

ACI Newsletter, Number 35, June 2007

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Benjamin Bohringer and Sung Han Cha – Joint Winners of the 2006 A-C-I Undergraduate Thesis Prize

Two ACI Undergraduate Thesis Prizes have been awarded for 2006. After much deliberation the assessment panel could not differentiate between two exceptional pieces of work and therefore joint winners have been declared.

The winners are **Mr Benjamin Bohringer**, recently graduated from the University of Newcastle, for the thesis "*Non-linear model predictive control: a multiple linear controller approach*". The work was supervised by Dr Brendan McGrath of the School of Electrical Engineering and Computer Science.



Figure 1: Dr. Nigel Hancock (left) presenting the award to Mr Benjamin Bohringer

And **Mr Sung Han Cha**, recently graduated from the Australian National University, for the thesis “*Coupled non-linear state estimation and control for low-cost aerial robotic vehicles*”. His project was supervised by Dr Robert Mahony of the Department of Engineering.



Figure 2: Dr. Nigel Hancock (left) presenting the award to Mr Sung Han Cha

In the view of the assessment panel, both theses demonstrated a depth of theoretical understanding in control system analysis and design which was quite exceptional at undergraduate level. However, what particularly impresses the assessors was that neither was solely a theoretical contribution. Both of the projects undertaken achieved results which are of real practical application and both are significant contributions to the solution of important practical problems.

The winners and commendees were announced and the prizes presented at the M. A. Sargent Medal Dinner of the Electrical College of the IEAust, held on 1st June 2007 at Rushcutters Bay, Sydney. Dr Nigel Hancock, past Chair of the NCACI, presented the awards. Each award comprised a medal, a certificate and a cheque for \$2000.

Certificates of Commendation were also awarded to:

- Mr David Harney, graduate of the University of Southern Queensland (Faculty of Engineering and Surveying), for the thesis “*Tablet press control system modification*”;
- Mr Shaun Haskey, graduate of the University of Western Australia (School of Mechanical Engineering), for the thesis “*Active isolation of vibrations using pneumatic isolators and on/off solenoid valves*”;
- Mr David Mate, graduate of University of Technology, Sydney, (Faculty of Engineering) for the thesis “*The development of a microprocessor-based network protector*”; and

- Mr Stephen Schilling, graduate of University of South Australia (School of Advanced Manufacturing and Mechanical Engineering), for the thesis “*Automated cistern test station for Caroma Dorf’s cellular manufacturing facility*”.

The IEAust Undergraduate Thesis Prize in Automation, Control and Instrumentation was inaugurated in 1995 to recognise individual excellence achieved in undergraduate project work across the breadth of A, C & I. The quality of work presented has been such that the prize has been awarded each year since then: in addition a total of 38 Certificates of Commendation have been awarded for prize-worthy work of other applicants.

Dr. Nigel Hancock
Chair, Thesis Prize Panel 2006,
NCACI

2006 National ACI Project Excellence Awards

The National Project Excellence Awards is run biennially and aims to recognise outstanding applications of Automation, Control & Instrumentation. The objectives of the Awards include the promotion of better engineering through encouraging applications of ACI, which are cost effective, commercially viable while providing demonstrable environmental, safety and social benefits to Australia.

The 2004 National Project Excellence Award was awarded to Industrial Automation Services and BlueScope Steel for the Hot Finishing Mill Upgrade Project.

The National Committee for Automation, Control and Instrumentation are seeking submissions for the 2006 Awards from the 11th of December 2006 with close of submissions on the 3 December 2007. The application form and entry details are available on the NCACI website at <http://www.engineersaustralia.org.au/ncaci/>.

There are two categories for entry:

Category 1: Major Projects – Team projects where person time required for the project is larger than 10 person years (\$1000 application fee)

Category 2: Regular Projects – Smaller team projects or individual projects where person time required for the project involves less than 10 person years of effort (\$200 application fee)
Young engineers are especially encouraged to submit applications under this category.

To register your interest or for any enquiries, please contact Mrs Aylwen Gardiner-Garden, the NCACI Committee Administrator via email at agarden@engineersaustralia.org.au

NCACI Visibility: Possibility of a Regular National Australian Conference

As a part of our strategic plan we need to consider the visibility of the NCACI in Australia. The possibility of hosting a regular Australian conference in the NCACI arena is still under discussion. As mentioned previously, one approach would be through a similar style to the Control’95 and Control’97 Conferences. Some concerns have been raised as to whether we could attract enough authors and delegates on a regular basis to host such a conference series. Although we have received some input on this topic, further suggestions, ideas and feedback on this topic are most welcome. NCACI would particularly welcome the input from industry

based colleagues as to the need/usefulness of having a regular conference forum to discuss the practice of control and automation projects in Australia.

The feedback that we have received so far, indicates that there would be value in providing a regular (perhaps every two years) forum for ACI and process modelling. Among other things the following three suggestions were also received:

- 1) "An overemphasis on theoretical control topics will not encourage industrial participation."
- 2) "Some form of exhibition attached to the conference can help the financial aspects significantly and attract more industry representation."
- 3) "An active personal solicitation of participants for each industry segment is essential if there is to be any chance of success. People are much more likely to go if they know that other specialists in their area of interest will be present."

The committee would like to thank those that have already submitted some suggestions.

The ACI Undergraduate Thesis Prize – 2007 and beyond

Following ten years of successful operation the entry and eligibility requirements have been expanded, and the changes will apply from this year, 2007.

Over these ten years twelve prizes have been awarded, initially \$1000 and in recent years \$2000, and also a total of 17 Certificates of Commendation for theses also judged prizeworthy. All represent excellent work from engineers-to-be and this bodes well for the continuing health of innovative ACI engineering in Australia.

Whilst these awards have almost all been for individual work reported in individual theses, some universities have moved to collective, team activities in the final-year project of their engineering degrees. The NCACI believes that ACI excellence in such arrangements should also be recognised and the entry and eligibility requirements have been revised accordingly. And if the quality of the work and the theses warrants it, a prize will be awarded in both individual and team categories.

The revised regulations and application form are available on the EA website: <http://www.engineersaustralia.org.au/ncaci/>. The closing date (annually) is the 15th of December.

If you are an academic please recommend to your students, both those in 2006 just completing and those who may be lining up to undertake an ACI final-year project in 2007.

If you are in industry please consider sponsoring some undergraduate project work for 2007. This will not only encourage soon-to-graduate students to consider ACI as a career, but also can 'tin-open' some of those investigations, enhancements and activities which you have been meaning to get around to but never have the staff available because they are not on today's critical path. ACI engineers in academe will be more than willing to commend an industry-sourced project topic to students and provide student supervision. And you may well identify a good graduate to employ.

And if you have any queries please contact Aylwen Garden, ACI Undergraduate Thesis Prize Administrator: agarden@engineersaustralia.org.au

13th M2VIP Conference 2006



The 13th Mechatronics and Machine Vision in Practice (M²VIP) Conference was held at the University of Southern Queensland (USQ) in Toowoomba from 5 to the 7th of December 2006.



Figure 3: The USQ Campus and location of the 13th Mechatronics and Machine Vision in Practice Conference in Toowoomba

The conference has a definite bias towards practical application of mechatronics and machine vision systems. The papers covered a broad range of fields including: education, biomedical, robotics, UAV's, mining, agriculture and manufacturing. One of the more prominent papers was on the world's first autonomous surgical robot applied in practice (a robotic micro-drill used for cochleostomy operations).

The international conference attracted delegates from around the world including such places as: Hong Kong, Korea, Japan, Spain, Sultanate of Oman, USA, UK, IRAQ and Malaysia. There was an even split on papers with around half from Australia and half from overseas.

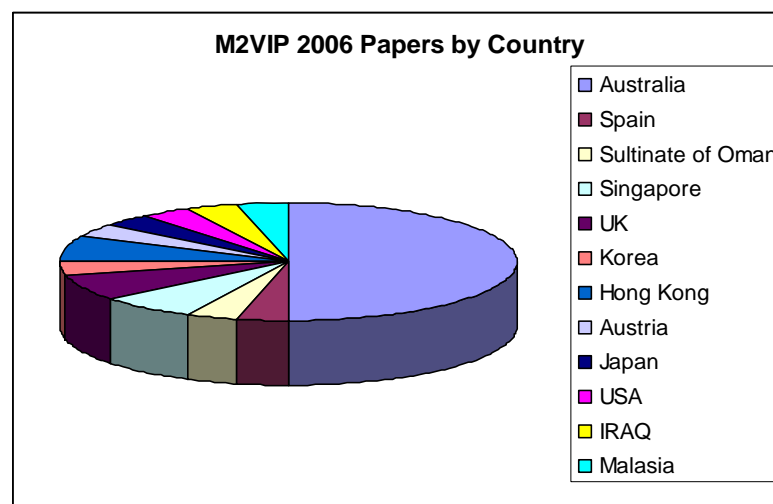


Figure 4 Paper location distribution for the 13th Mechatronics and Machine Vision in Practice symposium 2006

PhD Students in Signals & Systems Workshop

The 2007 PhD Students in Signals and Systems Workshop was held at the University of Melbourne on the 12th and 13th of April. The workshop was sponsored by the ARC network on Intelligent Sensors, Sensor Networks and Information Processing. The objective of the

workshop was to provide an opportunity for students to present their work to academics and fellow students. A total of 28 papers were presented from a number of Universities as illustrated in Figure 5. Students were allowed a total of 25 minutes (including question time) for each presentation. The topics that were covered included: Bio-medical applications, Networked Control Systems, Estimation & Control, Nonlinear Control, Signal Processing & Telecommunications and Optimisation & Numerical methods.

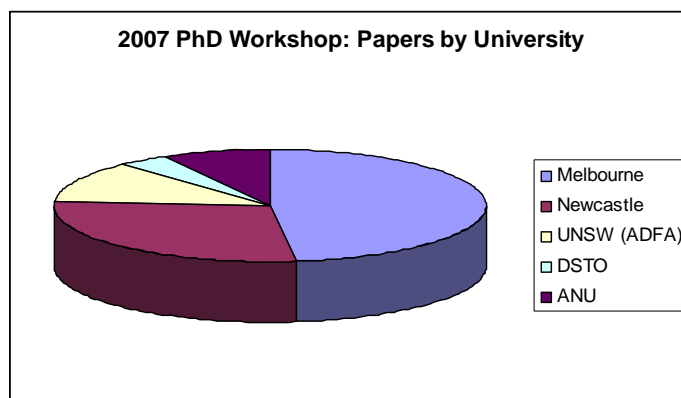


Figure 5 Papers presented at the 2007 PhD Student in signals & Systems Workshop

The organisers, under the auspices of the ARC network on Intelligent Sensors, Sensor Networks and Information Processing, want to achieve a greater participation of the PhD students in the area of Signals and Systems across Australia in this workshop and are seeking expressions of interest to participate in the next edition of the workshop. Please contact ncaci@engineersaustralia.org.au The workshop provides ample opportunities to build personal networks with other students and academics in the area, in a friendly and co-operative manner. Students receive friendly and encouraging feedback on their work, and in general find the experience extremely rewarding.

IFAC – PapersOnLine

On the 15th of January 2007 Wook Hyun Kwon the president of the International Federation of Automatic Control (IFAC) announced that the IFAC publications will go fully electronic starting mid 2007. Papers from IFAC Conferences, Congresses, symposium and workshops will be accessible from the website without cost to the readers. This is being done in conjunction with Elsevier (the IFAC publisher) and is expected to be one of the most important features for IFAC in the future. The website is IFAC_PapersOnLine.net

Upcoming conferences

Further conference information is available on the EA website at:

<http://www.engineersaustralia.org.au/ncaci>

Committee Membership

Call for volunteers for the NCACI committee (particularly from instrumentation & biotechnology). Please forward expressions of interest to Prof. Iven Mareels (NCACI Chair) email: i.mareels@unimelb.edu.au

Editor's Post-script

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