A C I newsletter

Electrical College

Chairman
Clive Cooper

The Institution of Engineers, Australia

National Committee on Automation, Control and Instrumentation
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## Inside this edition



# A Merger of Process Control Society and the National Committee for Automation, Control and Instrumentation into A New Society in Automation, Control and Instrumentation

**For more details see page 5 and please reply by 31/1/98.**

## NCACI Committee Member Profile

**Peter Stone** is a practicing Process Control Engineer with graduate qualifications in Mechanical Engineering and Computing from Melbourne University.

Since graduating in 1981, he has worked for BHP Research in various capacities. Initially, he was involved in computer modelling the dynamic performance of railroad vehicles used on the permanent way at BHP's iron ore operations in NW Australia. This work focussed on the relationship between bogie assembly tolerances and the consequent rate of wheel and rail wear.

In 1986, he was chosen to lead a strategic project for BHP Research investigating the opportunities for the application of so-called advanced control within BHP's operations. This began a number of strategic liaisons in this area with leading academic practitioners in advanced control from ANU and the University of Newcastle. Over the last 11 years he has been involved in a number of advanced controller applications at BHP's operations, particularly in the Steelworks-these applications have all been model based and range from annealing controllers for stainless steel through to thermal controllers for coke batteries. A constant theme of his technical work has been the application of physically based process models-as structured and non-linear representations of what is known about the process dynamics-in real control systems. He has also maintained an enduring support for the implementation of so-called soft sensors (eg: Kalman filtering and the like) in industrial applications, this being the core of one application of hot steel slab temperature sensing at the Port Kembla Hot Strip Rolling Mill undertaken through BHP's association with the CRC for Robust and Adaptive Systems (CRASys).

Latterly, his research and development interests have tended more to the area of Model Based Predictive Control (MPC) in its various guises-he hopes that the real gains already made in the petroleum refining and chemical industries through the application of commercially available MPC technologies can be replicated in the steel and minerals processing industries.

Currently, he is a Principal Research Engineer at BHP Research's Melbourne Laboratories and is a team member involved in implementing a number of control and instrumentation projects for BHP's Operating Divisions. For the past 5 years, he has been active in the NCACI and as Chairman in the last two years has overseen a number of initiatives begun by his predecessor (Prof Brian Speedy) as well as guided the Committee towards a logical amalgamation with the Process Control Society. He warmly thanks the NCACI for their support during his tenure and wishes Nigel Hancock and Ljubisa Vlacic, the new Chair and Deputy respectively, all the best in the exciting times ahead.

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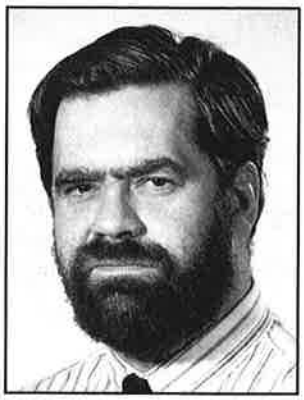

**Nigel Hancock** is currently Associate Professor in Instrumentation in the Faculty of Engineering and Surveying at the University of Southern Queensland in Toowoomba. He emigrated to Australia seventeen years ago with a background in military avionics, atmospheric science and instrumentation.

Nigel was initially trained in a blend of engineering and physics: an Honours degree in physics from the University of Manchester was wrapped in a five-year cadetship with Marconi Space and Defence Systems Ltd, UK. The cadetship provided experience ranging from microwave engineering to servo systems, and from component design to flight simulation. And after indulging a passion for travel in the Middle East and Asia during 1971/72 he returned to the Guided Weapons Division of Marconi and later specialised in trials engineering of prototype systems.

From these roots an interest in instrumentation and measurement developed and Nigel moved sideways to undertake research in instrumentation for micrometeorology. Military engineering techniques proved essential to ensure the survival of unattended electronic systems in the upland forests of mid-Wales and he received a PhD from the University of Strathclyde for the measurement of a variable - the amount of water stored on a forest canopy - not previously measured directly, but important to the successful water catchment management of the region.

This research had awakened an interest in university teaching. Nigel accepted a two-year post lecturing and undertaking post-doctoral work at Paisley University, Scotland. Encouraged by Margaret Thatcher's higher education policies he emigrated to Australia in 1981 to lecture in electronics and microprocessors at the Darling Downs Institute of Advanced Education in Toowoomba (which has evolved into the University of Southern Queensland). With the aid of the newly-available 8-bit microprocessors he developed teaching research work in the application of electronics to agriculture, with a heavy emphasis on systems which would actually stay serviceable in the field. Again measurement and data acquisition problems were of particular interest and areas of application included flood/erosion monitoring, tractor and tillage equipment performance, grain flow, sugar cane harvesting losses, evaporation and soil moisture monitoring, and glasshouse management. Recent and current work includes feedlot and piggery odour assessment, dairy instrumentation, abattoir automation and low-cost gas sensing.

Nigel undertook sabbatical leave with the University of South Australia to further an interest in the theoretical bases behind instrumentation and measurement, the group of subjects usually labeled 'measurement science', and particularly how these unifying ideas might be appropriately incorporated in the modern engineering curriculum where the competition for space is intense. Subsequent initiatives in coursework have included specific instrumentation electronics, the successful introduction of automatic test equipment design experience at undergraduate level, and also a final-year option study 'Measurement Science and Instrument Engineering'. The need to move away from the traditional first-year 'recipe' approach to the solution of measurement problems remains a personal hobby-horse!

Currently Nigel has the principal responsibility for BEng/BSurv project work at the Faculty of Engineering and Surveying, USQ, (managed cross-faculty) and is also Chair of the Faculty Academic Board. He is the Australian member of the Editorial Board of the journal Computers and Electronics in Agriculture (Elsevier).

Nigel joined the NCACI in 1990 and has had responsibility for the sounding of the opinions and expectations of the 'ACI constituency' (i.e. the readers of this Newsletter). More recently he has been responsible the establishment and administration of the annual Undergraduate Thesis Prize in ACI. Current interests include the possible formation of an ACI Society.

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## A New NCACI Chairman Elected

On its last meeting held in Sydney at Control '97, NCACI elected Dr Nigel Hancock of University of Southern Queensland, to take over the chairmanship of the Committee for the next two years.

Since late 1995, NCACI was successfully chaired by Peter Stone of BHP who has shown both an incredible enthusiasm and high managing skills in guiding the Committee towards putting in place a number of initiatives begun by his predecessor (Prof Brian Speedy). A recent NCACI's initiative on an amalgamation with the Process Control Society has received Peter's full support and his personal engagement.

The Committee welcomes Nigel as the incoming Chairman and looks forward to an inspiring term under his leadership.

# The Inaugural NCACI National Project Excellence Awards: Announcement and Presentation

Professor Mike Brisk presented the inaugural IEAust Project Excellence Awards in ACI (Automation Control and Instrumentation) at the IEAust CONTROL '97 conference dinner held in Sydney, on 21 Oct 97. The Project Excellence Awards recognise outstanding applications of ACI, and the awards are designed to encourage the application of 'best practice' ACI techniques to achieve greater productivity, more efficient use of resources including energy, and reduced emissions.

The inaugural prize winners were PCT, Perth, for their work on Stage 1 of the ERA Ranger Uranium Mine plant upgrade, and BHP Engineering and BHP Coated Steel, jointly, for the Springhill Coil Packaging and Handling Project, Port Kembla. CSR Timber Products work at the Oberon Production Facility, and CAMMS Automation's upgrade of the National Dairies plant in Adelaide, were highly commended.

PCT's design and management of Stage 1 of the automation upgrade at the ERA Ranger Uranium Mine is the first step in a planned $40M expansion of Ranger to increase milling capacity by 50%. In making this award the Committee acknowledges the outstanding success of this Project in delivering measurable value to the customer, ERA Ranger. Savings in excess of $1.3M beyond the planned benefits have already been delivered. The success of this project demonstrates the gains available to industries undertaking control and automation upgrades of this type.

The award for the Springhill Project recognizes excellence in the design and management of automation and computing systems to manage the new steel-coil handling and packaging facilities provided by the Project, and to integrate the new facilities with existing supervisory controls and information systems at the site. The project includes controls for a new Packaging Line and 16 Automatic Guided Vehicles, a Supervisory Control computer for the steel-coil Finishing Process, and a computerized Coil Management System ("CMS"). The CMS communicates with nine existing supervisory computers and with the "OTIS" management information system. A post-implementation review has demonstrated that the automation investment (valued at approximately $4million) was well warranted.

CAMMS, Automation and Electrical Services, redesigned and replaced the entire control system at National Dairies, Mile End plant, Adelaide with complete adherence to ISO 9001 quality procedures. More than $1M was invested in this state of the art upgrade, which is the first of its type for National Dairies in 14 years and will ensure a more efficient business operation in an industry where quality incidents and significant downtime are unacceptable. The integration of the new computerised system was achieved by progressive 'on-line changeover' which resulted in negligible lost production time.

CSR Timber Products , together with System Control Services, has designed and implemented a fully integrated process control and business systems computer network, at CSR's Oberon Production Facility. The $15M control component, the "Oberon Network", of a much larger investment is based on the requirement for a true open architecture, a single network without gateways, using ethernet communication throughout. Fire protection systems, weighbridge electronics, and various proprietary control systems are all serially linked to their local PLCs and their data made accessible to the rest of the network. Specific innovations include a weighbridge transaction and data transfer system based on smart card technology, and the design of a boiler control strategy which eliminates valves.

L-R Prof. Mike Brisk, Monash University, Bruce Phillips, PCT (winner), Michael Comensoli, BHP Coated Steel and Stephen Roch, BHP Engineering (joint project winner), Dr Michael Evans, DSTO.

The committee was delighted by the number and quality of the projects submitted and the scale of the investment being made in advanced control. It was a very encouraging start to a new award program sponsored by the NCACI, and I would like to take the opportunity to thank my fellow selection Committee members, Dr Peter Stone (Melbourne) and Dr Steve Lieblich (Perth) for their considerable efforts.

Dr Michael Evans
Chairman
NCACI National Project Excellence
Award Committee

## PRIZE to be Won !!!!!!!!!!

**All replies will be eligible to win a book voucher to the value of $150 at EA Books. The winner will be notified by IE Aust by 28.02.98.**

FaxBack Form: Please fax to Trish Grice, at the Institution of Engineers, Australia on **02 6273 2358** by 31.01.98

Name: _____

Home Address: _____

_____

Business Address: _____

_____

Phone (bus)_____ (home) _____ (fax) _____

Email address (if applicable): _____

Member of IE Aust: Yes/No

Area of Practice: (Automation/Control/Instrumentation/Other (specify))

_____

I am/am not interested in becoming a member of a new Society in Automation, Control and Instrumentation.

New Society services, or potential services you would be interested in:

_____

_____

Comment: (role of Society, ideas,.....)

_____

_____

_____

_____

# A New Society in Automation, Control and Instrumentation

## *Are YOU interested in Becoming a Member?*

A new Society is being proposed to meet the needs of engineers, engineering technologists and other practitioners in the fields of automation, control and instrumentation (ACI). This will be a National Society operating within the IE Aust Technical Society system and will provide a range of services which promote and foster the practice of ACI in Australia, overcoming the traditional demarcations in formal disciplines (eg, electrical, chemical or mechanical) and enabling all practitioners in ACI—independent of their formal qualifications and IE Aust membership status—to jointly further their technical development, network with their peers and share experiences.

For many years, the principal IE Aust body responsible for providing National member services in the ACI area has been the National Committee for Automation, Control and Instrumentation (NCACI). This Committee is less than optimally structured for meeting the regional needs of many IE Aust members and has recently reassessed its role in delivering 'grass roots' services to its constituency. In view of the success of the IE Aust's Process Control Society since its founding in 1988, and the broad intersection of interests of the PCS members and the NCACI constituency, the two organisations have begun negotiations to merge into a new Society to provide service to and promote the interests of all practitioners in Automation, Control and Instrumentation. It is intended that, contingent on the support of existing PCS members and if sufficient enthusiasm is evident in the NCACI constituency, the new Society will be formally convened early in the 1998 calender year. It is hoped the new Society will perform functions that are a natural merge of the existing roles of the NCACI and PCS.

This is an invitation for you to express interest in becoming a member of this new Society. Please let us know what you think about this proposal by filling in the faxback cutout below and faxing it to us.

Our two organizations are very excited about the potential of such a Society and we hope that you will join us in the journey.

John Lear
Chairperson PCS

Peter Stone
Chairperson NCACI

**Existing**
**National Committee for Automation, Control and Instrumentation (NCACI)**

Membership Cost
- Nil - Service provided as part of annual IE Aust Membership Subs

Services
- Hold national conferences in ACI and publish papers.
- Publish newsletter in ACI.
- Encourage engineers to publish papers on ACI issues.
- Encourage research and development in the ACI field.
- Conduct studies of national issues in ACI
- Maintain formal links with other national and international bodies in the ACI field.
- Propose matters on which public statements form the IE Aust on ACI matters are advisable and prepare draft statements.
- Recommend nominees for appointments to other Committees (eg: Standards Aust) in ACI related areas.
- Participate in the preparation of national codes of practice in ACI
- Promote excellence in the practice of ACI engineering.
- Promote student and academic interest in ACI

**Existing**
**Process Control Society (PCS)**

Membership Cost
- $15 per annum for IE Aust members, $25 per annum for all other members

Services
- Organise meetings, conferences and seminars in Process Control related subjects
- Invite and arrange eminent speakers to address Technical Society gatherings on in Process Control issues.
- Organise the development of and dissemination of expert practice based opinion and advice in Process Control
- Provide a single link with other organisations in the ACI forum (eg: IChemE,IICA, Cooperative Research Centres, Universities)
- Encourage the production and publication of learned papers in in Process Control theory and practice
- Establish electronic forua for the exchange of information between the diverse practitioners in the in Process Control area.

**Enlarged Society for Automation, Control and Instrumentation**

Membership Cost
- $15 per annum for IE Aust members, $25 per annum for all other members. Existing PCS members will have their membership automatically transferred.

Services
- Encourage interaction and discussion between practitioners of the three major areas—Automation, Control and Instrumentation
- Organise meetings, regional and national conferences and seminars in ACI
- Invite and arrange eminent speakers to address Technical Society gatherings on ACI issues.
- Conduct studies of national issues in ACI
- Organise the development of and dissemination of expert practice based opinion and advice in ACI
- Provide a single link with other national and international organisations in the ACI forum (eg:IFAC, IMEKO, MSA, IEEE, IEE, IChemE, IICA, Cooperative Research Centres, Universities)
- Encourage the production and publication of learned papers in ACI theory and practice
- Establish electronic forua for the exchange of information between the diverse practitioners in the ACI area.
- Recommend nominees for appointments to other Committees (eg: Standards Aust) in ACI related areas.
- Participate in the preparation of national codes of practice in ACI
- Publish newsletter in ACI.
- Promote excellence in the practice of ACI engineering.

# The 1997 Australian Control Conference - Control'97

## Control 97: Bringing Together Industrial & Theoretical Control Advances.

The Control 97 conference was held in Sydney from 20 to 22 October 1997. The conference was well attended with 186 delegates. There were approximately equal numbers of academic and industrial attendees, with an equal split between applications and theoretical presentations.

Each day started with a powerful plenary presentation. Guy Dumont, from the University of British Columbia, kicked off the conference with a challenging insight into advanced control and paper manufacture. Day two saw Dave Smith of DuPont, share his vision of successful process control, the constraints limiting improvement and some surprising research areas. The final plenary, by Petar Kokotovic of the University of California, was a world class presentation on the theory of nonlinear control. (This had the academics taking notes throughout.)

The standard of presentations throughout the entire conference was very high, and all presenters should be proud of their efforts.

Other highlights include the Cocktail Party (very effective networking), the Conference Dinner (successful presentation of the Project Excellence and Thesis Prizes plus great entertainment from Karl Kruszelnicki), the tutorial sessions and the poster display.

The conference finished up with two special sessions. The first was sponsored by the Process Control Society, presenting Process Control benchmarking results with a lively discussion on how to improve our performance. The final session was an enlightening and entertaining presentation by Professor Graham Goodwin on the success of multivariable control. On reflection, Control 97 provided a great forum for those people in Australia working in control; theory, applications, networking and fun.

Dr John B Lear
Chairman, Process Control Society
ICI Australia Engineering


# The NCACI Undergraduate Thesis Prize 1996 Awarded

The winners of the NCACI Under-graduate Thesis Prize for 1996, Kim Bentley and Chris Leigh-Lancaster, were presented with their Medals, Certificates and a cheque for $500 each at a brief ceremony at the Conference dinner of Control '97. Prof Mike Brisk presented the awards at the dinner on Tuesday 21st October at the Novotel, Brighton Beach, Sydney. The seven runners-up, Kynan Eng, Alec Robertson, Matthew Hollingworth, Kiew Kam, Julio Rodriguez, Cameron Snoek, and Christofo Torrisi, whose theses were also considered prizeworthy, were also commended at the ceremony. 1996 is the first year in which the assessment panel had been unable to split the two leading prizeworthy applicants and hence the cash prize was divided.

Applications for the 1997 ACI Thesis Prize will be accepted up to 15th December and details of eligibility, application forms, etc., are available from Trish Grice at Engineering House, 11 National Circuit, Barton, ACT 2600 (ph. 02 6270 6548).

Nigel Hancock,
Chair, ACI Thesis Prize Assessment Panel

**Editors' Post-script**

- **Discussion Forum:** Letters to the editors in response to any article in the newsletter will have the responses published in subsequent editions.
- **News of interest** to the Australian community of control engineers are most welcome.
- **A special issue** of the newsletter may also be worthwhile. Please submit a proposal.
- **Contributions** will be reviewed against the Mission Statement of the Committee when editing received material. The editors reserve the right to make changes.
- **Your calls** are always welcome.
  The Editors: Dr Ljubo Vlacic (ph: 07 3875 5024; e-mail: L.Vlacic@me.gu.edu.au) and Ms Trish Grice (ph: 06 270 6548; e-mail: trish_grice@ieaust.org.au).

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