

ACI newsletter

National Committee on Automation, Control and Instrumentation
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Towards a New 'ACI Society'

First Update

Things have been moving towards the formation of this new society as proposed in the last ACI Newsletter (December 1997), albeit not as rapidly as we would wish. As set out in the last newsletter the concept is essentially a coalescence of the present National Committee (NCACI) and the existing Process Control Society (PCS) with the principal objective of providing better service to members. (* The name of the new society has not yet been finalised and will be a matter for the membership - 'ACI Society' is simply a working title.)

If you missed this announcement and would like a copy of the proposal please contact Trish Grice at IEAust, telephone (02 6270 6548), fax (02 6273 2358).
email (tgrice@eol.ieaust.org.au)

Constitution within the Institution of Engineers, Australia

The coalescence of an existing society and a separate national committee within the IEAust is unique. There is no precedent as to how this should occur and hence we are looking at appropriate structures and mechanisms within the Institution to effect this change for the maximum benefit of potential members. Obviously it is critical that existing activities and services in both bodies are not jeopardised by the change. This situation is potentially

complicated by aspects of reorganisation which will follow the establishment of the National Congress earlier this year.

The two bodies are fundamentally different in nature. As a society, the PCS is a 'grass roots' organisation with the major collective interest in 'doing process control better'. It is member-driven and self-supporting.

In contrast, the NCACI has a rather wider role in encouraging, supporting and representing the discipline of ACI at a national level. As a national committee of the IEAust, the NCACI enjoys substantial administrative services which are critical to the execution of its responsibilities and running of its activities. In addition to representing ACI interests within, and on behalf of the Institution, there is also the sponsorship of conferences, the biannual ACI Project Excellence Award, the annual ACI Undergraduate Thesis Prize national membership of IFAC and, of course, the ACI Newsletter. The NCACI has a 'constituency' of IEAust members identified annually via their membership subscription.

Matters concerning the continuation of IEAust administrative support when the 'national committee activities' become subsumed within the new society are still under discussion. It is, however, recognised within the Institution that National Committee activities lie outside the normal scope of and function for which societies were originally conceived. Watch this space.

Finally there is also the issue of discipline allegiance. The PCS has roots associated with the Chemical College; the NCACI is constituted within the Electrical College but for obvious reasons also has active interaction with the Mechanical College as well as the Chemical College - such is the nature of ACI. Collectively our identity or allegiance might be estimated as perhaps 30:40:30 (C:E:M) respectively, but we would probably all have differing perspectives on these numbers. In discussions we have experienced goodwill from all sides in this regard such that we foresee no significant problems arising from our cross-disciplinary nature. However from an administrative point of view, discipline allegiance is preferred and it is proposed that the new 'ACI Society' will be constituted within the Electrical College. The rationale for this is firstly NCACI history; and secondly, and more importantly, the fact that the central enabling technology for modern ACI is generally recognised as 'electrical'.

Such is the progress, and lack of it, to date. Your thoughts on any of this are most welcome.

Nigel Hancock, Chair, NCACI
(hancockn@usq.edu.au)

John Lear, Chair, PCS (JBL2@orica.com.au)

Collation of the 'Faxback' Responses from the NCACI and PCS Newsletters, November 1997:

The 'Are You Interested?' Faxback

72 respondents (out of 75 responses) were supportive or very supportive. A collation of these responses was prepared for the last NCACI meeting (April 1998) and is reproduced below.

While this faxback was certainly not designed to be a comprehensive survey, the National Committee was encouraged by the enthusiasm shown for the proposal, - but we do hope there are substantially more than 72 interested participants 'out there'! Of particular note perhaps is the breadth of interest, which tends to reinforce our view that a vital feature, and therefore an important function of the new society, is the integration of Automation and Control and Instrumentation.

Congratulations to Stephen Vigh of CSR, Ingham, Qld., who was the lucky winner of the \$150 EA Books voucher. Commiserations to the other 74 respondents, and particularly to Andrew Skinner of Magill, SA, whose annotation of his fax: "p.s. I love books!" did not appear to bring him any extra luck when the winner was drawn from the hat.

RESPONSE TOTAL = 75

Comprising:

- supportive/potential members = 72
- not interested = 3 (each indicating retirement/resignation/removal from mailing list)

Of the 72 supportive:

I E Aust MEMBERSHIP Yes = 57 No = 15

AREAS OF PRACTICE

ACI = 16; AC = 9; CI = 11; AI = 1; A = 6; C = 13; I = 7 (= 63 in total)

Other = 18 in total:

- alone = 9;
- in conjunction with one of the above = 18;

Areas stated as:

drives/motors = 1 power ind. = 2

RESPONSE TABLE

R & D = 1	metrology = 1
food ind. = 1	chemical ind. = 3
education = 2	SCADA/telemetry = 1
industrial eng. = 1	information technology = 1
project management = 1	medical instrumentation = 1

NEW SERVICES / SERVICES OF INTEREST:

Comment:

Some responses interpreted this 'additional' and wrote (e.g.) "as listed". Others have listed what they were personally interested in. This analysis does not try to distinguish the two interperations.

Conferences = 10 in total

- | | |
|--|------------------------------------|
| ◆ (" regional" = 2; " international " = 2) | ◆ case studies = 4 |
| ◆ publications = 4 | ◆ PLC control = 1 |
| ◆ motor control/drives = 2 | ◆ technical papers = 2 |
| ◆ meetings = 6 | ◆ vendor presentations = 3 |
| ◆ worlds best practice = 4 | ◆ workshops = 2 |
| ◆ seminars = 10 | ◆ R & D / university research = 5 |
| ◆ site / industry visits = 3 | |
| ◆ education - introductory = 2 | |
| ◆ education - paraprofessional = 1 | |
| ◆ education - continuing = 1 | |
| ◆ radiation applications = 1 | ◆ nuclear industry = 1 |
| ◆ mineral exploration = 1 | ◆ information library services = 1 |
| ◆ standards (for Australia) = 3 | ◆ "dial help" = 1 |
| ◆ electronic data exchange = 7 | ◆ website = 3 |
| ◆ email = 9 | ◆ networking = 2 |
| ◆ news / newsletter = 6 | ◆ awards = 1 |
| ◆ job market info = 3 | ◆ occ. health & safety issues = 1 |
| ◆ forum for instrumentation developers = 1 | ◆ breakfast events = 1 |

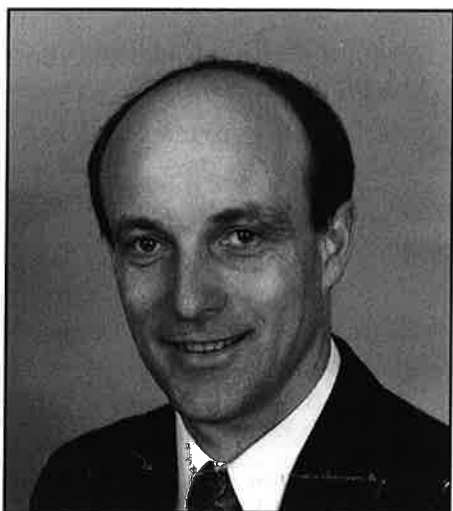
COMMENT (ROLE OF SOCIETY, IDEAS,)

(= 1 each unless indicated otherwise)

- ◆ amalgamation an excellent idea (= 5)
- ◆ the main qualification should be enthusiasm
- ◆ critical mass / community too small for separate organisations (= 2)
- ◆ remember tech staff (other than BEng-qualified) (= 2)
- ◆ form 'sub-society' in New Zealand
- ◆ ink to Singapore group
- ◆ committee to have cross-section vendors / consulting / contracting / academic
- ◆ do not overemphasise the academic
- ◆ need 85% industry / 15% academic
- ◆ must be wider than process control / instrumentation
- ◆ stronger links with the IICA (= 3)
- ◆ stronger links to Metrology Soc Aust (= 2)
- ◆ stronger Asian links (= 2)
- ◆ promote ACI to members & students & public (= 2)
- ◆ use of Internet to overcome geographic separations
- ◆ maintain the control aspects at a high level
- ◆ promote advanced process control
- ◆ preserve "grass roots" style of PCS
- ◆ balance local focus & international focus
- ◆ provide wider exposure for control professionals
- ◆ pursue engineers in the utility industries, especially electricity, water/waste water
- ◆ how to adequately service non-capital-city members ?
- ◆ encourage good engineering practice
- ◆ encourage the sharing of knowledge

Dr Nigel Hancock 16 March 1998

NCACI Committee Member Profile



John Lear is a Control and Modelling Specialist with Orica (formerly ICIAustralia). He has a BE (Chem) and PhD in Advanced Process Control from the University of Sydney. His professional interests are in achieving improvements through best practice process control and doing it safely. He is also the Chairman of the Process Control Society.

Now, this little column could be a little on the boring side, so instead of a bland list of glorious achievements (conveniently neglecting any disasters), a more amusing account will be substituted.

Highlights:

A Chemical Engineering traineeship at BHP Port Kembla. A great place for a young person interested in technology to be part of it in a big way. Somehow achieving great results in my first degree and studying for and receiving my PhD (The Effect of Uncertainty on the Economics of Optimising Control). Managing to keep a FOX 2/30 Process Control Computer (with 32k of core memory, a 1MB C-MOS disk emulator, paper tape, Assembler operating system) running well past its used by date. Improving the safety and operability of numerous control applications through the development (with others) of the CHAZOP review technique. Being part of the first PID H-infinity controller industrial application in the

world (with Sydney Uni), and that it is still working perfectly after 6 years. Performing numerous dynamic simulations for troubleshooting and controller design and finding they actually matched plant behaviour. The success of the Control 97 conference.

Lowlights:

As a trainee at BHP, you tended to learn by your mistakes and I had my share. It took me over 6 years to finish my PhD (part-time and full -time). Feeding thousands of metres of paper tape through a reader. My first attempt at tuning a controller (open-loop unstable temperature control of an exothermic polymerisation reactor). Yes I tripped the plant. Being part of a CHAZOP which lasted for 8 months. Even though the final system worked first go. Doing the plant trials to identify the model for the H-infinity controller, and frequently sending the product off-specification. Finding out the hard way that the instability in a dynamic simulation wasn't a numerical problem.

John can be contacted at:

Ph: 02 9352 2815

e-mail: JBL2@orica.com.au



Sam Crisafulli was born in Ingham, a small North Queensland coastal town in a sugar cane growing region just north of Townsville. He grew up on a sugar cane farm where he developed an interest for technical things due to his exposure to tractors, trucks, cane harvesters, motor bikes, cars and other farm equipment. Being the son of Italian migrant farmers, he

was strongly encouraged by his parents to pursue an alternate career to farming, obtain an apprenticeship, and become a tradesman motor mechanic. As there were no motor mechanic apprenticeships available at the local CSR sugar mill the year he applied, he settled for an apprenticeship in Instrument Fitting, which was to set the direction for his career in Control Engineering.

After finishing his apprenticeship in 1984 and working for a while as an Instrument Technician, he was admitted to a Bachelor of Engineering (Electrical and Electronic) degree at James Cook University of North Queensland on a provisional entry due to his poor tertiary entrance score. Upon graduating with Class I Honours in 1989, he commenced a Doctor of Philosophy (PhD) degree at The Australian National University in the field of Systems Engineering. When he graduated from his PhD in 1992, he commenced a position with the Cooperative Research Centre for Robust and Adaptive Systems (CRASys) in Canberra as a Research Engineer, later being promoted to Senior Research Engineer. During this time he worked on numerous control research and consulting projects in a diverse range of industries including Steel, Sugar, Mining, Aerospace and Telecommunications. He also spent three months at the Pulp and PaperCentre, University of British Columbia, Canada as part of an Australian Federal Government Science and Technology Awareness Program Scholarship to undertake an overseas study program.

In 1995, Sam moved to Newcastle where he commenced a new position as Engineering Manager of CICS Automation, a division of the University of Newcastle's commercial company, TUNRA Limited. His principal responsibility during this period was to lead the research commercialisation effort of the university's advanced control software product, UNAC. In addition, he played a key role in developing a number of industrial control courses that were presented in Australia and overseas along with research and consulting in process control.

In 1997, an independent company was spun-off from the university with the mission of providing world-class solutions to process control problems through its range of innovative advanced control products and services. Sam was appointed as Managing Director and CEO of this company, CICS Automation Pty Ltd. Although management and business development occupies most of his time these days, he still continues to maintain an active technical role in consulting and UNAC product R&D.

Dr Crisafulli has authored and co-authored in excess of forty journal and conference papers, is a Fellow of the Institution of Engineers, Australia, a Member of the Australian Institute of Company Directors, a Member of the Australian Institute of Management and a registered Chartered Professional Engineer. He has been a member of the National Committee for Automation Control and Instrumentation since 1995 and Chairman of the Undergraduate Thesis Prize sub-committee since 1997. He was a member of the Control-97 conference organising committee during 1995-97.

On the personal side of things, he enjoys walking (particularly bush walking), the beach in summer, red wine, beer and good food. His favourite TV shows are Star Trek and Seinfeld and occasionally (it's taken him many years to come out with this one!) Melrose Place. His favourite movie - Pulp Fiction, favourite actor - Arnold Schwarzenegger, favourite music type - blues, favourite musician - Johnny Winter. He is married to Lisa, a Graphic Designer, who is slowly inculcating him with some artistic right-side-brain notions.

Sam can be contacted at:
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The 1997 Undergraduate Thesis Prize - Award Announcement

Comprising a Medal, a Certificate and a cheque for \$1000

The winner of the 1997 prize has finally been determined.

Comparison of theses and projects is always difficult considering the range of Automation, Control and Instrumentation applications and with due regard to the different amounts of effort students can afford to devote to their project in competition with other subjects in their final-year. However in this, only its third year of operation, the Assessment Panel found no less than six prize-worthy theses. The Panel comprises six members of the National Committee including two from academia and four from industry.

The winner is: **James Welsh**, for the thesis entitled:

“Auto Tuner for PID Controllers”, Department of Electrical and Computer Engineering, Centre for Integrated Dynamics and Control, University of Newcastle, under the supervision of Prof. Graham Goodwin.

The thesis involved the development of novel PID auto tuning techniques that work automatically and robustly on a very wide range of applications encountered in industry and with very minimal disturbance to the plant's steady state conditions. The project included the development of new fundamental theory and complex real-time software and hardware development. James is currently continuing this work as part of his PhD research, and is tackling the extensions for the multiple-input/multiple-output plant situation.

Recipients of Certificates of Commendation are (in alphabetical order):

Mark Cowlshaw, “Dynamic Modelling of a High Speed Vehicle for Location Estimation”, (Department of Mechanical and Mechatronic

Engineering, University of Sydney)

Ivan D’Cruz, “Quay-Crane Systems Enhancement Auto Pick and Place”, (Department of Mechanical and Mechatronic Engineering, University of Sydney);

Paul Golding, “A General-Purpose Electronic Instrumentation System for Science and Engineering”, (Department of Electronics and Communications Engineering, University of Canberra);

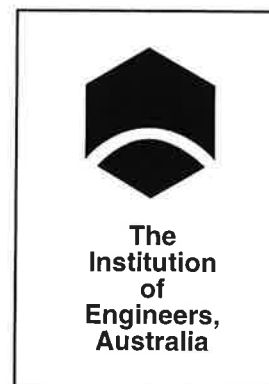
Carly Hart, “Wrist Stabilisation during Stimulated Hand Grasp of Spinal Cord Injured Persons with Tetraplegia”, (Department of Electrical Engineering, University of Sydney in conjunction with the Biomedical Engineering Unit, Royal North Shore Hospital, Sydney);

James Lennox, “Analysis and Control of the Anaerobic Section of the BNR Process”, (Department of Chemical Engineering, University of Queensland);

Presentation of these awards will take place at the M.A. Sargent award presentation in Perth in July.

Applications for the 1998 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

Sam Crisafulli,
Chairman, ACI Thesis Prize Assessment Panel



Conference Announcement: Information, Decision and Control - IDC 99

The DSTO sponsored event Information, Decision and Control 99. It comprises three symposia: Data and Information Fusion, Signal Processing and Communications, Decision and Control, and will be held in Adelaide in February 1999. Extended abstracts are due by June 30 1998.

For the details, please contact the address as follows:

<http://idc99.cssip.edu.au>
<http://www.IDC99.gmu.edu>
(USA mirror site)
or

by contacting the IDC-99 Secretariat electronically at plevin@camtech.net.au or in writing at IDC-99, Plevin & Associates Pty Ltd, PO Box 54, Burnside, SA 5066, Australia.

IDC-99 will bring together scientists, engineers and mathematicians working across the disciplines of signal processing and communications, decision and control, and data and information fusion. Progress in these disciplines is critical to the successful implementation of large interconnected and distributed systems such as military C3I systems, communication networks, distributed sensor networks, and large scale distributed control systems.

IDC-99 is structured along the lines of similar multi-conferences held over recent years around the world. It is planned to provide a technically strong symposia for each of the three core disciplines, and in addition there will be significant opportunity for overlap and interaction between the various groups.

The IDC-99 Organising Committee invites researchers and practitioners in academia,

industry and government to submit extended abstracts of papers for one or more of the three symposia of IDC-99 as detailed below. Acceptance for presentation in oral and poster sessions will be based on review by the program committee. All submissions will be reviewed on their originality, relevance, significance and clarity. Only presented papers and posters will be published in the IDC-99 Proceedings.

Topics:

Problem Domains: Tracking, Multisensor Fusion, Situation Assessment, Threat Assessment, Sensor Control and Management, Fault Detection. Underpinning Technologies: Estimation and Inference, Decision Theory, Game Theory, Artificial Intelligence, Information Theory, Bayesian Networks, Distributed Systems, Control. Application Areas: Aerospace and Automotive, Civilian and Military Surveillance, C3I and Information Warfare, Condition Monitoring, Medical, Robotics. System Design Issues: Frameworks, Performance Assessment, Designable Systems, Robustness.

Statistical Signal Processing, Spectrum Analysis and Estimation, Digital Filter Design and Implementation, Fast Algorithms, Underwater Acoustic Signal Processing, Detection Theory, System Identification, System Optimisation, Parameter Estimation, Adaptive Signal Processing, Robust Signal Processing, Signal Processing for Communications Systems, Communications Networks, Discrete Event Systems, Mechanical Systems Signal Processing, Image Processing and Analysis, Speech Processing and Analysis, Applications of Signal Processing Techniques.

Distributed Decision-Making Processes, Distributed Control, Adaptive Systems, Optimization, Intelligent Control, Nonlinear Control, Industrial Automation, Command Control and Communication (C3), Hybrid Dynamical Systems, Distributed Detection /Decision, Robust Control, Discrete Event Systems, Petri-Nets, Artificial Intelligence.

National Project Excellence Awards in Automation, Control and Instrumentation

The objective of the National Project Excellence Awards is to reward achievement, promote even better engineering, show the community how good engineering creates wealth and improves living standards and to encourage the best young people to join the profession. In particular, these awards are designed to encourage applications in ACI which are cost effective, commercially viable and provide benefits to the Australian economy.

This Award, which is focussed on recognising prominent project successes in the AC or I fields, is an integral part of the Institution's drive to raise the visibility of engineers and their considerable achievements in the general community and as such the Award is well publicised and the ultimate winner will be assured of gaining considerable exposure in the general media.

For more information or a copy of the regulations please contact Trish Grice on 02 6270 6548

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:

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