Young Engineer Award for his academic and professional achievements.



University of Wollongong student Behzad Fatahi

Behzad Fatahi, who has been elected as a Chartered Professional Engineer by Engineers Australia and is a registered professional engineer, will receive the award for full registration at the next conference on railway engineering. Behzad also receives return airfares, accommodation, a cash prize and a certificate. The prizes will be presented at the next meeting of the local RTSA Chapter.

The RTSA Young Railway Engineers Award recognises young professional engineers, technologists or associates in Australia or New Zealand who are under the age of thirty and have reached a demonstrated level of achievement and involvement in the field of railway engineering, exhibited technical competence, good character and integrity, and assisted

in developing or improving the attitude of the public and/or the attitude within the engineering ranks towards railway engineering.

Behzad is supervised by Professor Buddhima Indraratna and Dr Hadi Khabbaz and his research is part of a larger project under the CRC for Railway Engineering. His research project demonstrates that railway infrastructure can be improved by identifying and managing surrounding vegetation – refuting the age-old belief that vegetation is detrimental to railway tracks. Behzad has developed a new model integrating geotechnical engineering and botanical science. This model creates a new procedure for designing railway lines in the vicinity of native vegetation resulting in

significant environmental benefits and cost-savings for the rail companies.

The outcomes of Behzad’s research indicate that the influence zone of a single tree is several times greater than its canopy size. For instance, the new geotechnical investigation in Miram, in western Victoria, shows that the influence of a Eucalyptus Largiflorens tree can extend 30 metres from the tree trunk. Results from the computer simulation also show that the influence zone of a gum tree extends more

than 20m. This means that planting trees in a 15 – 20 meter radius from rail tracks can actually sufficiently stabilise the soft formation and save a significant portion of the billions of dollars spent on maintenance. A marriage between botanical science and geotechnical engineering is rare, but it would be a union from which rail industries might profit handsomely.

In September 2006 Behzad was awarded first prize at the Young Geotechnical Professional’s Night – a prestigious geomechanics award from the Australian Geomechanics Society and Engineers Australia. He was also a prize winner at UoW’s Higher Degree Research Student Conference 2005 in the category “Frontier Technologies for Building and Transforming Australian Industries”.

ACARP funding

The Australian Coal Association Research Program (ACARP) has awarded a \$200,000, two-year project to Associate Professors Ian Porter and Ernest Baafi of the School of Civil, Mining and Environmental Engineering to develop a web-based coal mining information management system for the Australian coal mining industry. Both Ray Stace and Dhammika Ruberu of CEDIR are the other members of the research team. The team will work closely with ITS and the Faculty librarian on the project. According to Ian and Ernest, a single domain site will be established to cater for the needs of the Australian underground coal mining industry. A dedicated virtual server will be hosted in UoW ITS machine room, and public access will be allowed to the site content only through the university’s firewall. Windows file sharing will be allowed from a number of nominated machines in the Faculty and CEDIR for content update and management.

Diary Dates

12 June WAC Committee

19 June Faculty Committee