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From the Editor

Welcome to the first IEEE Queensland Section Newsletter for 2005. The aim of this newsletter is to provide a means of keeping IEEE Members in Queensland abreast of any events in the IEEE. There will be three newsletters this year (1st Quarter, 2nd Quarter and 3rd Quarter) I hope you find them useful and informative.

If you have any comments on the content of the newsletter or suggestions for improvements, please feel free to e-mail me at: j.birt@griffith.edu.au.

James Birt
Newsletter Editor Queensland Section

From the Chair - Queensland Section

One more time I wish to give all our Queensland Section members the warmest welcome. Last year we had several innovations. One of them is the change of bylaws. One of the implications of this change is that the term of officers is now for two years, instead of one. This allows better planning of activities, in particular for the Section Chair and the Chapter Chairs. It also aligns us with what is practiced in other Sections in Australia. For the period of transition from one to two year terms of office, the following arrangements were made: I will remain as Chair until May 2005. Then from June 2005 until end of 2006, the current Vice Chair Prof. Tapan Saha, from Queensland University, will became the new Chair. Prof. Saha has held several offices in the Queensland Section. The arrangement of being Vice Chair before becoming Chair ensures that good opportunity for continuity of the office is granted. It contributes to an overall better service. For the remainder of my office term, I intend to implement several improvements, aimed at making the tasks easier for office bearers.

The other innovation was to have our monthly Queensland Committee meetings as conference calls. Our committees clustered on three places such as University of Queensland, QUT, and Griffith University Gold Coast. This saved us all many hours of commuting, and made the meetings more efficient and easier to participate. Why I am saying this? Some of our officer vacancies are not yet filled. We do need more volunteers to fill a position or to become an apprentice for chapter chairs. What does it mean? A two hour Committee meeting every month (now changed to 5:30 to 6:30PM), and anything between 2-10 hrs per month (in the volunteer's own time) could make a great contribution. Please ask me if you are interested, else go to **http://www.ieee.org/organizations/vols/**

Last but not least, I kindly ask each and every one of you, to be ambassadors in recruiting new IEEE members. Please talk to your colleagues, fellow engineers and, students, so that we can grow and offer more professional activities. I take this opportunity to proudly announce our new Chapter on IEEE Computational Intelligence. Have a look at what this and all other Queensland Section Chapters are planning for this year. Come and join us in these events!

Dr. Renate Sitte
Chair Queensland Section

From the Chair of the Control Systems/Robotics and Automation Joint Societies Chapter

The IEEE-CS/R&A Societies Chapter Lecture

25 August 2005, Hawken Auditorium, Engineers Australia

Reconfigurable Computing & Real-Time Systems

by

Professor Neil Bergmann
University of Queensland

This talk is on the exciting topic of Reconfigurable computing which combines programmable software with FPGA-based programmable hardware and shows real promise as an efficient implementation technology for real-time embedded computing applications. The presentation will be presented by our fellow colleague and the world recognised authority in the field, Professor Neil Bergmann, the University of Queensland.

The lecture is organised in collaboration with Engineers Australia.

The IEEE-CS/R&A Societies Chapter Lecture

14 September 2005, Hawken Auditorium, Engineers Australia

Fifty Years in Control Engineering; Changes in Technology and Manufacturing.

by

Derek P Atherton
University of Sussex.

The presentation will discuss some of the developments that have taken place in engineering, primarily control engineering, during the last fifty years. It will also speculate on what of the next fifty years, now, when it is only just over a hundred years since the most eminent scientist in the UK said no machine heavier than air could fly!

The distinguished engineer, educator and scientist, Professor Atherton, has given invited lectures in many countries and supervised over 30 doctoral students.

The lecture, being the 2005 Queensland Electrical Manufacturing Lecture, is organised jointly with Engineers Australia and the IEE Queensland.

Prof. Ljubo Vlacic
Chair IEEE Control Systems/Robotics & Automation Joint Societies Chapter Queensland Section

IEEE News

For a report on news around the IEEE, you can check out *The Institute*. The most current version can be found at ***http://www.ieee.org/theinstitute***

From the Chair of the Joint Microwave Theory and Techniques and Antennas and Propagation Chapter

IEEE DISTINGUISHED LECTURE

Topic: Applications of microwaves in medicine
Lecturer: Professor Maria Stuchly
Date: 15th April 2005
Time: 3 PM
Venue: GP-South Building. Room 78-420, University of Queensland, St. Lucia Campus

Abstract:
Applications of radiofrequency and microwave fields in medicine are not new, but recent advances in computer modeling, component fabrication and decrease in cost have resulted in new and old ideas coming to fruition. The non-ionizing nature of this part of the electromagnetic spectrum makes it particularly attractive for diagnostic applications. On the other hand, heating, the well-known interaction with biological tissues, enables some therapeutic uses. Because of the heterogeneous electrical properties of the human body and irregular shapes, the finite difference time domain (FDTD) is extensively employed to model interactions of fields with tissues and to design effective devices. The finite element method (FEM) is also used, although less popular, as most human body models consist of cubic voxels, and are thus directly compatible with FDTD.

One of the most promising diagnostic methods is the breast cancer detection. This application is based on differences in electrical properties between a healthy and diseased tissue. Two approaches have been explored, a classical tomography, and a wideband radar-based technique. Tomography provides complete maps of tissue properties and involves the solution of inverse scattering problems, which are not unique; furthermore, the wave penetration depth limits resolution. Despite these inherent difficulties, promising results have been reported and there is at least one system in clinical trials in the USA. The radar based approach considers illumination of the breast with ultra-wideband pulses, typically from 0.5 to 15 GHz, from several antenna locations and observation of the scattered returns by the same antenna. The critical issues involve processing of the return signals to ensure coherent addition of these returns from the same tissue location for different antenna positions. In practical implementations of this approach, the system operates in the frequency domain with wide range of frequencies, and the data are converted into the time domain in post processing. Excellent results promising detection of sub-millimeter tumors have been reported by two research groups.

Several highly successful therapeutic applications have been reported. They include highly localized, as well as regional heating. Examples of localized heating include angioplasty, cardiac ablation to treat arrhythmias, esophageal ablation and cornea shaping. Regional heating has been achieved with implanted antennas, and surface arrays. What made a significant difference in efficiency of these treatments in recent years is the extensive modeling and simultaneous temperature evaluation, and thus control of the heating profile.

Speaker Biography:
Maria A. Stuchly received the M.Sc. degree in 1962 from Warsaw Technical University and the Ph.D. degree from the Polish Academy of Sciences in 1970, both in electrical engineering.

Between 1962 and 1970, she was with the Warsaw Technical University, and the Institute of Polish Academy of Sciences. After immigrating to Canada in 1970, she was with the University of Manitoba. In 1976, she became a research scientist with the Bureau of Radiation and Medical Devices in Health Canada. Since 1978 she was an Adjunct Professor at the Electrical Engineering Department at the University of Ottawa, and in 1990-91 served as a Funding Director of the Institute of Medical Engineering. In 1992, she joined the University of Victoria as a Visiting Professor with the Department of Electrical and Computer

Engineering, and since January 1994 she has been a Professor and Industrial Research Chair-holder funded by the Natural Sciences and Engineering Research Council of Canada and industry.
In 2004, Dr. Stuchly became Professor Emeritus at the University of Victoria and an adjunct Professor at ECE Department at the University of British Columbia in Vancouver.

Dr. Stuchly's current research interests are in numerical modeling of interaction of electromagnetic fields with the human body, medical applications and design of wireless communication antennas. She has published nearly 200 articles in refereed journals, and contributed over 300 papers to scientific conferences.

Dr. Stuchly is a Fellow of the IEEE. She served as Associate Editor of IEEE Transactions on Antennas and Propagation, and currently is an Associate Editor of Proceedings of IEEE, and IEEE Transactions on Biomedical Engineering. She held several elected offices, among them AdCom member of IEEE Biomedical Engineering Society, international URSI Commission K chair and Vice-President, President of Bioelectromagnetics Society.

For catering purposes please send RSVP to ieee@micreo.com by 11th April 2005.

Ashley Robinson
Chair of MTT/AP Queensland Section

Visit the section website

http://www.ieee.org/queensland

From the Chair of the Computational Intelligence Chapter

Now that the Queensland Chapter of the IEEE Computational Intelligence Society has been approved I wish to invite all member of the Queensland section to participate in the chapter's activities. This year's activities will be dedicated to showing current work in Computational Intelligence in our state through as series of presentations by chapter members. To make these presentations more accessible to IEEE members across the state we intend to use the Access Grid teleconferencing facilities available at the Universities. For those of you unfamiliar with Access Grid, this is a very nice teleconferencing facility that uses the high speed network linking Australian universities.

The meetings will feature two 30 minute presentations (presenters TBA), followed by General discussion (issues raised by participants). Details of venues will be announced. Tentative dates for the presentations are as follows:

Friday 15 April 2005 Inaugural event and introduction of members
Friday 22 July 2005
Friday 21 October 2005

For further enquiries and suggestions please email to j.sitte@qut.edu.au.

A/Prof. Joaquin Sitte
Chair Computational Intelligence Chapter

Event Notification

Are you organising an event that is relevant to the IEEE Queensland Section? If so, e-mail the editor (*j.birt@griffith.edu.au*) and let us know! We might be able to advertise it in the newsletter for extra exposure.

From the Chair of the Power Engineering Society Chapter

The Power Engineering Society Chapter is pleased to announce the coming IEEE / PES seminar:

Robust Power System Transient Stability Enhancement:
A Global Control Approach

By

Professor Y. Wang
School of Electrical and Electronic Engineering
Nanyang Technological University, Singapore

Time: 12-1pm, Tuesday 22 Mar 2005
Venue: GPS(78)-420

Contact: Dr ZY Dong, zdong@itee.uq.edu.au, Tel: 07 3346 9052
Light refreshment will be provided

Abstract:
In order to keep up with power demand increases, power systems have become complex interconnected systems. As the deregulation of the power industry and environmental concerns advance recently, the transmission lines are expected to operate at maximum capacity to meet increasing demands for electric energy. Therefore, it is necessary to require the control system to maintain the stability of this stressed system under a severe disturbance. As we know that the nonlinearities and parameter uncertainties of a power system and the system behavior following a severe disturbance preclude the use of linear control techniques.

In this talk, a new control technique, called global control technique, is presented for transient stability enhancement. The nonlinear power system model is first linearized over the whole operating region by using the direct feedback linearization (DFL) technique. After linearization, the system model can be treated as a linear system with large parameter uncertainties. A robust partial controller for each partial model is designed for different operating regions.

Finally, the global control technique is used to integrate the local controllers together. The single-machine infinite-bus power system is used as an example system to evaluate the effectiveness of the proposed controller. Simulation results demonstrate that the proposed global control technique can provide superior performance in power system transient stability enhancement.

Speaker Biography:
Professor Wang is a leading researcher in power system nonlinear control with over 200 journal and conference papers in this area.

More seminars and presentations are being organised, including IEEE DL, for IEEE PES Queensland Chapter 2005 activities.

Dr Zhao Yang Dong
Chair of Power Engineering Society Chapter Queensland Section

From the Membership Development Chair

This report covers activities conducted by myself in the role of membership Development chair during February and April.

Activities included chasing up access to the membership database (SAMIEEE), creating the first report with a member listing for the committee members and identifying a number of tasks that could be done to try and attract greater membership in the organisation. These tasks are as follows:

- Start a (Graduates of Last Decade) GOLD program in the QLD section. I hadn't found anything to identify that one currently operates in QLD. The other Australian states appear to mostly have them
- Identify and build all the reports required to supply the appropriate data to each committee member on membership, i.e. society reports.

Next month I propose to follow up on establishing GOLD in Queensland and complete a set of reports for each society chair to update them with current members. Also I will work on creating a presentation for giving at University campuses to increase membership

Peter McLarty
Chair of Membership Development Queensland Section

From the Treasurer

I wish to encourage the level of professional activities in the Queensland Chapter. At the moment we have over $50K. If we keep on accumulating funds it may affect our rebates from HQ in the future.

Amoakoh Gyasi-Agyei
Treasurer Queensland Section

Conference Announcement

ACSAC 2005

The Tenth Asia-Pacific Computer Systems Architecture Conference
October 24-26, 2005, Singapore

IMPORTANT DATES:
Deadline for submissions: 15 May, 2005

http://www.acsac05.ntu.edu.sg

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