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Institute of Electrical and Electronics Engineers  
Queensland Section (ARBN 078576495)  
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IEEE

# Queensland Section

NEWSLETTER

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## Message from the Chair IEEE Queensland Section

Mr Abbas Bigdeli

This is our last edition of the newsletter for 2009. I am pleased to report to you that our Queensland Section has continued to be very active throughout the year. This year was my first year as the Chair. You may recall that I stepped in as the Chair due to sudden resignation of our Chair Elect, A/Prof Joe Dong at the beginning of the year. So the learning curve for me has been steep in 2009.

During 2007 and 2008 we had two new Chapters and one Affinity Group formed in our Section. This year, we didn't have any new ones, so it has been more of a solidifying year for the Section.

I am pleased to report that all of our technical chapters have held several events through the year to date and even more are planned for the remaining weeks of 2009 for some of them. I invite you to see the details of the upcoming events in this newsletter. I would like to congratulate all Chapter Chairs for their wonderful service to IEEE. You will always find detailed information about the scheduled events in our newsletters and our brand new website ([www.ieee.org/queensland](http://www.ieee.org/queensland)).

Over the last few weeks we completed the election process for 2010. Results will be announced during the AGM. We did not require a vote, as there was only one nomination for each position. I would like to congratulate all nominees for their willingness to serve IEEE. I would also like to thank the members of the various Nomination Committees for their support of the election process.

### Membership Approaches 1,000

Our membership is growing strongly. From 684 members of all grades at the end of 2005, we had 991 members on 31st October this year, an annual growth rate of close to 10%. We would like to celebrate the achievement of 1,000 members. We expect our 1,000th member will join during the next few days. We plan to honour our 1,000th member at our Annual Dinner on Friday, 4th December (please see the Vice Chair's report for more details on the Dinner). To our 1,000th member, we will offer a free ticket to the dinner. You can help us to reach this important milestone.

To show our gratitude, if you are the referrer of the 1,000th member, we'd like to offer you a free ticket too. No doubt you know of an eligible someone in your workplace or school who is not yet an IEEE member. Just direct them to [ieee.org/join](http://ieee.org/join) and ask them to enter your name and membership number as the referrer. IEEE HQ will reward you for your recruitment efforts too: see the 'Member Get a Member' initiative: [ieee.org/mgm](http://ieee.org/mgm).

I look forward to meeting as many of you as possible at the AGM and Annual Dinner on December 4th.

## Notification of the 2009 Annual General Meeting and Dinner Lecture

**Mr Roelof Swanepoel**  
**Vice-Chair, Queensland Section**

IEEE Queensland Section has been active for 25 years, promoting the technical and professional goals of the IEEE locally. On 4 December 2009, we will be holding its annual general meeting at the University of Queensland Staff Club. To celebrate 125 years of IEEE, the Section Committee cordially invites you to attend this meeting.

This year marks a departure from our previous AGM formats, and you are encouraged to join us and experience this for yourself! In addition to substantially lowering the cost of the event to make it more accessible, we have also invited the Queensland Premier. Also, keep an eye out for an e-notice on our 1000th member drive – a free dinner may be up for grabs!

The technical guest speaker for the evening is **Dr Doone Wyborn**, Chief Scientific Officer of Geodynamics Limited. The topic of his presentation will be:

### ***Enhanced Geothermal Systems: the answer to Australia's requirement for large scale base load clean power***

EGS has been researched for several decades but it looks like Australia has the optimal conditions to perfect the technology and open up the potential to economically generate base-load electricity on a large scale. The conditions that make this so will be described and the world scene for EGS will also be discussed. There is considerable new money now forthcoming from the US DOE budget for EGS and the US Secretary for Energy Steven Chu is an advocate.

The AGM will start at 18.00 (drinks served from 17.30), with an expected end time of 21:30. Dress code is business casual. Costs for members will be \$30, and non members (including partners) may attend at a cost of \$60. More information on the venue can be found at <http://www.uq.edu.au/uqclub/>.

Payment can be made by cheque, payable to IEEE Queensland Section and mailed to

C/O Jasmine Banks – Treasurer IEEE Qld Section  
School of Engineering Systems  
Queensland University of Technology  
GPO Box 2434 Brisbane  
Qld  
4001

or direct deposit, to the following account:

Account name: **IEEE Qld Section A/C**  
Account number: **08300761**  
BSB number: **803-140**

To RSVP, or should you have any further queries, please do not hesitate to contact our secretary, Bart Sedgwick, at [bart.sedgwick@aecom.com](mailto:bart.sedgwick@aecom.com).

For catering purposes, we kindly request a reply by 20 November 2009 or as soon as possible thereafter, including any specific dietary requirements.

## CQUniversity Student Branch Update

**Dr Shawkat Ali**  
**Student Counsellor, IEEE CQUniversity Branch**

Recently we organised a networking event among existing and new IEEE members at CQU (new name CQUniversity). Event details may be found through

- the CQUninews link at <http://uninews.cqu.edu.au/UniNews/viewStory.do?story=6387>
- the media download link: <http://tinyurl.com/ydkb9ly>

It was a very successful event. The chief guest was Professor Kevin Tickle, Pro-Vice Chancellor and Executive Dean of the Faculty of Arts, Business, Informatics and Education. In his speech, Professor Tickle mentioned the diversity of disciplines represented among the members of the society and the networking opportunities available both at national and international level. Dr Mark Griffin, Student Activities Chair at Queensland Chapter, addressed the audience through an ISL linkage. He introduced several student branches in Queensland and the possibilities to link with industries through IEEE members. On that day, 15 people have shown their interest to become IEEE member.



## QUT Student Branch Update

Dr Jasmine Banks  
QUT Student Branch Counsellor

The IEEE QUT Student Branch had a presence at the Student Showcase and BBQ, held on 5 August. Interested students had the opportunity to stop by and ask questions about the IEEE Student Membership. Many thanks to representatives from GOLD who were able to assist with staffing our table on the day.

An event was held on Thurs 13 August. Andrew Thomson, the student representative from Region 2, gave an entertaining presentation, where he discussed what IEEE membership has meant for him, and showed photos and videos from the Student conference he recently attended.

We also held the traditional raffle where IEEE T-shirts were given away. The event concluded with general networking and lunch, and a number of new members signed up on the day.

We are in need of more people to join our team and fill a variety of jobs in the Student Branch such as Secretary, Treasurer, Webmaster, and Event Organiser. Please contact one of the 2009 Office Bearers below if you are interested in joining us.

Student Branch Office Bearers 2009

Chair: Jishu Das Gupta ([j.dasgupta@qut.edu.au](mailto:j.dasgupta@qut.edu.au))

Vice Chair: Chris de Vries ([cdevries@ieee.org](mailto:cdevries@ieee.org))

QUT Student Branch Counsellor: Dr. Jasmine Banks ([jbanks@ieee.org](mailto:jbanks@ieee.org))



QUT Student Branch table at the Student Showcase and BBQ.



Andrew Thomson giving his presentation.

## GOLD Affinity Group Update

Mr Robert Ellen  
Chair, Queensland GOLD Affinity Group  
Mr Roelof Swanepoel  
Vice-Chair, Queensland GOLD Affinity Group

### Previous Event for 2009

IEEE Queensland Graduates Of the Last Decade (GOLD) was lucky enough to have Barry O'Sullivan as a guest speaker on 20 October, at QUT Gardens Point campus. Mr O'Sullivan's presentation, aptly titled 'Fear-free Presentations,' provided some very valuable insight into the art of public speaking. During the two-hour workshop, there were also several standup exercises where the audience was actively involved in a practical yet non-confronting way. Items covered included voice exercises, projection and audience engagement methods. The function was well attended, with several IEEE and GOLD members among the 25 guests. We hope to have Mr O'Sullivan back soon to gain more from his considerable experience!



Mr Barry O'Sullivan addressing the guests



Half-time refreshments provided by GOLD



Speaking exercises



An enthusiastic Barry O'Sullivan

### GOLD Affinity Group Networking Site Presence

The Queensland GOLD Affinity Group recently launched a group on the popular social networking site Facebook.com. The group can be found by searching for 'IEEE GOLD Queensland' within Facebook. We encourage everyone interested in keeping in touch with the GOLD AG to join the group.

Last edition we reported that the IEEE Queensland Section has a Group on the popular professional networking website linkedin.com and that the Queensland GOLD AG formed a Sub-Group under the Queensland Section group. Again, we encourage all IEEE members who are on LinkedIn to join the Queensland Section group and all those interested in GOLD to join the Sub-group.

The intention is to use these networking websites to augment the current communication between the GOLD office bearers and GOLD members. We will, among other things, post news and notifications to these services, however all members will continue to receive event-notification via the E-Notice service.

**Upcoming Event – i.lab Incubator****The Engineers Australia Queensland ITEE Branch  
and the IEEE Queensland GOLD Affinity Group**

invite you to the following free seminar on November 26th at Engineering House, Brisbane CBD

***i.lab Incubator***

Assistance for New Technology-Based Ventures

Presented by **Mr Peter Allison**  
Business Development Manager  
i.lab Incubator Pty Ltd

**Venue** Hawken Auditorium  
Engineering House  
**447 Upper Edward St, Brisbane**  
Map URL: <http://tinyurl.com/yzgxhae>

**Time Thursday November 26<sup>th</sup>, 2009**  
5:30pm (refreshments) for **6:00pm start**  
Please stay for networking following the  
presentation

**(non-members of IEEE and Engineers Australia are very welcome to register and attend)**

**Synopsis:**

i.lab Incubator was established by the Queensland Government in 2000 to aid the establishment and growth of new technology-based ventures in Queensland. After nearly 10 years of assisting well over 100 member companies, i.lab has graduated successful and rapidly growing businesses and learned a lot about what it takes for new tech-ventures to succeed.

Peter Allison, i.lab Incubator Business Development Manager, will outline the roles the incubator performs, how it engages the local business community to assist, and some of the key lessons learned. He will outline some of the fatal flaws that new venture must avoid and the key requirements for commercial success. He will also talk about some specific member companies involved in software and hardware electronics commercialisation and steps and paths they took to success.

**Biography:**

Peter is currently the Business Development Manager with i.lab Incubator Pty Ltd – a Queensland Government funded organisation that assists early-stage ICT, biotechnology, medical device and electronics companies to commercialise their new technology. Peter's professional background is in Market Research and Marketing Consulting having worked as an independent marketing consultant and with companies such as Marketshare Pty Ltd and Corporate Context Pty Ltd since undertaking a UQ MBA in the late 1980s. For some years Peter was also an Adjunct Lecturer in Marketing for the UQ Business School MBA program. Peter has personally been through the highs and lows of launching his own Internet-related start-up business and learnt a lot from the experience.

**Registration** Please register your attendance by contacting Engineers Australia Queensland Division  
Please specify the event in your registration (ITEE Event November 26)  
Phone: (07) 3832 3749  
Email: [qld@engineersaustralia.org.au](mailto:qld@engineersaustralia.org.au)

## Aerospace and Electronic Systems Chapter Update

**Mr Robert Ellen  
Chair, AESS Queensland Chapter**

### Report of 2009 Events

The AES Chapter has held two technical seminars in 2009. The first seminar, as previously reported in the August edition of the newsletter, was *Vigilare: A Complex Systems Integration Project*, given by Mr Lee Davis and Mr Don Cameron of Boeing Defence Australia.

The second seminar was the AES Chapter's very first seminar as part of the AES Society's Distinguished Lecture Program. We were very fortunate to receive Dr George Schmidt from MIT, who gave a very impressive presentation on *Global Positioning System (GPS) and Inertial Navigation System (INS) integration technology trends*. It was great to see over 50 people attend the seminar at QUT on the 19th of October.



Mr Lee Davis of Boeing Defence Australia explains a video of a real-time battle simulation in *Vigilare*



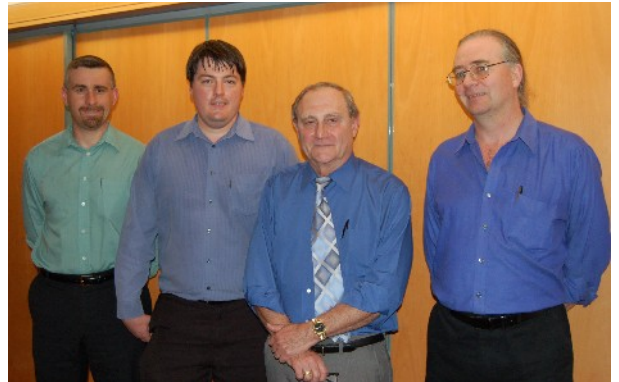
Dr George Schmidt begins his Distinguished Lecture



Attendees of the chapter's first Distinguished Lecture



Dr Schmidt answers audience questions



George Schmidt with Queensland AES Chapter officers for 2009: Secretary Mr John Davies (outer-left), Chair Mr Robert Ellen (inner-left) and Vice-Chair Prof Peter Lindsay (right)

### Concluding Remarks for 2009 from AESS Chair Mr Robert Ellen

I will be stepping down as AESS Chair at the end of 2009. The process of setting up a new chapter and getting it active has been very rewarding. I would like to thank everyone who has been involved in making the AES Chapter the success it has been since its formation in mid 2008. Two groups stand out for thanks for their efforts. Firstly to those who assisted with the chapter formation petition in 2007 and 2008, especially those at QUT. It was a long haul but we got over the line in the end. Secondly, to my fellow chapter officers for 2009, Vice-Chair Professor Peter Lindsay and Secretary Mr John Davies – it was your invaluable assistance that made our activities as successful as they were and made my life as chair much easier and more enjoyable. I wish the officers of the AES Chapter for 2010 all the very best.



## Computational Intelligence Society Chapter Update

Dr Marcus Gallagher

### Student Travel Scholarships to Computational Intelligence Summer School

The IEEE Queensland Section has offered several Student Travel Scholarships to the First Australasian Computational Intelligence Summer School (ACISS'09). Held in association with the 22nd Australasian Joint Conference on Artificial Intelligence (AI'09), the Summer School aims to introduce researchers (graduate/postgraduate students and early career researchers in particular) to the general area of Computational Intelligence as well as recent advances in the field. The Queensland Section offered travel scholarships to student IEEE members to support travel expenses to the summer school.

More information about the summer school and conference can be found at <http://goanna.cs.rmit.edu.au/~xiaodong/aciss09/>

### Annual Postgraduate Symposium

Each year the CI Chapter hosts a Postgraduate Student Symposium inviting Queensland-based postgraduate researchers in the field of CI to present their original work to their peers via the Access Grid multi-node teleconferencing system. This year we had a very successful day with postgraduate researchers from CQUni, Griffith, UQ, QUT participating.



*Delegates from CQUniversity, Griffith University, University of Queensland and Queensland University of Technology linked up via Access Grid*



*A delegate presenting, the slides visible to all nodes of the Access Grid*

## Computer Society Chapter Update

IEEE Computer Chapter held its final public event for the year at The University of Queensland, St Lucia on Thursday 12 November 2009, when Dr Philip Machanick presented a talk titled "Beyond Moore's Law", jointly hosted by the IEEE Computer Chapter and NICTA Queensland.

Opening topics covered included interpretations of Moore's Law and trends and potential limits in the scaling of silicon technology. The consequences of past technology 'inflection-points' were used to discuss where major advances in computing technology may occur in the near future, Dr Machanick predicting areas to watch as real time, techniques for scaling functionality by combining multiple devices in single packages and technologies designed for low power.



## Control Systems / Robotics & Automation Joint Chapter Update

Assoc. Prof. Duncan Campbell  
Chair, CSS/R&A Queensland Joint Chapter

### Previous Events for 2009

In August, the CSS/RA Joint Chapter and QUT hosted an industry based presentation and discussion panel, "Two Cases of Industry Best Practice Automation and Control - Presentations and Discussion Panel" by Mr Paul Brodie (Foster's Yatala Brewery), and Mr Jonathan Laver and Mr Dennis Beck (ERM Power). There were 34 attendees with much lively discussion inspired by the presenters. We thank Paul, Jonathan and Dennis for their efforts and most inspiring presentations around industrial control best-practice.



*From left: Mr Dennis Beck, Mr Jonathan Laver and Mr Paul Brodie discuss audience questions related to best-practice in industrial automation and control*

On Monday, 16 November, we were pleased to host a joint IEEE/QUT event, "Half a Century of Control Theory – Is it Stable Yet?", presented by Professor John Billingsley from the University of Southern Queensland. Prof Billingsley is well known in the control and mechatronics areas, having pioneered many developments and written several books on the subjects.

His presentation generated discussion and debate around questions of control theory and practice, particularly the applicability of various techniques to practical control problems. This topic was most appropriate for the CSS/RA Joint Chapter 10th year anniversary.



*Professor John Billingsley*



*Some of the attendees of the control theory seminar*

## Microwave Theory / Antennas and Propagations Joint Chapter Update

Dr Aleksandar Rakic  
Chair, MTT/A&P Queensland Joint Chapter  
Dr Karla Ziri-Castro  
Vice-Chair, MTT/A&P Queensland Joint Chapter

### Recent Events

The MTT/A&P chapter has recently organised two seminars by leading experts in the area of applied electromagnetics, nano-plasmonics and microwave electronics. The details are as follows:

#### ***Radio-Frequency Applications of Nanotechnology: Nano-Plasmonics towards a New Generation of Extremely-Integrated Circuits for Electronics, Computing and Communications***

A distinguished lecture by Professor Erping Li from the Institute of High Performance Computing, A\*STAR, Singapore. The seminar was held on the 14th September in Building 69, University of Queensland. It was a state-of-the-art lecture into electromagnetic wave propagation in nano-technology, dealing with Maxwell's equations in nano-regime. The lecture also covered A\*Star's developments of a plasmonics detector that converts plasmonic waves into electronic signals where optical and electronic devices are in nano-meter scale.

#### ***Lunch with Dr. Ashley Robinson***

The seminar was held on Tuesday 11th August at the Kathleen Room, UQ Staff & Graduates Club. Dr. Ashley Robinson is Engineering Director at Microo Ltd., with more than 15 years experience in the design of microwave electronic hardware. It was a very interesting talk that addressed the question of "what can we do in microwave engineering in Queensland?" The discussion focused on how to create and export globally competitive microwave products in our local environment.

Please stay tuned to your email for information on future events.

## Power and Energy Society Chapter Update

Dr Jose Lopez Roldan  
Chair, PES Queensland Chapter  
Professor Tapan Saha  
Vice-Chair, PES Queensland Chapter

### Report on Activities for 2009

#### **Seminar: Electric-Drive Vehicles - A Technology Update including Recent Experiences from North America**

Date: Monday 2nd March, 2009

Speaker: Dr Andrew Simpson (NREL and Tesla Motors Inc in California), a former UQ student.

Venue: The University of Queensland 50+ attended with majority from industry

In this seminar, Dr Simpson provided an update on the market readiness of EVs and their supporting infrastructure. He identified some key players from the industry including vehicle manufacturers, component vendors, electric utilities, regulatory bodies and start-up companies. He also shared some lessons learned and commented on opportunities and barriers faced by EV technology. Overall, he promoted an informed discussion of the potential for EVs in Australia.

#### **Workshop: Insulation Coordination of transmission and distribution networks**

Days: 22-23 June 2009

60 delegates attended from the major electricity utilities in Australia and New Zealand

Speakers: Five presenters from Powerlink, TransGrid, ABB, QUT and UQ

Joint event with Engineers Australia (hosted in the Engineers Australia Hawken auditorium)

This seminar presented theory and practical applications of insulation coordination of transmission and distribution networks. This seminar was suitable for managers, project managers, procurement officers, engineers and technicians involved in the design, specification, purchase operation, maintenance and manufacture of transmission and distribution equipment and installations.

#### **IEEE-PES Distinguished Lecture -Seminar & Tutorial**

Speaker: Saifur Rahman, Joseph R. Loring Professor & Director-Virginia Tech Advanced Res. Inst.

Date: 21st August, Friday-Time: 2-5pm

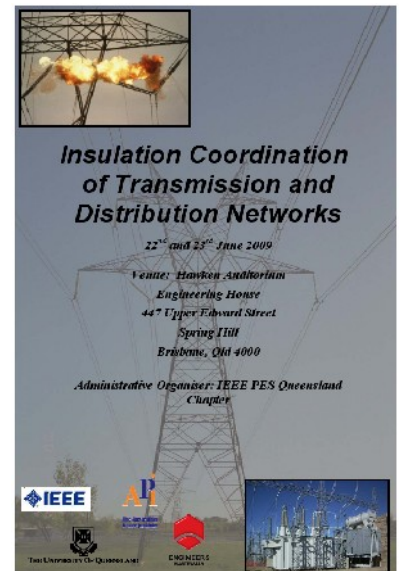
65+ attended with two third from the utilities and other power industry

#### **Seminar: What is the Smart Grid and What is Needed to make it a Reality?**

This speaker presented the concept of the Smart Grid, which is starting from the power station to the end-use device - smarter, safer, and more reliable using advanced sensors, communication technologies and distributed computing. A smart grid will look more like the Internet, where information about the state of the grid can be exchanged quickly over large distances. It will also allow integration of new sustainable energy sources, such as wind, solar, off-shore electricity, etc. There are four attributes of the Smart Grid that need to work interactively for this concept to be a reality. These are: Technology, Standards, Public Awareness and a Policy of Incentives.

#### **Tutorial: Role of Renewable Energy in Mitigating the Need for Large Central Station Power Plants**

Renewable energy sources can fill the need for both stand-alone remote area electricity needs, and large-scale central station power plants. Small scale renewable sources of electricity including solar, wind, biogas and small-scale hydro offer opportunities to provide electricity to the disadvantaged thus allowing them to benefit from electrical lights, televisions, computers, internet, mobile phones, etc. The commercial, educational, social and healthcare benefits brought in by these technologies to the



disadvantaged population in the developing countries is a great hallmark of the late 20th and the early 21st century. On the other hand, due to the investments made and policy support provided in several industrialized countries to reduce carbon emissions from the production of electricity, there is now a robust market for wind and solar energy projects in many countries - both developing and industrialized. This presentation addressed such issues and highlighted the success stories and future plans for the growth in renewable energy technologies globally.



*Distinguished Lecturer Saifur Rahman and the PES Chapter Vice-chair Tapan Saha with the audience*

## Signal Processing and Communications Joint Chapter Update

Dr Garry Einicke

Chair, SP/Comm Queensland Joint Chapter

### Report of Past Events for 2009

The SP/Comm chapter has held two events so far in 2009. These were

- Assoc/Prof Mieso Denko, University of Guelph, Canada presented a seminar entitled "Scheduling and Data Management Techniques in Wireless Mesh Networks: A Cross-layer Approach" at UQ on 8 July 2009.
- A/Prof Lachlan Andrew, Swinburne University of Technology, gave a talk on "Speed scaling for an energy-efficient Internet" at UQ on 9 October 2009.

### Upcoming Events

The SP/Comm chapter has an action-packed end of year in store with three upcoming events including two Distinguished Lectures.

#### *Distinguished Lecture: Trends of Next Generation Networks*

**Speaker:** Prof Koichi Asatani, Kogakuin University and Waseda University, Tokyo

**Date:** Friday, 20th November 2009

**Time:** 2pm - 3pm

**Venue:** University of Queensland, St Lucia Campus  
Building 78, Room 420

#### **Abstract**

Next Generation Network (NGN) is designed to be capable of QoS management and controls like in traditional telecommunication networks and to support economical, versatile multi-media applications like those on the current Internet. NGN also provides fixed-mobile convergence (FMC) with generalized mobility, and horizontal and vertical roaming as well as improved security. The concepts and architecture of the Next Generation Networks (NGN) are described. NGN voice and Internet services are attractive from the view points of service flexibility and cost effectiveness and the capability of integrating third-party applications with high dependability and high security. The current status of NGN implementation in a commercial offer by NTT (Nippon Telegraph and Telephone Corporation) is touched upon. Issues for the global evolution of NGN are also described, such as technical key issues, global standards and regulations.

#### **Bio**

Koichi Asatani received his B.E.E.E., M.E.E.E. and Ph. D degrees from Kyoto University in 1969, 1971 and 1974, respectively. From 1974 to 1997, Dr. Asatani was engaged in R&D on optical fiber communication systems, hi-definition video transmission systems, FTTH, ISDN, B-ISDN, ATM networks, IP networks and their strategic planning in NTT. Currently he is Dean, Department of Computer Science and Communications Engineering, Kogakuin University, and a visiting professor, Graduate School of Global Information and Telecommunication, Waseda University, both in Tokyo, Japan. He is a Fellow of IEEE and a Fellow of IEICE. He was appointed as a distinguished lecturer of IEEE Com Soc for 2007-2009.

He is a founder of Communications QoS, Reliability and Performance Modeling series symposium at ICCs and Globecom. He served as co-chair for this symposium series at ICCs and Globecom for 2002-2004. He is Ex-Chair and Advisory Board Ex-Chair Emeritus of IEEE Technical Committee on Communication Quality and Reliability (CQR-TC), Feature Editor on Standards (1993-1999), Senior Technical Editor/Technical Editor (1999- ) of IEEE Communications Magazine, and Technical Editor on Broadband Technology of IEEE Communications Survey. From 1988 through 2000, he served as Vice-Chairman of ITU-T SG 13 (formerly CCITT SG XVIII), responsible for digital networks including GII, IP networks and NGN. He is serving as Chair for National Committee on Next Generation Networks in Japan, and also as Chair, R&D and Standardizations Working Group, Next Generation IP Network Promotion Forum. He has published more than fifty papers, and gave more than seventy talks including keynotes and invited talks at international conferences such as ICCs and Globecom. He is author or co-author of eighteen books including "Designs of Telecommunication Networks"(IEICE, 1993, in Japanese), "Introductions to ATM Networks and B-ISDN" (John Wiley and Sons, 1997), "Multimedia Communications Networks - Technologies and Services" (Artech House, 1998), "Multimedia Communications" (Academic Press, 2001), "Information and Communication Technology and Standards" (Denki Tsushin Shinko Kyokai, in Japanese, 2006), "Introduction to Information Networks-Fundamentals of Telecom & Internet Convergence, QoS, VoIP and NGN" (Corona-sha Publishing Inc., in Japanese, 2007). His current interests are Information networks and Network Architectures including Broadband networking, Internetworking, IP telephony, NGN and their QoS aspects.

**Seminar: High Precision Navigation Technologies on Embedded Solutions**

**Speaker:** Antonio Defina, Politecnico di Torino and Istituto Superiore Mario Boella, Torino.

**Venue:** CSIRO, Queensland Centre for Advanced Technology, Pullenvale

**Date:** Mon 7th December 2009

**Time:** TBA

**Abstract**

The speech presents recent R&D results of the NavSAS Group in the field Differential GPS as an enabling technology for innovative embedded solutions.

Applications of embedded systems in the field of mobility (road or pedestrian) are generating new requirements to navigation technologies mainly in relation to availability and accuracy under the general requirement of low cost.

The talk will analyze these concepts proposing as a case study an innovative project (started recently) named MAPPER. In few word the MAPPER will be a low cost (around € 200) embedded mapping tool capable to reach via a dedicated web application sub-meter accuracy (DGPS in post-processing) Such a solution suites perfectly on activities aiming to map outdoor paths.

**About the NavSAS**

NavSAS is a joint group of Politecnico di Torino and Istituto Superiore Mario Boella focused on navigation & localization research topics.

It was born from the experience of the Signal Analysis and Simulation (SAS) group within the Telecommunications Group of Politecnico di Torino, specializing the telecommunication expertise in the field of navigation.

Politecnico di Torino is one of the largest technical universities in Italy while ISMB is a private non-profit research center founded by Politecnico di Torino with Compagnia di San Paolo and joined by private companies aiming at the development of applied research in the ICT field.

Enabling GNSS core technologies, added value location based services and Galileo in all its aspects are the topics of the NavSAS intense research work. The group activities are characterized by continuous collaborations with national and international companies and universities.

See [www.navsas.eu](http://www.navsas.eu) for details.

**Biography**

Antonio Defina is a senior researcher of the NavSAS Group at ISMB, where he is a technical responsible for the development of innovative technologies for applications. Prior to join NavSAS Group in 2005, he received the Master Degree in Communications Engineering from Politecnico of Torino in July 2005.

His research interests mainly cover the field of GNSS systems that exploit navigation and communication features for obtaining added value services in different sectors. His activities are focused on software and firmware design and their implementation on prototypes in the frame of national and international projects. Moreover he is strongly involved in the creation and maintenance of development tools able to support GNSS research activities.

**Distinguished Lecture: Cooperation at the Network level**

**Speaker:** Prof. Anthony Ephremides, University of Maryland

**Venue:** University of Queensland

**Date:** 18th December 2009

**Time:** TBA

**Abstract**

The concept of cooperative transmissions in a wireless network evolved from the notion of the relay channel and the MIMO technology. Most of the work to date has focused on physical layer techniques (such as decode-and-forward and the like) and aimed at characterizing the source-to-destination Information-theoretic Capacity.

We take a different view and exploit the possibility of relaying in a cognitive fashion. That is, we sense unused resources (time-slots and/or frequency bands) and make opportunistic use of these resources for relaying.

We consider packets and slots rather than bits and seconds and thus our approach focuses on computing throughput, rather than capacity. In fact, we consider the realistic and practical case of finite delays, and, hence, bursty source traffic; thus we focus on the "stable throughput" region that can be achieved in a network with or without relaying. We find that significant improvements can be achieved if such cooperative/cognitive methods are used. And in fact we also consider superposing on these methods the more familiar physical layer schemes (such as combining, decode-and-forward, etc) and show that we can achieve, as expected, even further gains.

We then look at cooperative routing in sensor networks (a totally different concept of cooperation, again at the network level) and identify some remarkable consequences in that case.

These novel ideas and methods are the beginning of what we call "cooperation at the network level"; the potential exists that, through such cooperation, far-reaching implications may follow with regard to achievable transmission rates under bursty traffic conditions.



**Bio**

Anthony Ephremides holds the Cynthia Kim Professorship of Information Technology at the Electrical and Computer Engineering Department of the University of Maryland in College Park where he holds a joint appointment at the Institute for Systems Research, of which he was among the founding members in 1986. He obtained his PhD in Electrical Engineering from Princeton University in 1971 and has been with the University of Maryland ever since.

He has held various visiting positions at other Institutions (including MIT, UC Berkeley, ETH urich, INRIA, etc) and co-founded and co-directed a NASA-funded Center on Satellite and Hybrid Communication Networks in 1991. He has been the President of Pontos, Inc, since 1980 and has served as President of the IEEE Information Theory Society in 1987 and as a member of the IEEE Board of Directors in 1989 and 1990. He has been the General Chair and/or the Technical Program Chair of several technical conferences (including the IEEE Information Theory Symposium in 1991 and 2000, the IEEE Conference on Decision and Control in 1986, the ACM Mobihoc in 2003, and the IEEE Infocom in 1999). He has served on the Editorial Board of numerous journals and was the Founding Director of the Fairchild Scholars and Doctoral Fellows Program, a University-Industry Partnership from 1981 to 1985.

He has received the IEEE Donald E. Fink Prize Paper Award in 1991 and the first ACM Achievement Award for Contributions to Wireless Networking in 1996, as well as the 2000 Fred W. Ellersick MILCOM Best Paper Award, the IEEE Third Millennium Medal, the 2000 Outstanding Systems Engineering Faculty Award from the Institute for Systems Research, and the Kirwan Faculty Research and Scholarship Prize from the University of Maryland in 2001, and a few other official recognitions of his work.

He is the author of several hundred papers, conference presentations, and patents, and his research interests lie in the areas of Communication Systems and Networks and all related disciplines, such as Information Theory, Control and Optimization, Satellite Systems, Queueing Models, Signal Processing, etc. He is especially interested in Wireless Networks and Energy Efficient Systems

## Contact List of your Volunteer Office Bearers for 2009

NOTE: full contact details may be found at <http://www.ewh.ieee.org/r10/queensland/OfficeBearers.html>

### Chair

Mr. Abbas Bigdeli  
National ICT Australia Ltd.  
Email: [abbas.bigdeli@ieee.org](mailto:abbas.bigdeli@ieee.org)

### Vice-Chair

Mr Roelof Swanepol  
Email: [roelofs@ieee.org](mailto:roelofs@ieee.org)

### Immediate Past-Chair

Assoc. Prof. Vaughan Clarkson  
The University of Queensland  
School of Information Technology and Electrical Engineering (ITEE)  
Email: [v.clarkson@itee.uq.edu.au](mailto:v.clarkson@itee.uq.edu.au)

### Secretary

Mr. Bart Sedgwick  
AECOM  
Email: [bart.sedgwick@aecom.com](mailto:bart.sedgwick@aecom.com)

### Treasurer

Dr. Jasmine Banks  
Queensland University of Technology  
School of Engineering Systems  
Email: [j.banks@qut.edu.au](mailto:j.banks@qut.edu.au)

### Newsletter Editor

Mr. Robert Ellen  
Email: [rellen@ieee.org](mailto:rellen@ieee.org)

### Webmaster

Mr. Ashkan Boldaji  
Email: [aboldaji@ieee.org](mailto:aboldaji@ieee.org)

### IEAust Liaison

Prof. Tapan Saha, UQ School of ITEE  
Email: [saha@itee.uq.edu.au](mailto:saha@itee.uq.edu.au)

### Chapter Chairs and Committee Coordinators

#### Chair, Computer Chapter

Mr. Simon Ellis  
Email: [ellis777@bigpond.net.au](mailto:ellis777@bigpond.net.au)

#### Vice-Chair, Computer Chapter

Dr. Philip Machanick  
Email: [philip.machanick@gmail.com](mailto:philip.machanick@gmail.com)

#### Chair, Power & Energy Chapter

Jose Lopez-Roldan  
Powerlink  
Email: [jlopez-rolan@powerlink.com.au](mailto:jlopez-rolan@powerlink.com.au)

#### Vice-Chair, Power & Energy Chapter

Prof. Tapan Saha, UQ School of ITEE  
Email: [saha@itee.uq.edu.au](mailto:saha@itee.uq.edu.au)

#### Chair, Joint Chapter Control Systems / Robotics & Automation

Assoc. Prof. Duncan Campbell  
QUT, School of Engineering Systems  
Email: [da.campbell@qut.edu.au](mailto:da.campbell@qut.edu.au)

#### Vice Chair, Joint Chapter Control Systems / Robotics & Automation

Prof. John Billingsley  
Faculty of Engineering and Surveying  
University of Southern Queensland  
Email: [billings@usq.edu.au](mailto:billings@usq.edu.au)

#### Chair, Joint Chapter Signal Processing / Communications

Dr. Garry Einicke  
CSIRO Exploration and Mining  
Email: [Garry.Einicke@csiro.au](mailto:Garry.Einicke@csiro.au)

#### Vice-Chair, Joint Chapter Signal Processing / Communications

Dr. Dhammika Jayalath  
QUT, School of Engineering Systems  
Email: [dhammika.jayalath@qut.edu.au](mailto:dhammika.jayalath@qut.edu.au)

#### Secretary, Joint Chapter Signal Processing / Communications

Mr. Shivanajay Marwaha  
Email: [smarwaha@itee.uq.edu.au](mailto:smarwaha@itee.uq.edu.au)

#### Chair, Joint Chapter Microwave Theory & Techniques / Antennas & Propagation

Dr. Aleksandar Rakic  
The University of Queensland, School of ITEE  
Email: [rakic@itee.uq.edu.au](mailto:rakic@itee.uq.edu.au)

#### Vice-Chair, Joint Chapter Microwave Theory & Techniques / Antennas & Propagation

Dr. Karla Ziri-Castro  
QUT, School of Engineering Systems  
Email: [karla.ziricastro@qut.edu.au](mailto:karla.ziricastro@qut.edu.au)

#### Chair, Computational Intelligence

Dr. Marcus Gallagher  
UQ, School of ITEE  
Email: [marcusg@itee.uq.edu.au](mailto:marcusg@itee.uq.edu.au)

#### Vice-Chair, Computational Intelligence

Mr. Michael Blumenstein

**Chair, Aerospace and Electronic Systems Chapter**

Mr Robert Ellen  
Email: [rellen@ieee.org](mailto:rellen@ieee.org)

**Vice-Chair, Aerospace and Electronic Systems Chapter**

Professor Peter Lindsay  
UQ, School of ITEE  
Email: [p.lindsay@itee.uq.edu.au](mailto:p.lindsay@itee.uq.edu.au)

**Secretary, Aerospace and Electronic Systems Chapter**

Mr John Davies  
Email: [davies71@bigpond.net.au](mailto:davies71@bigpond.net.au)

**Chair, Engineering in Medicine and Biology Chapter**

Dr. Mohan Karunanithi  
e-Health Research Centre  
Email: [Mohan.Karunanithi@csiro.au](mailto:Mohan.Karunanithi@csiro.au)

**Vice-Chair, Engineering in Medicine and Biology Chapter**

A/Prof. Stephen Wilson  
UQ School of ITEE

**Secretary, Engineering in Medicine and Biology Society Chapter**

Dr. Daniel James  
Griffith University, School of Engineering  
Email: [d.james@griffith.edu.au](mailto:d.james@griffith.edu.au)

**Student Activities Chair**

Dr. Mark Griffin  
UQ, School of Population Health  
Email: [m.griffin@uq.edu.au](mailto:m.griffin@uq.edu.au)

**Awards & Recognition Chair**

Mr. Michael Lees  
Foster's Australia  
Email: [Michael.Lees@ieee.org](mailto:Michael.Lees@ieee.org)

**Chair, GOLD Affinity Group**

Mr Robert Ellen  
Email: [rellen@ieee.org](mailto:rellen@ieee.org)

**Vice-Chair, GOLD Affinity Group**

Mr Roelof Swanepol  
Email: [roelofs@ieee.org](mailto:roelofs@ieee.org)

**Student Branches/Student Counsellors****Student Branch Counsellor, Griffith University - Gold Coast**

Mr. Charles Hacker  
Griffith University, Gold Coast Campus  
School of Engineering  
Email: [C.Hacker@griffith.edu.au](mailto:C.Hacker@griffith.edu.au)

**Student Branch Counsellor, Griffith University - Nathan**

Dr. Yongsheng Gao  
Griffith University, Nathan Campus  
School of Microelectronic Engineering,  
Email: [yongsheng.gao@griffith.edu.au](mailto:yongsheng.gao@griffith.edu.au)

**Student Branch Counsellor, Queensland University of Technology**

Dr. Jasmine Banks  
Email: [j.banks@qut.edu.au](mailto:j.banks@qut.edu.au)

**Student Branch Counsellor, The University of Queensland**

Assoc. Prof. Vaughan Clarkson  
Email: [v.clarkson@itee.uq.edu.au](mailto:v.clarkson@itee.uq.edu.au)

**Student Branch Counsellor, Central Queensland University**

Dr. Shawkat Ali  
Central Queensland University  
School of Computing Sciences  
Email: [s.ali@cqu.edu.au](mailto:s.ali@cqu.edu.au)

**Student Counsellor, University of Southern Queensland**

Dr. Tony Ahfock  
USQ, Faculty of Engineering & Surveying  
Email: [ahfock@usq.edu.au](mailto:ahfock@usq.edu.au)