



Electrical College

Chairman  
Alex Baitech

# ACI NEWSLETTER

National Committee on  
Automation, Control & Instrumentation

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## INTRODUCTION

In this issue we continue our focus on ACI related CRCs, taking a look at the CRC for Intelligent Manufacturing Systems.

We also remind readers of the major Australian control conference of the decade - the 12th World Congress of IFAC being held in Sydney on 18-23 July 1993. This is a never to be repeated opportunity to meet and listen to the foremost Control technologists in the world. The particular focus on control *applications* makes this conference of special relevance to those Australian control engineers working in industry.

On the instrumentation side of ACI, we highlight activities in measurement, test and evaluation - especially the AIM-TEC 94 conference during April 1993.

The Chairman of the NCACI, Brian Speedy, gives more background on NCACI activities - inviting readers to become corresponding members.

## CRC FOR INTELLIGENT MANUFACTURING SYSTEMS AND TECHNOLOGIES

### RESEARCH FOCUS

The mission of the Centre is to research and develop manufacturing systems and technologies that will assist Australian industry in its pursuit of international competitiveness.

The Centre has three research programs: (i) Enterprise Integration; (ii) System Component Technologies; (ii) Shaping and Finishing and Engineering Components.

The focus of the enterprise integration program will be on the integration of manufacturing operations, human resources and information technology at all levels within Australian manufacturing organisations though developments in machine messaging protocols, concurrent engineering, design for manufacture and work cells. The System Component Technologies program seeks to achieve improvements in the productivity, design, flexibility of machine tools and system utilising studies in simulation, control, sensors, networking and signal processing. The Shaping and Finishing program is aimed at the development of a new generation of precision fine finishing equipment together with support technologies such as rapid prototyping to achieve lower cost and higher quality manufactured products.

### CORE PARTICIPANTS

ANCA Pty Ltd; Farley Cutting Systems Australia Pty Ltd; Sunbeam Corporation Ltd; Tyree Holdings (Technical Components Pty Ltd); Convex Computers; CSIRO, Division of Manufacturing Technology; RMIT; Swinbourne University of Technology; University of NSW; University of Wollongong.

### AREA OF RESEARCH EXPERTISE

Manufacturing message protocols, enterprise integration architecture, concurrent engineering, design for manufacture, production simulation and control, sensors, networking, signal processing, cutting and polishing, numerical modelling, rapid prototyping.

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## 12TH IFAC WORLD CONGRESS, SYDNEY, 18-23 JULY

The IFAC World Congress in Sydney in July will be the biggest conference ever organised by the IEAust's AE Conventions. Sponsored by the Electrical College's National Committee on Automation, Control and Instrumentation, the congress will attract in the order of 1,200 delegates to its Darling Harbour venue. 1,600 papers were offered of which 1,200 have been selected.

The technical program will be run in 12 parallel sessions each day starting with a plenary address and papers will be presented in a new and innovative structure. Embedded in the congress will be a number of mini-symposia, target areas and poster sessions in addition to the more usual regular papers.

The sponsors of the congress are BHP, Honeywell, CRA, Rosemount, Siemens, Nucleus, Standards Australia, CSIRO, Mathworks and Integrated Systems.

A full range of technical visits and social programs have been developed for delegates and accompanying persons. The Third Announcement and Advance Program is now available from the Conference Manager, AE Conventions, telephone number (06) 270 6562.

### MISSION STATEMENT OF THE NATIONAL COMMITTEE ON AUTOMATION, CONTROL AND INSTRUMENTATION

Several thousand IEAust members and others with professional interests in automation, control and instrumentation, regularly receive the ACI Newsletter. These engineers form the constituency which the NCACI endeavours to serve.

To provide this service, NCACI operates under a Mission Statement with the following objects.

#### Objective 1

Identify the NCACI Constituency and its views and needs with respect to continuing education, technical support and other services in ACI Engineering.

#### Objective 2

Facilitate improvements in the availability and delivery of continuing education and other support services from the ACI support infrastructure to the NCACI Constituency.

#### Objective 3

Promote improvements in *educational curricula* so that the content and delivery of ACI-related engineering courses in Australia, and prerequisite education, are relevant to the anticipated working environment of their graduates.

#### Objective 4

Promote *Government and industry policies* which ensure that ACI engineering is practiced in Australia by suitable trained engineers using appropriate engineering quality management procedures.

#### Objective 5

Promote research and development in ACI.

#### Objective 6

Promote the *use of ACI* where it can be effectively and ethically applied to improve economic performance, protect the natural environment and/or improve the quality of life in Australia.

These are major objectives. The NCACI welcomes the assistance of ACI engineers in its endeavour to meet them. Becoming a corresponding member of the NCACI committee is one method of helping. Those interested should speak to a committee member or contact the Chairman on (066) 514 722 for details, or write a Letter to the Editor on your views.

Brian Speedy - Chairman

### UNDERGRADUATE EDUCATION IN ACI

In Bachelor of Engineering degree courses the subjects of automation, and certainly control, are frequently, and very appropriately offered at an advanced level. In contrast instrumentation as a subject is often not treated beyond the junior years of the degree. Hence it is perhaps not surprising that many students retain the impression that instrumentation is simply a matter of choosing the right 'recipe' solution from a catalogue.

To redress this misconception and in response to student interest a final-year option study entitled Measurement Science and Instrument Engineering has been offered for the first time at the University of Southern Queensland. Whilst the option is open to all engineering and physical science majors most of the interest and participation came from electrical engineers.

The course adopts the general 'information machine' approach to instrument design and uses particular measures and examples only for case studies. Prerequisite knowledge is deliberately limited to basic engineering physics only, knowledge essential to support the sensor modelling and analysis which forms a large part of the formal lecture material. Consideration of the alternative energy regimes, particularly mechanical, radiative and optical, proved to be quite a novelty for the electrical engineers.

A major design assignment then seeks to combine these ideas with those of signals and systems theory, microprocessor applications, signal processing and communications engineering in the overall design of an instrument or measurement system. As final year electrical engineering students already have most of these skills, complete designs could be (and were) achieved. However, most of the design effort was found to be needed in the sensing systems - this came as a surprise to many of these students.

Specific topics of current and future instrument systems were driven largely by student interest and included smart sensing, fieldbus systems, silicon microsensors, optic fibre sensors and robotic and tactile applications. Discussion of chemical and biological sensors was less successful due to the students' lack of appropriate background knowledge.

Any comments would be most welcome and may be addressed to:

Dr Nigel Hancock  
University of Southern Queensland  
PO Darling Heights  
TOOWOOMBA QLD 4350  
[Or fax (076)-31-2526]

## **AUSTRALIAN CHAPTER OF ITEA ESTABLISHED**

The International Test and Evaluation Association (ITEA) was formed in the United States of America in 1980 to serve all people interested in improving confidence in the safety and predictability of complex systems - such as the accreditation or certification of aircraft, medical systems, air traffic control systems, simulators and models etc.

Few would argue that test and evaluation, by any definition, is a complex field. Operational expertise is essential to understand how a complex system will be used in its intended environment. Test expertise is essential to ensure that the test is adequate and the results properly interpreted. Underpinning all of this are the sensors and control systems that bring life to a system and the measurement tools and techniques needed to evaluate performance.

Founded on the 26th August 1991, an Australian Chapter of ITEA (known as the Southern Cross Chapter) now exists and is the first to be formed in the Southern Hemisphere. In-country, the Chapter is closely co-operating with Government and Industry and holding events aimed at empowering the T&E community. Through its strong overseas ties, potential also exists for Australia to share lessons learned with experienced overseas agencies, participate in co-operative research to improve the economy and safety of testing, and contribute to evolving international testing benchmarks.

Worldwide, T&E resources (test ranges, telemetry, EMC testing etc) represent more than a hundred billion dollar investment. With more and more effort being expended on sensor fusion, the cost of testing complex systems is escalating and the need for international co-operation has never been higher.

For more information on the activities of the Southern Cross Chapter and/or ITEA please call the Chapter President, Mr Viv Crouch on (08) 256-2100 or drop a line to the following address.

Mr V Crouch, President  
Southern Cross Chapter, ITEA  
c/o Engineering Squadron  
ARDU, RAAF Edinburgh SA 5111

### **For further details:**

#### **IFAC committees and officers**

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# AIM-TEC 94



## CONFERENCE & EXHIBITION



*Sponsored by The Institution of Engineers, Australia*

### FOCUS ON ASIAN/PACIFIC RIM TEST AND EVALUATION

**ADVANCES IN MEASUREMENT SCIENCE  
T&E ENABLING TECHNOLOGIES  
EMERGING T&E LEGISLATION & POLICY  
APPLICATIONS TO LAND, SEA, AIR & SPACE ENVIRONMENTS  
EMERGING TECHNOLOGIES - T&E CHALLENGES  
SHORT COURSES ON T&E**

### WHEN & WHERE

27-29 April 1994

Conference:

Exhibition:

Adelaide Convention Centre

### CHAIRPERSONS

Professor Peter Sydenham

(University of SA, Education Chair, Southern Cross Chapter, ITEA)

Viv Crouch

(President, Southern Cross Chapter, ITEA)

### PARTICIPATING INTERNATIONAL ASSOCIATIONS

The International Measurement Confederation  
The International Test and Evaluation Association  
The International Federation for Telemetry

### CALL FOR PAPERS & POSTERS - March 93

#### For information contact:

The Conference Manager

AIM-TEC 94

AE Conventions Pty Limited

11 National Circuit, Barton, ACT 2600, Australia

Telephone: +61-6-270-6559

Fax: +61-6-273-291B

## CONFERENCES

ChemAsia/Instrument Asia '93 International Conference "Instrumentation and Control for Total Quality Management", 4-7 October 1993, Singapore.

For details: Michelle Morier, Singapore Exhibition Services, Singapore: fax (65) 330 5651.

ANZIIS-93 - First Australian and New Zealand Conference on Intelligent Information Systems, 1-3 December 1993, Perth.

For details: Ms V Di Giacomo: fax (09) 380 1101; ph (09) 380 3897.

IEE Control '94, University of Warwick, 21-24 March 1994, Coventry, UK.

For details: Louise Bousfield: fax +44 71 497 3633; ph +44 71 240 1871.

Safeprocess '94, IFAC Symposium on Fault Detection Supervision and Safety for Technical Processes, June 13-15 1994, Espoo, Finland.

For details: fax +358 0 146 1644; ph +358 0 146 1650.

IFAC Symposium on Robust Control Design, 14-16 September 1994, Rio de Janeiro.

For details: fax (55-21) 511-5154; ph (55-21) 529-9427.