



INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC.
(ARBN 078 576 495)

QUEENSLAND SECTION

2015 ANNUAL REPORT SUBMITTED TO REGION 10

Based on a report originally presented at the
Queensland Section AGM on 2 December 2015

PART A – SECTION SUMMARY

A.1 Executive Summary

• SECTION EXECUTIVE COMMITTEE MEMBER LIST

Position	Officer
Chair	Garry Einicke
Vice Chair	Daniel Eghbal
Secretary	Tony Sahama
Treasurer	Mike Robinson
Immediate Past Chair	Tapan Saha
Newsletter Editor	Hugo G. Espinosa
Webmaster	Mike Robinson
Professional Activities	Alireza Jolfaei
Membership Development chair	Yateendra Mishra
Awards & Recognition	Preethi Chandra
Student Activities Chair	Ranju Manda
Educational Activities Chair	Kalum P. Udagepola
Engineers Australia Liaison	Tapan Saha
TISP	Mike Robinson
Women in Engineering (Chair)	Alexandra Posoldova
Women in Engineering (Vice chair)	Bafrin Zarei
Women in Engineering (Secretary)	Marie Luise Wille
Aerospace and Electronic Systems Chapter (Chair)	Robert Kennedy
Aerospace and Electronic Systems Chapter (VC)	Ken Morris
Aerospace and Electronic Systems Chapter (Sec)	John Davies
Computational Intelligence Chapter (Chair)	Andrew Lewis
Computational Intelligence Chapter (VC)	Amin Gharipour
Computational Intelligence Chapter (Sec)	Zahra Jadidi
Computer Chapter (Chair)	Tomasz Piotr Bednarz
Computer Chapter (VC)	Ruslan Puscasu
Computer Chapter (Sec)	Mike Robinson
Control Sys/Robotic & Auto Chapter (Chair)	Michael Kearney
Control Sys/Robotic & Auto Chapter (VC)	James Brodie
Engineering in Medicine & Biology Chapter (Chair)	Stephen Wilson
Engineering in Med & Biology Chapter (VC)	Mohanraj Karunanithi
MTT/AP Chapter (Chair)	Greg Hislop
MTT/AP Chapter (VC)	Konstanty Bialkowski
MTT/AP Chapter (Secretary)	Antony Lui
Power & Energy Chapter (Chair)	Chandima Ekanayake
Power & Energy Chapter (VC)	Nilesh Modi
Power & Energy Chapter (Secretary)	Ruifeng (Richard) Yan
Power and Energy Chapter (Student rep)	Jaroslav Krata
Signal Processing & Comms Chapter (Chair)	Andrew Bradley
Signal Processing & Comms Chapter (VC)	Vaughan Clarkson
Signal Processing & Comms Chapter (Sec)	Dharmika Jayalath
Young Professionals Affinity Group (Chair)	Mohammad Amanzadeh
Young Professionals Affinity Group (VC)	Reuben Peterkin
Young Professionals Affinity Group (Sec)	Rob Makaremi
Student Counsellor QUT	Seyit Camtepe
Student Counsellor UQ	Rahul Sharma
Student Counsellor GU-GC	Jahangir Hossain
Student Counsellor GU-Nathan	Sascha Stegen
Student Counsellor USQ	Paul Wen
Student Counsellor CQU – Brisbane	Mary Tom
Student Counsellor CQU – Rockhampton	Edward Palmer

• SECTION HIGHLIGHTS

- Based on the latest available statistics, our current membership stands at 1174, which is about a 1% increase from the same time last year (1167). Practically our membership has been very stable.
- In 2015, we are pleased to see that some chapters exceeded the expectation and had an outstanding performance. Most organisational units (chapters and affinity groups) hosted by the Section have held at least two meetings in 2015 required for official 'active' status. Queensland chapters and affinity groups organised over 60 events with a total of 1329 attendees.
- A number of Chapters have performed outstandingly during this year. Power & Energy Society Chapter, Joint Chapter of Microwave Theory and Techniques/Antennas and Propagation & Joint Chapter of Signal Processing and Communications have provided very high level of professional service to our section members. On behalf of QLD section I would like to congratulate the committees of these chapters for their outstanding performance.
- The Queensland Section has had a successful year, hosting three major events:
 - o *The Queensland Section 30-year-celebration*: A committee led by Professor Tapan Saha organised three 30-year celebration events, namely: a student poster competition, a 30-year commemoration event held at The University of Queensland, and a formal anniversary dinner held at the Brisbane Convention and Exhibition Centre. It was a pleasure to have our first Chairs - Professors David Thiel, Miles Moody and Matt Darveniza, speak about their experiences from the mid- 1980s to the present. The Section gratefully acknowledges the generosity of the event sponsors: The University of Queensland, Queensland University of Technology, University of Southern Queensland, GroundProbe, and NOJA Power
 - o *The International Conference on Acoustics Speech and Signal Processing (ICASSP)*: Associate Professor Vaughan Clarkson was General Co-Chair for ICASSP, which is the Signal Processing Society's largest and most comprehensive conference. This two-million-dollar event was held in April 2015 at the BCEC and attracted more than 1,700 delegates. Congratulations to Vaughan and his team for managing such a mammoth task so successfully.
 - o *The Asia-Pacific Power and Energy Engineering Conference (APPEEC)*: The IEEE Queensland Joint Chapter of Power & Energy and Dielectrics & Electrical Insulation hosted IEEE APPEEC 2015, which was sponsored by the IEEE Power & Energy Society. Professor Tapan Saha and Professor Gerard Ledwich were the co-chairs of the conference, which was held at the BCEC in November 2015. We are fortunate indeed to have had another team of volunteers diligently working behind the scenes to make this event a great success.
- Student members account for almost 18% of our members and are future leaders of IEEE and the industry. Queensland section provides its full support to student branches. Currently, the student branches have mixed level of activities. University of Queensland student's branch organised five successful events and they are to be congratulated. A young team of enthusiastic volunteers at Griffith University joined the team in mid 2015 and organised three successful events. The Section also actively continued to promote student activities and membership drive functions.
- In 2015, Queensland section established a new category of thesis award for undergraduate students. Similar to previous years, the annual undergraduate thesis prize competition was before the AGM on December 2015 and three undergraduate students (from The University of Queensland and Griffith University) were awarded with IEEE Student Thesis Award.
- In 2015, ten executive committee meetings were held, plus the AGM. QLD Section committee meetings were organised at the University of Queensland, St. Lucia campus in Brisbane. The section had very good attendances in the meetings and provided opportunities for distant members to attend the meetings through teleconference/Skype as in previous years.
- Queensland section chapter officers have written articles for Region 10 newsletters. This is a great way to publicize our work in Region 10.
- The section vice-chair attended the Region 10 Section Chairs meeting in Dhaka, Bangladesh in March 2015. This provided him a great opportunity to meet the Region 10 leadership team and IEEE Headquarters office bearers. Despite the huge effort and time that Queensland section put to host the IEEE Region 10 Section Chair meeting in the Gold Coast, the proposal was rejected due to higher cost compare to South East Asia.

- The Queensland section chair/vice-chair regularly attended the Australia Council meetings in 2015 in order to coordinate with other Australian sections. Prof Tapan Saha (QLD Section immediate past chair is the current chair of IEEE Australia Council).
- Queensland section has built a strong collaboration with the local engineering professional organisations; Engineers Australia and IET. QLD section immediate past chair attended most of Engineers Australia's Queensland Electrical Branch meetings as the immediate Past Chair of the Electrical Branch and IEEE liaison officer.
- The Queensland Section's finances are in good condition with substantial savings and a reasonable operating fund.
- After the successful Senior Membership Elevation event that the section had organised in 2014, the number of section's senior members increased significantly. Currently, QLD section has 128 senior members. This number has been growing slowly and more elevation events will be planned for 2016 to facilitate the senior membership elevation process.
- In 2015, the MTT/AP joint chapter hosted 14 events for the calendar year. This includes a wide range of topics relating to the diverse interests of our chapter.
- PES/DEIS chapter Organised 11 events and was recognized as one of the High Performing Chapters under the High Performing Chapters Programs in 2015. PES chapter was also recognized as a Runners-up chapter for 2015 Outstanding Large Chapter Award (This is the fifth year that PES chapter has won this award).
- Queensland section has been promoting the recently established IEEE Collabratec. Section committee members have joined and a community page has been created for the section. In 2016, the page will be advertised via our newsletter and direct email to members to attract more members. IEEE Collabratec provide another opportunity for member to network, collaborate and create.

A.2 Financial Report from treasurer

In office: Mike Robinson

Overall:

There have been significant changes in the 2015 accounts from those of 2014. The net worth of the section is 20% higher this year than it was last year.

Expenses are approximately the same for both years, but income in 2015 is 20% higher due to extraordinary circumstances.

The opening balance of the cheque account was \$21,514.50 on December 1st 2014, and the closing balance was \$13,040.06 on November 30th 2015.

A new \$10,000 term deposit account was opened in 2015, bringing the total value of term deposits to over \$100,000.

Expenses:

Outside of the 30th Anniversary celebrations, the main expense items were the same as last year: Student activities: \$1,125, and student prizes \$3,500.

Chapter expenses: almost \$6,000. Chapter income by way of IEEE rebates: \$3,800.

AGM costs: \$2,750 versus income of \$1,640.

Administration costs: \$2,500.

Income (approximate):

Income from the IEEE membership rebate was almost \$3,000 higher due to currency fluctuations.

Income from external sources increased. The IPIC 2013 conference donated over \$9,000 to the section, and ICASSP 2015 donated another \$10,000. The donations were in return for providing ABN and GST accounting facilities to the conferences. This is a healthy future source of income for the section.

The 30th Anniversary celebrations also produced a small surplus from corporate sponsorship, and interest earned on term deposits increased by about 75%.

Recommendations:

The section's financial affairs are analysed for the AGM each year and get little scrutiny thereafter. The new committee should examine the accounts early in 2016, looking for trends both good and bad.

2015 FINANCIAL REPORT

PERIOD: 1ST DECEMBER 2014 - 30TH NOVEMBER 2015

PREPARED BY MIKE ROBINSON, TREASURER 2015 - 2016

INCOME		EXPENSES	
IEEE Rebates		Travel	
Annual Rebate 2015 (USD 8,574.60)	11,775.06	Han Zhang Student Congress Thailand	651.59
R10 WiE Support Fund	744.01	Administration	
PES Outstanding chapter 2014	298.77	Meeting catering expenses	1,917.73
APS Chapter rebate	621.94	Australia Council Levy	601.50
MTT Chapter rebate	622.51	Engineers Australia sponsorship	650.00
Unidentified rebates	1,543.22	30th Anniversay costs	12,452.45
2014 AGM dinner payments	880.00	Student thesis prizes	1,500.00
2015 AGM dinner payments	1,440.00	Postgraduate awards	2,000.00
30th Anniversay		2014 AGM	
Sponsorship	8,000.00	St Leo's College catering	2,564.00
Dinner payments	4,630.00	Sundry expenses	187.67
Interest received		2015 AGM	148.50
Transferred to Access Account	450.36	Student branches	1,125.86
Reinvested in Term Deposits	3,069.05	Chapters & Affinity Groups	
Other Income		AESS	335.00
ICIP 2013	9,023.79	CIS	500.00
ICASSP 2015	10,000.00	CS	119.35
		CSS/RAS	177.00
		EMBS	105.90
		MTT/AP	1,641.50
		PES/DEIS	1,520.50
		SP/CS	766.25
		WiE	799.68
		YPP	178.11
		Sundry sponsorship	327.78
Total Income	<u>53,098.71</u>	Total Expenses	<u>30,164.47</u>

2015 FINANCIAL REPORT

Assets as at November 30th 2015	
MECU Accounts	
Access Account	13,040.06
Term Deposit 138322014 @ 2.95% matures February 17th 2017	26,088.08
Term Deposit 138356429 @ 2.9% matures May 26th 2015	20,000.00
Term Deposit 138357658 @ 3.05% matures November 24th 2015	10,000.00
Term Deposit 307188228 @ 2.75% matures September 13th 2016	24,760.47
Term Deposit 307188229 @ 2.65% matures January 13th 2016	20,188.71
Total cash at bank	114,077.32
Total assets	<u>114,077.32</u>
Long-term Liabilities	
8/01/2012 IEEE Reserve Allocation	5,779.87
7/01/2013 IEEE Reserve Allocation	5,303.01
8/01/2014 IEEE Reserve Allocation	591.22
Total liabilities	<u>11,674.10</u>
Net worth	<u><u>102,403.22</u></u>
AESS	AEROSPACE AND ELECTRONIC SYSTEMS SOCIETY
CIS	COMPUTATIONAL INTELLIGENCE SOCIETY
CS	COMPUTER SOCIETY
CSS/RAS	CONTROL SYSTEMS/ROBOTICS AND AUTOMATION SOCIETIES
EMBS	ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY
MTT/AP	MICROWAVE THEORY AND TECHNIQUES/ANTENNAS AND PROPAGATION SOCIETIES
PES/DEIS	POWER AND ENERGY/DIELECTRICS AND ELECTRICAL INSULATION SOCIETIES
SP/CS	SIGNAL PROCESSING AND COMMUNICATIONS SOCIETIES
WIE	WOMEN IN ENGINEERING
YPP	YOUNG PROFESSIONALS PROGRAM

PART B – ORGANIZATIONAL ACTIVITIES

B.1 MEMBERSHIP DEVELOPMENT ACTIVITIES

In office: Dr. Yattendra Mishra

Based on the latest available statistics our current membership number is 1174. Table below summarises the total membership distribution in Queensland.

IEEE Grade	Number of members	Percentage (%)
Associate Member	13	1.11
Fellow	1	0.09
Graduate Student Member	145	12.35
Student Member	71	6.05
Life Member	24	2.04
Life Senior	11	0.94
Senior Member	128	10.90
Member	781	66.52
Total	1174	

In the year 2014, IEEE Queensland section initiated a senior membership elevation program to facilitate the process of membership elevation. This was a very successful event and almost doubled the number of senior members.

Reviewing the membership information reveals that:

- 1- The decline in student membership was the biggest this year.
- 2- A recent decline in IEEE's membership trend is not only unique to Queensland Section but also to all sections throughout Australia.
- 3- High dropout rates and lower numbers of secondary students interested in entering engineering studies may be another reason for the declining trend.

Based on these observations, below strategies are proposed to move forward:

1. Roll out membership development initiatives to raise the awareness and visibility of IEEE.
2. Engage with existing members. The coming months will be crucial for member retention.
3. Convert students to higher-grade membership to retain them.
4. Elevate ordinary members to Senior Membership to instil a sense of loyalty and belonging to IEEE.
5. Form sub-committees for membership development with focus on young professionals, students. It is crucial to focus on these specific member grades in the section's membership development activities.

B.2 Chapter Activities

Below is the list of active chapters/joint chapters in QLD Section.

Chapter Title
Aerospace and Electronic Systems Society
Computational Intelligence Society
Computer Society
Control Systems/Robotics & Automation Society
Engineering in Medicine & Biology Society
Microwave Theory and Techniques Society/Antennas and Propagation Society Joint Chapters
Power & Energy Society and Dielectrics and Electrical Insulation Society Joint Chapters
Signal Processing & Communications Society

Following sub-sections summarise each chapter activity.

B.2.1 AEROSPACE AND ELECTRONIC SYSTEMS CHAPTER

Office Bearers:

Chair: Robert Kennedy

Vice-chair: Ken Morris

Secretary: John Davies

The IEEE Queensland Aerospace and Electronic Systems chapter held two events in 2015. Both were state of the-art events and the high-capacity audiences reflected this fact.

The first event was held on May 12th at the Science and Engineering Building at QUT, Gardens Point campus. Dr John Norgard from NASA presented a talk about space exploration and an overview of NASA's past, present, and future missions, with an emphasis on EMI problems and EMC solutions.

The past mission of NASA was to design and build the Space Shuttle (SS), which was used to construct the

International Space Station (ISS). The present mission of NASA is to support the ISS with new equipment,

supplies, and crew changes.

The future mission of NASA is to analyse and design a new blunt-body re-entry vehicle to replace the decommissioned SS, providing a crew-exploration vehicle to operate past the orbit of the ISS, and eventually to fly to the Moon and Mars.

On October 2nd Dr Garry Einicke presented a lecture on "Improved image and signal filtering techniques for tracking mining equipment". The venue was the Science and Engineering Building at QUT, Gardens Point campus. Garry presented two improved filtering techniques, which have been accepted for publication in the IEEE Transactions on Aerospace and Electronic Systems and IEEE Transactions on Signal Processing.

First, the optimum minimum-variance filter and smoother are generalized to include Poisson distributed-measurement noise components. Second, a linear-state space model was described, whose second-order moments match that of a hidden Markov chain. An optimal minimum-variance filter and smoother was derived to recover the Markov chain states from noisy measurements

B.2.2 COMPUTATIONAL INTELLIGENCE SOCIETY

Office Bearers:

Chair: Andrew Lewis

Vice-chair: Amin Gharipour

Secretary: Zahra Jadidi

The Computational Intelligence Society chapter started the year with a Distinguished Lecturer seminar presented by Professor James Bezdek in April. Jim is highly regarded in IEEE CIS in S.E. Queensland from his earlier visits, and this meeting proved no exception, with some 30 students and academics attending. Jim presented a method for generalising any classical paired-comparison cluster validity index (PC-CVI) so that it can be used to evaluate soft (fuzzy/probabilistic) partitions of numerical data. A Life Fellow of IEEE, Jim is well-known for developing the fuzzy c-means (FCM) algorithm, considered as one of the most important discoveries in fuzzy pattern recognition, and the clustering algorithm of choice for most practitioners in fuzzy exploratory data analysis.

The PhD students who attended described the talk as useful in their own research, in no small part because of Jim's accessible and knowledgeable presentation.

In July Dr Hamid Mirfenderesk, Coordinator of the Gold Coast City Council Management Team and Adjunct Associate Professor at Griffith University, presented a seminar on "An enhanced Flood Forecasting and Decision Support System for the Gold Coast". The presentation introduced a framework for a flood emergency decision support system that is based on model-driven projections whose outputs can be readily presented using often freely available web-based applications. About 20 students and academic staff attended, finding the presentation informative with several questions from the audience in the discussion that followed.

In September, Dr Amir Etemad-Shahidi, Griffith School of Engineering, presented a seminar on "Computational Engineering Applications in Water Engineering". Rather than the traditional, regression-based methods, Dr Etemad-Shahidi described data-driven systems that attempt to find relationships between input and output parameters based on observation data and computational intelligence techniques, including artificial neural networks and decision trees. Some 25 students and staff attended. These seminars were video conferenced between Griffith's Gold Coast campus and Nathan campus in Brisbane.

We intend to continue this as standard practice with most seminars in future, and hope that more of our Brisbane colleagues can take advantage of this at seminars in 2016.

The final event of the year was a CIS Colloquium in November, at Griffith University Gold Coast campus, with presentations from three researchers from Griffith, QUT and UQ. Prof. Michael Blumenstein (GU) opened the meeting with a presentation on "Solving the world's problems through Computational Intelligence – challenges at the frontiers of Pattern Recognition research."

Harnessing ground breaking developments in the areas of automated pattern recognition, video and image processing, Michael presented applications in automated document analysis systems, the development of automatic systems for monitoring the activities of visitors at our beaches and coastal zones, and software tools that can be used for the early diagnosis and treatment of such brain disorders as Parkinson's disease. He was followed by an interesting and engaging presentation by Dr Jürgen Leitner (QUT) on "Robotic Vision: a Vision for Robotics". Juxi spoke of developing robot abilities to adapt to unstructured changing environments through bio-inspired computational methods, and discussed the enormous impact of computer vision on robot autonomy, adaptability and intelligence. Prof. Geoff McLachlan (UQ) closed the colloquium with the presentation "On Modelling and Clustering via Mixture Models". Finite mixture models are being widely used in practice to provide a model-based approach to the modelling and clustering of heterogeneous data, and his presentation generated considerable interest from image analysis researchers at the meeting. About 30 students and academic staff attended the colloquium, and there were lively discussions with all presenters following over lunch. We hope to make the colloquium an annual fixture in the CIS calendar in Queensland, and welcome participation from all IEEE members and guests.

Amin Gharipour, CIS Chapter Vice-Chair for 2015, must be thanked for his efforts in organising many of these events, along with assistance from Zahra Jadidi, Chapter Secretary. Plans are already underway for a series of seminars in 2016, on the general theme of “Big Data”, and we look forward to seeing participation and engagement with activities in this topical area.

B.2.3 COMPUTER SOCIETY CHAPTER

Office Bearers:

Chair: Tomasz Bednarz

Vice-chair: Ruslan Puscasu

Secretary: Mike Robinson

The Computer Society chapter held its first planning meeting for 2015 on March 27th, when the committee met to discuss present issues and future activities.

Mike Robinson presented a report outlining the chapter’s status and the special problems it faced. These involved lack of communication with the membership in recent years, struggling to hold a minimum of two professional events each year, a distributed membership with diverse interests and requirements, lack of a CBD venue for functions, and inactive committees for the previous five years. Using their industry and academic contacts Tomasz Bednarz and Ruslan Puscasu proposed staging a series of monthly activities, starting at the end of May. It was also decided to establish at least one CS student branch at a Brisbane university. There hasn’t been a CS student branch at any university for more than 10 years.

The chapter held the following activities in 2015:

- A seminar on “Bayesian Statistics for the Big Data Age”, was held at Queensland University of Technology on May 21st. Professor Kerrie Mengersen from QUT conducted the seminar, which was followed by networking and refreshments.
- The second event jointly sponsored by the Brisbane GPU Meetup Group was held at Queensland University of Technology on September 17th. It featured an introduction to OpenGL by Tomasz Bednarz, the chapter chair, followed by an introduction to geometry shaders by Daniel Filonik. An informal dinner was held nearby.
- Mike Robinson conducted a seminar on responsive web design for 83 JavaScript programmers from the Brisbane JavaScript Meetup Group on October 12th.
- October 15th Mike Robinson conducted a seminar on responsive web design for 35 web developers from the Brisbane Web Design Meetup group. MJR presents RWD to 83 JavaScript enthusiasts.

Although the chapter was very active in 2015 compared to previous years, no progress was made on forming student branches.

B.2.4 CONTROL SYSTEMS / ROBOTICS AND AUTOMATION SOCIETY

Office Bearers:

Chair: Dr. Michael Kearney (The University of Queensland)

Vice-chair: James Brodie (Carlton and United Breweries)

The CS/RA Society chapter had four events this year.

These were all discussions around significant papers in the control and automation literature, which we dubbed Classical and Consequential Control Composition Conversation events. In these CCCCC events, a member would lead discussion around the paper before moving onto general control/automation discussions and dinner. The four papers were:

1. “On Governors” by the Scottish Physicist James Clerk Maxwell (Famous for Maxwell’s Equations). Published in 1866.
2. “Regeneration Theory” by H Nyquist. Published in 1934.
3. “A Simplified Derivation of Linear Least Square Smoothing and Prediction Theory” By H. W. Bode and C. E. Shannon. Published in 1950.

4. “Use of linear programming methods for synthesizing sampled-data automatic systems” by A.I. Propoi (translated from Russian) published in 1963.

Through attending these meetings we have been able see how some of the key ideas in control and automation, that form the basis of what we do, were first published and how they were developed over time. It was also interesting to see how the form of academic journal papers have also changed over time.

Thanks to all the members of the CS/RA chapter. Both James and I are stepping back next year and we want to wish all the best to the incoming committee of Luis Mejias Alvarez and Navida Kottege

B.2.5 ENGINEERING IN MEDICINE AND BIOLOGY CHAPTER

Office Bearers:

Chair: Stephen Wilson (The University of Queensland)

Vice-chair: Mohanraj Karunanithi (CSIRO)

EMBS has had a relatively quiet year with ongoing negotiations for major conferences and a number of professional events.

Noteworthy was our shared event with Queensland MTT/AP chapter which saw Distinguished Lecturer, Professor Robert Caverly speak on RF aspects of MRI and tour our labs and facilities.

EMBS also had a successful co-hosting of the ICET Lab Cardiovascular Engineering seminar which drew a national audience at The Prince Charles Hospital. This event, in conjunction with a BCEC-hosted dinner, was an ideal networking environment for local researchers, government, and industry.

The chapter has been active arranging hosting of the Medical Bionics Conference 2016, which will come to Brisbane for the first time.

In November 2015 the EMBS chapter had an event with 2 international speakers. One was a rehabilitation research scientist from the Department of Veteran Affairs, Tampa, Florida who presented on a smart home application for US army veterans.

The second was a Professor in Computer Science from Texas University, who presented her work on a context-aware middleware framework for the Internet of Things.

B.2.6 MICROWAVE THEORY AND TECHNIQUES/ANTENNAS AND PROPAGATION JOINT CHAPTER

Office Bearers:

Chair: Greg Hislop (Fugro Roames)

Vice-chair: Konstanty Bialkowski (The University of Queensland)

Secretary: Antony Liu (The University of Queensland)

Committee Member: Morteza Shahpari (Griffith University)

In 2015 the MTT/AP joint chapter was pleased to host 15 events for the calendar year. These included 13 seminars on a wide range of topics relating to the diverse interests of our chapter, as well as 2 of a new type of semi-technical/semi-social event called “Microwaves over dinner”.

Under the IEEE Distinguished Lecturer programs from both of our parent societies - MTT and AP - we were able to invite some well-known researchers to Brisbane and Australia. Each chapter in Australia has the potential to invite up to 2 speakers from the Distinguished Lecturer program in both the MTT and AP Societies. However, due to the long distances required to get to Australia, it is important that Distinguished Lecturers also visit other chapters in Australia during their visits. Therefore each of our speakers also visited several other chapters in Australia. We managed to get quite a few more speakers than last year due to careful collaboration with other chapters, encouraging their invitees to also visit Brisbane.

Our first Distinguished Lecturer from the MTT Society this year was Professor Robert Caverly from Villanova University, in March. He presented MRI from an RF or microwave perspective. Robert was

initially attracted to the area of MRI via his extensive experience with PIN diodes. Our next Distinguished Lecturer was from the AP Society, Professor Qing Huo Liu from Duke University. He gave two presentations: one in the morning at CSIRO, the other in the afternoon at UQ. Both talks were about using microwaves to image different bodies. The first talk was suited to resource applications such as underground oil; the second was about biomedical imaging applications.

In July we had two MTT Society Distinguished Lecturers. The first was Professor Mona Jarrahi. She presented on very efficient ways to generate Terahertz signals by mixing down optical frequencies using plasmonic techniques. The second was Professor Madhu Gupta, whose presentation was well-suited to a wide variety of people in different stages of their careers. The subject was microwave engineering, including its purpose and future. We should also mention that Brisbane-based company Micro sponsored a lunch after the event.

In August and October we had two more AP Society Distinguished Lecturers. The first was Professor Ahmed Kishk from Concordia University in Canada. He presented on dielectric resonator antennas and how they can be put into compact arrays for a variety of applications. The second, in October, was Professor Mats Gustavsson from Sweden, who talked about how, using convex optimisation, the current distribution of the optimum antenna within a fixed volume can be found. This is very useful when evaluating antenna designs in terms of how optimum they may be.

ISAP, the international conference - symposium on antennas and propagation, was held in Hobart, Australia, during November. In the week before the conference we hosted 3 speakers who were also visiting the conference. Two of these were AP Society Distinguished Lecturers, Dr Sudkhar Rao from Northrup Grumman and Professor Christophe Caloz from Montreal, Canada. Dr Rao presented several challenges which were already solved in on-satellite antennas in the past and some insight into the future of satellite antennas. Professor Caloz presented on leaky-wave antennas and how, with some novel structures, they can be used to achieve both excellent reconfiguration in beam direction, over an incredibly wide frequency range.

Some other highlights of this year were seminars and workshops in the topic areas of radar, optics, photonics and terahertz, medical applications of microwaves and antennas, and theoretical and computational electromagnetics and communications. Although a majority of our events were held at UQ we were also happy to host a few events at CSIRO in Pullenvale and Griffith University in Nathan.

All of the seminars were well-received and well attended, with a good mixture of IEEE members and guests. The MTT/AP joint chapter committee wishes to thank everyone for supporting our events during the year, and we look forward to seeing you at more events in 2016.

Seminars and Workshops in 2015

This year all seminars and workshops were recorded on the MTT/AP website.

February 6th (Griffith University): High Mobility Wireless Communications: Challenges and Opportunities, Professor Pingzhi Fan, Southwest Jiaotong University, China.

February 24th Talking Microwaves Over Dinner/Drinks: "Measuring ground permittivity in real time using dielectric loading and commercial GPR", led by Dr Greg Hislop, CSIRO.

March 26th (The University of Queensland): "RF Aspects of Magnetic Resonance Imaging", Professor Robert Caverly, Villanova University, PA, USA. (IEEE MTT Society Distinguished Lecturer).

March 31st Talking Microwaves Over Dinner/Drinks: "Reconfigurable Antenna Simulation", led by Dr Yifan Wang, The University of Queensland.

April 8th (The University of Queensland): "Modelling and design of THz quantum cascade laser active regions with an extended-density matrix formalism", Andrew Grier, University of Leeds, UK.

April 22nd (The University of Queensland): “Spatial interference mitigation for radio astronomical arrays”, Dr Gregory Hellbourg, CSIRO, Sydney.

May 11th (CSIRO): “Subsurface Sensing and Super-Resolution Imaging: Application of Computational Acoustics and Electromagnetics”, Professor Qing Huo Liu, Duke University (IEEE AP Society Distinguished Lecturer).

May 11th (The University of Queensland): “Progress and Challenges in Microwave Imaging and Microwave Induced Thermoacoustic Tomography”, Professor Qing Huo Liu, Duke University (IEEE AP Society Distinguished Lecturer).

July 28th (The University of Queensland): “New Frontiers in Terahertz Technology”, Associate Professor Mona Jarrahi, UCLA, CA, USA (MTT Society Distinguished Lecturer).

July 31st (The University of Queensland): “Microwave Engineering: What is it, where is it headed, and how it serves mankind”, Professor Madhu S. Gupta, UCSD, CA, USA (MTT Society Distinguished Lecturer).

August 17th (The University of Queensland): “Different Dielectric Resonator Antenna Arrays”, Professor Ahmed Kishk, Concordia University, Canada (AP Society Distinguished Lecturer).

October 19th (Griffith University): “Convex Optimization for Optimal Design and Analysis of Small Antennas”, Professor Mats Gustavsson, Lund University, Sweden (AP Society Distinguished Lecturer).

November 3rd (The University of Queensland): “Antenna Systems for 21st Century Satellite Communication Payloads”, Dr Sudkhar Rao, Northrup Grumman, CA, USA (AP Society Distinguished Lecturer).

November 4th (Griffith University): “A Comprehensive Understanding of Forward Scattering of Radar Beams by Wind Turbines”, Associate Professor Thomas Fickenscher, HSU, Germany.

November 5th (The University of Queensland): “Leaky-Wave Antennas: the Dawn of a New Era!”, Professor Christophe Caloz, cole Polytechnique de Montral (AP Society Distinguished Lecturer).

Conclusion

In closing, I would like to thank the 2015 MTT/AP committee for their support in running the chapter and in helping to organise a record number of events.

A special ‘thank you’ goes to Konstanty who has put a massive effort into the chapter in recent years. Over the last two years I have enjoyed my terms as Chair and Vice-chair but have stepped down from the committee, leaving it in good hands.

B.2.7 POWER AND ENERGY SOCIETY CHAPTER

In office:

Chair: Dr Chandima Ekanayake, Griffith University

Vice-chair: Dr. Nilesh Modi, AEMO

Secretary: Dr. Ruifeng Yan, The University of Queensland

UQ PES Student Branch Chair: Mr. Jaroslaw Krata

Highlights of 2015

1. Organised 11 events: 9 technical seminars, one international conference and 1 professional development seminar.
2. The PES chapter was recognized as one of the High Performing Chapters under the High Performing Chapters Programs in 2014. 84 chapters qualified for the award. Queensland was in 4th place in the overall list of winning chapters, in terms of the funding amount awarded, and in 2nd place (behind Malaysia) for non-US chapters.

3. The PES chapter was recognized as a Runner-up for the 2014 Outstanding Large Chapter Award. This is the fifth consecutive year that the PES Queensland chapter has won this award.
4. The PES Chapter awarded student travel prizes for two student members to attend and present papers at the 2015 IEEE PES General Meeting conference, held in Denver, CO, USA. Mr. Nahid-AI Masood and Mr. Sohel Uddin from The University of Queensland were the winners of the award. Each winner received a cheque for \$1000. Mr. Nahid-AI Masood also won the best student paper award at the conference.
5. Mr. Peter Price (Executive General Manager, Asset Management, Energex) was named 2014 IEEE PES Outstanding Engineer for professional activities and his contribution to the power and energy profession.
6. The PES chapter won the bid to hold the APPEEC 2015 conference in Brisbane. The conference was held at the Brisbane Convention and Exhibition Centre from November 15th to 18th, and was well-attended by local and international delegates.
7. The PES President-elect, Executive Director and the Region 10 PES representative visited Brisbane for APPEEC 2015, where they attended two industry seminars and a young professionals seminar.
8. The PES chapter provided technical assistance for the CIDER 2015 conference organised by CIGRE Australia.
9. The PES chapter Vice-chair attended the 2015 IEEE Region 10 chapter chairs meeting in Thailand.
10. The Outstanding Volunteer Award introduced by the PES chapter.
11. The IEEE Power and Energy Society appointed Professor Tapan Saha a Distinguished Lecturer.

Technical Seminars:

1. "R&D in the State Key Laboratory of Electrical Insulation & Power Equipment of China" by Professor Guan-jun Zhang from Xian Jiaotong University.
2. "Challenges for the electric utility industry" and "A brief overview of IEEE PES activities in support of solutions" by Dr. Damir Novosel, President-Elect; seminars at Powerlink and AEMO.
3. Power Engineering Software Workshop organised by The University of Queensland PES student branch.
4. "Electrical Insulation Research in the State Key Laboratory of Electrical Insulation and Power Equipment at Xian Jiaotong University of China" by Professor Kai Wu and Professor Yonghong Cheng from China's Xian Jiaotong University.
5. "Proposal for new electricity architecture, loose coupling and best mix of GRID and ECONetwork" by Mr. Satoshi Nagata.
6. A seminar on "Insulating polymeric dielectrics, past, present, and future" by Professor Len Dissado from the University of Leicester.
7. "Enhanced Power System Responsiveness through Load Control" by Professor Ian Hiskens, the University of Michigan at Ann Arbor, USA.
8. "Internet of Things and the Power Grid – Endless Possibilities" by Dr. Bala Natarajan.

APPEEC Conference report

The IEEE PES Asia-Pacific Power and Energy Engineering Conference 2015 was organised recently by the IEEE Queensland Section's PES-DEIS Chapter.

IEEE PES President-Elect Dr. Damir Novosel, IEEE PES Executive Director Mr. Pat Ryan and IEEE PES Region 10 representative Professor Lalit Goel attended the conference. Dr. Damir Novosel was the conference keynote speaker. He also conducted seminars at Powerlink and at AEMO.

326 papers were submitted, from which 258 papers were selected for presentations. 285 delegates registered for the conference from 22 countries, with 100 delegates from China. There was a significant attendance from industry, with 65 delegates from national and overseas power-industry organisations.

Several CEOs and senior power industry executives participated in the conference as plenary speakers. Mr. Terry Effeney (CEO, Energex, Australia), Mr. Mike Cleary (COO, AEMO, Australia), Mr. Peter McIntyre (Managing Director, TransGrid, Australia), and Professor Paul Simshauser (Director-General, Department of Energy & Water Supply, Queensland Government) were the panellists at the Monday morning session.

Tuesday's plenary session was moderated by Mr. Peter Price (EGM, Energex, Australia). The panellists were Mr. Stephen Richardson, (Technical and Innovation Engineer, Ergon Energy, Australia), Dr. Stuart Johnston (Executive Director, Assets and Network Transformation, ENA, Australia) and Dr. Perry Sioshansi (President, Menlo Energy Economics, USA). A conference banquet, City Lights Dinner Cruise, was held on the Kookaburra Queen paddle steamer.

Three industry site visits were organised for delegates: The University of Queensland's Gatton solar facility, NOJA Power's manufacturing facility, and the AEMO Control Centre.

We received strong support from Queensland industry, including a Gold sponsorship from NOJA Power, Silver sponsorships from Energex and Ergon Energy, and a Bronze sponsorship from Powerlink Queensland. Two special awards for papers were kindly donated by the Australian Power Institute and CIGRE Australia. Thanks to all our sponsors for their generous support.

PES Student travel award

The IEEE Queensland Power and Energy Society Chapter Student Conference Travel Prize was awarded to two recipients in 2015.

- Nahid Masood from The University of Queensland for presenting the paper entitled '*Frequency Response and its Enhancement using Synchronous Condensers in Presence of High Wind Penetration*' during the IEEE PES 2015 General Meeting, in Denver, USA.
- Sohel Uddin from The University of Queensland for presenting the paper entitled '*Capacity Constrained Energy Management for Unbalanced Distribution Systems*' during the IEEE PES 2015 General Meeting, in Denver USA.

PES Outstanding Engineer award

The IEEE PES Queensland chapter launched the Outstanding Engineer Award in 2010. In 2014 Mr Peter Price, Energex, was named outstanding engineer and the "IEEE Power and Energy Society of Queensland Outstanding Engineer Award" plaque was presented to him on July 16th 2015. Previous PES Outstanding Engineer Award recipients

2010 Dr. Jose Lopez-Roldan
 2011 Dr. Dave Allan
 2012 Professor Tapan Kumar Saha
 2013 Prof. Gerard Ledwich

PES Outstanding Volunteer Award 2015

The IEEE PES/DEIS Queensland chapter Outstanding Volunteer Award will recognize outstanding volunteers affiliated with the chapter. An award will be given each year starting in 2015.

B.2.7.1 IEEE PES UQ Branch Activities

In office:

Chair: Jaroslaw Krata

Vice-chair: Hanxiao Zhang

Student adviser: Tapan Saha

Major Activities for 2015

The following activities were organised during the year:

Welcome Event

Date: April 14th Attendance: 22

Speaker: Professor Tapan Saha, The University of Queensland

Students were introduced to the benefits of joining the IEEE and the IEEE Power and Energy Society by experienced members and a faculty staff member. IEEE membership was promoted during this event. Undergraduate students were especially encouraged to join the IEEE. The IEEE Queensland Section provided refreshments after the event.

Promotion Activity

Date: June 10th Visitors: over 35

A stall was set up at The University of Queensland Engineering Architecture and Information Technology postgraduate conference. The stall was manned all day long to attract visitors, and postgraduate students were encouraged to join the IEEE during the event. The IEEE attracted lots of attention from students with electrical and electronic backgrounds, as well as other backgrounds.

Software Tools Technical Workshop

Date: September 25th Attendance: 21

The PES student branch hosted its first software workshop

in September. The speakers were: Asif Islam (UQ PhD candidate), Hanxiao Zhang (UQ student), and Jaroslaw Krata (UQ PhD candidate). The workshop attracted 21 attendees, including undergraduate, master, PhD students, and research fellows.

Popular power system engineering software tools, especially PSS/E and PSCAD, were introduced to the audience, and some real simulation examples were presented and discussed.

The workshop was interactive and received positive feedback from the audience. The IEEE Queensland Section provided refreshments after the event.

Bridge between PES Leaders and Young Engineers

Date: November 16th Attendance: approximately 45

Young engineers from Queensland and the Asia Pacific region had an exceptional opportunity to meet distinguished IEEE Power and Energy Society guests during the APPEEC conference in Brisbane.

Speakers included: Dr Damir Novosel, IEEE PES

President-Elect, Mr. Patrick P. Ryan IEEE PES Executive Director,

Professor Lalit Goel, IEEE PES Regionl representative - Asia-Pacific.

The following topics were discussed during the event:

Leadership - advice from experienced, successful guests for young engineers; Breakthrough technologies that young IEEE engineers should explore; IEEE as a link between industry and universities – how to prepare students for industry careers, and how to enhance industry-university cooperation; The role of the IEEE in technology/product development. The event had a very interesting characteristic – semi-informal conversation between experienced IEEE PES leaders and young engineers starting on their career paths. The mutual understanding created a great, vibrant atmosphere, with many good ideas and advice for young engineers.

Summary of 2015 Apart from the activities listed above, it is important to mention other volunteering engagement of the IEEE PES UQ student branch. In February, during the official celebrations of the 30th anniversary of the IEEE Queensland Section, the PES UQ student branch provided 10 volunteers

to help with event organization. Similarly, 21 student branch volunteers provided organizational and other help during the IEEE APPEEC 2015 conference, which has been acknowledged by the organising committee.

B.2.8 JOINT CHAPTER OF SIGNAL PROCESSING AND COMMUNICATIONS

In office:

Chair: Professor Andrew Bradley (The University of Queensland)

Vice-chair: Dr. Vaughan Clarkson (The University of Queensland)

Secretary: Dr. Dhammika Jayalath (Queensland University of Technology)

The Journal Paper Club meetings, which were initiated by Vaughan Clarkson last year, continued throughout 2015. In these meetings the participants discuss a highly cited, ‘top ten’ or major-prize-winning article in a Signal Processing Society or Communication Society journal. In this way it is hoped that we broaden our understanding of the field.

The meetings also serve as an informal network in which researchers from local universities, industry, and government agencies are able to meet over a beer and share information about recent developments. Six regular Journal Paper Club meetings and one IEEE Day Special Edition meeting were held during 2015.

The chapter hosted two Distinguished Lecturers. Hamid Krim gave a presentation on “Convexity, Sparsity, Nullity and all that ... in Machine Learning”. Akio ‘Ken’ Sugiyama spoke on “25 Years of Audio Coding”.

Vaughan Clarkson was the General Co-Chair for the 40th IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2015 which was held in Brisbane from April 19th - 24th, 2015.

ICASSP is the world’s largest and most comprehensive technical conference focused on signal processing and its applications. The series is sponsored by the IEEE Signal Processing Society.

ICASSP 2015 was a huge success. Approximately 1,800 delegate attended, nearly 90% from overseas. The conference featured over 120 lecture and poster sessions. Excellent feedback was obtained from attendee survey responses. The chapter also hosted a special repeat of the ICASSP plenary by Professor Neil Gordon on missing Malaysia Airlines flight MH370 at The University of Queensland.

A seminar on “Deep Belief Networks” was given by Omid Ghahabi at Queensland University of Technology.

B.3 Professional and Continuing Education Activities

Alireza Jolfaie

Professional Activities Chair

I am completing my term as Chair of Professional Activities in the IEEE Queensland Section. My main role was to coordinate professional activities at the pre-university, university and engineering professional levels within the IEEE Queensland Section.

Although my responsibilities were very challenging, they were quite rewarding experiences.

This year we had a successful seminar by Dr Gwenael Doerr from Technicolor R&D France, which was held on April 20th at Griffith University, Gold Coast campus.

This talk was dedicated to informing enthusiastic IEEE members on how and why the entertainment industry invests considerable amounts of money in multimedia forensics. This seminar was engaging and was well received, and also raised many questions and comments from the audience.

I borrowed the idea of Journal Paper Club Meetings from the Signal Processing and Communication Societies Chapter, and initiated the same events, namely journal review sessions, in the Network Security Research group at Griffith University, Gold Coast campus.

We have had eight journal review sessions, in which the discussions were led by researchers from IBM, Cisco, and Griffith University. These seminars are detailed of as follows:

February 27th Dr Kalvinder Singh led a discussion on a paper by Ilenia Fronza et al.: “Failure prediction log files using Random Indexing and Support Vector Machines”, *Journal of Systems and Software*, vol. 86, no. 1, pp. 2-11, 2013.

March 27th Bafarin Zarei led a discussion on a paper by Uwe Maurer et al.: “Location and activity recognition using eWatch: A wearable sensor platform”, *In Ambient Intelligence in Everyday Life*, Springer Berlin Heidelberg, pp. 86-102, 2006.

April 24th Bryan Mcginty led a discussion on a paper by Ross Anderson: “Why cryptosystems fail”, *In Proceedings of the 1st ACM conference on Computer and Communications Security*, pp. 215-227, 1993.

May 29th Dr Muhammad Usman led a discussion on a paper by Chee-Wooi Ten et al.: “Vulnerability assessment of cybersecurity for SCADA systems”, *IEEE Transactions on Power Systems*, vol. 23, no. 4, pp. 1836-1846, 2008.

June 26th Patrick Crilly led a discussion on a paper by Hossein Mamaghanian et al.: “Compressed sensing for real-time energy-efficient ECG compression on wireless body sensor nodes”, *IEEE Transactions on Biomedical Engineering*, vol. 58, no. 9, pp. 2456- 2466, 2011.

July 31st Alireza Jolfaei led a discussion on a paper by Massimo Franceschet: “The role of conference publications in CS”, *Communications of the ACM*, vol. 53, no. 12, pp. 129-132, 2010.

August 26th Kamanashis Biswas led a discussion on a paper by Jing Deng et al.: “INSENS: Intrusion-tolerant routing for wireless sensor networks”, *Computer Communications*, vol. 29, no. 2, pp. 216-230, 2006.

October 27th Sultan Al Neyadi led a discussion on a paper by Michael Hart et al.: “Text classification for data loss prevention”, *In Privacy Enhancing Technologies*, Springer Berlin Heidelberg, pp. 18-37, 2011.

In closing I would like to thank the IEEE Queensland Section committee for giving me the opportunity to contribute as a volunteer to this community. I believe that IEEE Queensland Section has created a

very positive experience for its members at the preuniversity, university and engineering professional levels within the Queensland Section, and I look forward to its ongoing success into the future.

Prof. Kalum Udagepola

Educational Activities Chair

2015 was my first year as Educational Activities Chair. My main function is coordinating educational activities in the chapter.

Initially, I built strong inter-university connections to organize seminars that would improve university students' industrial experience at The University of Queensland, Queensland University of Technology, and Griffith University.

I planned three independent seminars, one at each university, but I could achieve only the QUT seminar. It was "Industry expectations - attitudes and attributes for success in engineering". In this seminar we discussed the current job market and employer expectations from job candidates.

The event started with a welcome from Dr Yateendra Mishra, where he introduced the Engineering Director at NOJA Power, Mr Jay Manne. Jay began by discussing experiences gained as a fresh graduate in his role as an assistant engineer for the South West Queensland Electricity Board in Dalby and Roma over four years.

He then joined Nulec Pty Ltd as a sales engineer and over the following 8 years became a service engineer and then Service Manager. Jay explained that he was one of the founding members of NOJA Power which was established in 2002. As Engineering Director he is responsible for all manufacturing and warehousing activities. Jay illustrated his journey from graduate to Engineering Director by recounting anecdotes associated with significant work-related events and detailing experiences he gained from those situations. During the presentation he introduced the pole mounted Auto Circuit Recloser manufactured by NOJA Power and used in electrical distribution networks worldwide.

Jay held the student's attention, describing how NOJA Power developed from a small business to become an international, multi-million dollar concern. A key part of their success was the development and ownership of the significant intellectual property utilised in NOJA products.

Jay finished by discussing his experiences as a young engineer facing interviews with employers, and explained what he expects when interviewing candidates for engineering positions.

In the subsequent questions session, Jay discussed his views regarding the future of electricity distribution and the changes that wide-spread use of renewables would bring. He also commented on the impacts that solar panels are having on distribution networks and the role of the smart-grid in improving network reliability and utilisation.

Overall the event was successful with students gaining an insight into what the future holds, and what actions need to be taken for a successful start to an engineering career.

B.4 Students Activities

B.4.1 STUDENT ACTIVITIES REPORT

In office: Ranju Manda

B.4.2 IEEE UNIVERSITY OF QUEENSLAND STUDENT BRANCH

In office:

Chair: Jeremy Taylor

Vice-chair: Michael Broe

Secretary: Elizabeth Deeb

Treasurer: MB Mhd Noor

Counsellor: Vaughan Clarkson (January - July)

Counsellor: Rahul Sharma (August December)

Power & Energy Chapter Chair: Jaroslaw Krata

Power & Energy Chapter Counsellor: Tapan Saha

Major activities

The University of Queensland's IEEE Student Branch continued to be active in 2015. Major activities for 2015 are summarized as follows:

1. A booth in the engineering precinct during orientation week.
2. Vacation Work and Careers seminar was held on March 23rd (73 attendees) with Laura Benn, Michael Broe, Jeremy Taylor and committee members from EBESS as speakers.
3. An information session about IEEE was held at the First Year Learning Centre on April 14th with Associate Professor Vaughan Clarkson and Mehdi Mosadeghy as speakers.
4. ICASSP 2015: Student Night was hosted by the UQ's IEEE Student Branch alongside the main conference with assistance from Vaughan at Tomahawk Bar on April 21st (99 attendees).
5. "Between Two Herberts: Making Ideas Happen" was held on August 14th with presentations from brothers Jeremy and Marcus Herbert (35 attendees).

Announcement

The student branch officers for 2016 will be Jeremy Taylor (Chair), Michael Broe (Vice-chair), Ellie Deeb (Secretary) and Ryan Boyle (Treasurer).

B.4.3 IEEE CQUNIVERSITY BRISBANE CAMPUS STUDENT BRANCH

In office:

Chair: Sujan Chowdhury

Secretary: Juan Munoz Carpio

Treasurer: Arash Esmaeili Daneshvar

Student counsellor: Dr. Mary Tom

Introduction

IEEE Student Branch Central Queensland University Brisbane Campus became operational in the second half of 2012. Establishing and keeping the branch active remains a challenging task due to the lack of engineering students on campus and the low number of ICT students. In spite of this, the branch is operational and the activities organised are well-attended by on-campus students, professionals, and students from neighbouring universities located in Brisbane city.

Major Activities for 2015

In 2015 the student branch organised one technical event and one professional activity as detailed below.

ICT Careers Evening Semester 1 *Date: April 29th* *Venue: CQUniversity Brisbane Campus*

This event was co-sponsored by the Australian Computer Society, which saved on running costs as well as obtaining improved attendance. Approximately 35 people attended the event, including ICT professionals, CQUniversity students, and students from neighbouring universities in Brisbane. Bob Waldie, Entrepreneur from Opendgear, shared his wealth of knowledge in becoming a successful entrepreneur and informed the audience about the risk and benefits of venturing into entrepreneurship. The second speaker, Dirk Hus, Business Solutions Manager, Brisbane Airport Corporation Pty Ltd, spoke on the structure and operation of BAC and explained how BAC recruits interns.

The third speaker, Barry Snashall, State Manager Australian Computer Society, provided the audience with essential knowledge about the new skills assessment of ICT professionals based on Skills Framework for Information Age (SFIA). Barry also explained the role of ACS in supporting ICT professionals and the benefits of becoming a member of the society. Oleg Lukin, an alumnus of CQUniversity and a successful ICT professional, engaged the audience with his expertise as a Business Intelligence developer.

Seminar on Software Testing Date: September 30th *Venue: CQUniversity Brisbane Campus*

This event was co-sponsored by the Australian Computer Society and the IEEE Student Branch CQUniversity Brisbane Campus. It was a well-received event with over 40 participants including students from two other universities in the Brisbane area, Griffith University and QUT. The event was chaired by Dr. Tom. Ash Conway presented a seminar entitled “The Power of Humans, Not Bots, In Software Testing” which was engaging, informative and interesting for the audience. The presentation lasted an hour, and was followed by a discussion. Ash engaged the audience with the many aspects of software testing, especially completing the user interface and functionality testing at a faster pace. This is an area where large investment or innovative methods are not available at present. There were many interesting and thought-provoking questions from the audience, indicating that the talk was useful and engaging. With 20 years of international business development, 11 years of that building technology companies, Ash has worked with tech start-ups through to acquisition, and generated sales revenue as high as \$150 million. As a serial entrepreneur, he is focused on finding and solving market needs that have broad appeal among early adopters which are under-served and untapped, and that Cloud, Internet of Things, and mobile-enabled technologies can address. Ash has extensive experience designing software and leading software development teams. During the early stages of his career he worked as a designer in Europe and ran an award-winning agency in Melbourne. Ash has been able to combine his acumen for business, technology, and design into creating digital products that solve real-world problems and deliver great user experiences. Ash is currently the CEO & founder of Bugwolf.

Social Activities

One of the main goals of the events was to promote networking between the presenters, industry representatives, and participants. Having this mind, the events were designed to have coffee-breaks and refreshments, with enough time for the participants to meet and mingle. It was encouraging to observe some participants engaged in serious discussions with presenters, and other participants asking questions and expanding their networks.

Feedback

The organizing committee received very encouraging feedback about the usefulness of these seminars and an expectation that the activities would continue in coming years.

B.4.4 Griffith University - Gold Coast Campus Student Branch

In office:

Chair: Reza Akbarzadeh

Vice-chair: Matthew Jay

Secretary: Tim Alroy

Treasurer: Elise Jenking

Counsellor: Jahangir Hossain

Hello everyone! My name is Reza and I am the new chair of Griffith University - Gold Coast Campus Student Branch. I am currently in my 3rd year studying for a Bachelor of Electrical and Electronic Engineering. It is my pleasure to announce that the branch started its activity in September 2015.

The branch's goal is to expand the IEEE community within Griffith University and across Queensland; in addition, to provide opportunities in which members of IEEE can collaborate and increase their knowledge in their fields of interest.

Three events were held in September and October, and we received an enormous amount of support from both academics and students.

The first branch meeting was held on September 15th and we had over 50 attendees. The meeting's purpose was to expand the IEEE community within Griffith University and recruit new members. The committee also used the meeting to present attendees with our exciting plans for 2016 and beyond.

The topic of our first technical workshop was "Introduction to LATEX". The workshop was presented flawlessly by Dr Stephen So. The workshop addressed the advantages and disadvantages of using LATEX and the online LATEX environment ShareLATEX. Tips and tricks were discussed and helpful resources were provided to students so they could quickly and easily try LATEX themselves.

Some applications of LATEX, such as writing IEEE papers and theses, were discussed. Those in attendance responded positively to the workshop and requests for similar workshops in the near future were received.

As stated previously, the branch's vision is to increase productivity within the IEEE community. In the area of power engineering, the approach is to demonstrate the possibilities and opportunities that exist within the sector, with help from our industry partners. In pursuit of the vision, an industry information session was held and close to 40 members and non-members attended. The guest speaker was Tom Bakker from Energex.

Tom Bakker is a power system engineer who has been in the power industry for over 8 years. He shared his experiences about projects he worked on after graduation, as well as sharing some technical drawings and designs for power systems.

Following the information session, students had the opportunity to visit the Gold Coast University newly-built substation. Students inspected the equipment inside the substation, to gain a better understanding of power systems and their components.

Our committed and enthusiastic team is working hard to increase its productivity in the upcoming academic year by providing similar activities for members.

B.5 Affinity Group Activities

B.5.1 WOMEN IN ENGINEERING (WIE)

In office:

Chair: Alexandra Posoldova

Vice-chair: Bafrin Zarei

Secretary: Marie-Luise Wille

Introduction

The 2015 committee of the Women in Engineering Affinity Group has brought fresh ideas to inspire, engage, encourage, and empower women in science and technology in South-East Queensland. Our mission is to organise events that encourage networking on a local level. In 2015 WIE Queensland organised four events: two seminars, a workshop, and a competition.

Activities

The Women in Engineering chapter started the year with an event attracting role models for ladies in the early stage of their careers called “Women in Research, Find out how these ladies did it and you can do it too!”.

Four guest speakers from different engineering areas, academia and industry spoke about their professional paths, shared their experiences, and gave tips on how to juggle work and family at the same time. The event was well-attended and lots of positive feedback was received. Therefore we plan to organize a similar event in 2016.

An information session about IEEE and WiE was held at QUT for first-year physics and engineering students. The aim of the event was to encourage students to participate in IEEE and WiE activities and to become members.

The next two events were focused on improving presentation skills with professional public-speaking coach Jane Mott. The first event was a workshop called “Perfect Pitch”. The aim of the workshop was to learn how to express one’s self clearly and effectively in a few minutes, leave a good first impression, and connect with the audience.

This event was followed by the “The Perfect Pitch 3-Minute Competition” where skills gained at the workshop were put into practice. Contestants prepared a 3-minute presentation on a topic of their choice. The committee judged the presentation skills, not the content, and each presenter received immediate short feedback from public-speaking coach Jane Mott. The prize, a t-shirt with the WiE logo, an IEEE USB hub, and a \$25 voucher was awarded to the best presenter.

A WiE Facebook page was created to advertise all our events and to provide a platform where members and followers can communicate and network.

Conclusion

2015 was an exciting and new experience for all committee members. The 2016 committee was elected and we cannot wait to organise more events to engage with our members, and attract new members and role models for girls considering technical fields as career choices.

B.5.2 YOUNG PROFESSIONALS AFFINITY GROUP

In office:

Chair: Mohammad Amanzadeh

Vice-chair: Reuben Peterkin

Secretary: Rob Makaremi

Introduction

The IEEE Queensland Young Professionals Program affinity group continued its activities in 2015 with two main aims: recruiting new IEEE members (both students and professionals), and assisting young members to develop their professional skills and transition into professional engineers.

Major Activities for 2015

The Young Professionals Program affinity group has been very active and hosted 3 events in 2015. Our first seminar was held on July 13th, 2015 and was titled “IEEE Career Resources Workshop”. Our speaker Mo Amanzadeh (YPP chair) talked about the benefits of IEEE membership and IEEE online services, including ResumeLab, vTools, and IEEE Job Site. The seminar was held at The University of Queensland. 11 people registered on vTools. Following that, on August 25th, YPP hosted “IEEE Winter Networking event and Mixer” at the QUT Botanic Bar.

Our guest lecturer Donald Cook from the Hypersonic Branch of Defence Science and Technology Group talked about his past projects and shared his experience and journey of becoming an engineer with the audience. It was followed by Q&A, with attendees networking and socialising later in the evening. Approximately 25 people attended this event, amongst whom were undergraduate and postgraduate students, as well as professional engineers.

Most recently, on November 5th, YPP organised a seminar on the importance of using LinkedIn, held at The University of Queensland. The guest speakers were Nkosana Mafico (entrepreneur and motivational speaker), Mo Amanzadeh (YPP chair and team leader at CRC Mining), and Ali Saadat (Schneider Electric), who talked about the role of LinkedIn in professional networking and career development. The event finished with Ali Saadat, also a professional photographer, taking photos of the attendees for their LinkedIn accounts.

B.6 Awards & Recognition Activities

B.6.1 AWARDS & RECOGNITION REPORT

In office: Preethi Preethichandra

This year the Awards and Recognition committee has retained the award structure used in previous years. There has been a change in the process however. In previous years the award nominations began immediately prior to the section’s Annual General Meeting, usually held in late November or early December, causing confusion about which time-period was being evaluated. From 2015 onwards the awards process commences early in the year immediately following the year being evaluated.

There are three award categories for section volunteers and two award categories for student members. While student awards are not administered by the Awards and Recognition committee they are mentioned here for completeness.

The first volunteer award category is Recognition of Service awards. These are an official recognition of a person’s contribution in a particular role and are awarded at the first AGM following the completion of a person’s term in a role. These awards do not require a nomination.

The second volunteer award category is Outstanding Contribution awards, given to people who have been identified as having made a significant contribution during their term in a role. They are awarded

at the first AGM following the completion of a person's term in a role. These awards require a seconded nomination from members of the IEEE Queensland Section, along with a reason for the nomination, to be submitted to the section committee.

The third volunteer award category is the Volunteer of the Year award. This is awarded to the person who is regarded as having made the most substantial contribution during their time in office. Only people who have completed their term of office are eligible. A single plaque is awarded each year. Nominations from members of the IEEE Queensland Section are submitted to the section committee for final selection of Volunteer of the Year.

Awards

Recognition of Service

A total of 15 Recognition of Service awards were awarded within the IEEE Queensland Section for 2014.

Recipient	Role
Tapan Saha	Section Chair
Rahul Sharma	Section Secretary
Richard Yan	Section Treasurer
Mike Robinson	Awards and Recognition Chair
Jack Gaynor	Student Activities Chair
John Billingsley	Control Systems/Robotics & Automation Societies Chapter Vice-Chair
Frederic Maire	Control Systems/Robotics & Automation Societies Chapter Secretary
Konstanty Bialkowski	Microwave Theory & Techniques/Antennas & Propagation Societies Chapter Secretary
Greg Hislopi	Microwave Theory & Techniques/Antennas & Propagation Societies Chapter Chair
Morteza Shahpari	Microwave Theory & Techniques/Antennas & Propagation Societies Chapter Vice Chair
Yateendra Mishra	Power and Energy Society Chapter Vice-chair
Garry Einicke	Signal Processing/Communications Societies Chapter Chair

Outstanding Contribution

Five Outstanding Contribution awards were awarded within the Queensland section for 2014.

Recipient	Role
Konstanty Bialkowski	Microwave Theory & Techniques/Antennas & Propagation Societies Chapter Chair
Alexandra Price	Young Professionals Program Affinity Group Chair
Mike Robinson	Awards and Recognition Chair
Tapan Saha	Section Chair
Richard Yan	Section Treasurer

Volunteer of the Year

A vote was taken by members of the IEEE Queensland Section committee and Tapan Saha was elected Volunteer of the Year for 2014.

Thesis prize awards

There were three categories of award for undergraduate theses in 2015.

- The IEEE Queensland Section Student Prize for the Best Final Year Thesis in all fields of Electrical Engineering and Information Technology was awarded to Matthew Jay from Griffith University for his thesis entitled '*Leak Test and Automatic Purge Station*'.
- The ICPADM-Mat Darveniza IEEE Student Prize for the Best Final Year Thesis in Power Engineering was awarded to Hanxiao Zhang from The University of Queensland for her thesis entitled '*Transmission Pricing in National Electricity Market*'.

- The IEEE Queensland Section Student Prize for the Best Final Year Thesis in Signal & Image Processing was awarded to Connor Mooney-Collett from The University of Queensland for his thesis entitled '*Scan Scheduling for Electronic Warfare*'.

PES Travel Prize awards

The IEEE Queensland Power and Energy Society Chapter Student Conference Travel Prize was awarded to two recipients in 2015.

- Nahid Masood from The University of Queensland for presenting the paper entitled '*Frequency Response and its Enhancement using Synchronous Condensers in Presence of High Wind Penetration*' during the IEEE PES 2015 General Meeting, in Denver, USA.
- Sohel Uddin from The University of Queensland for presenting the paper entitled '*Capacity Constrained Energy Management for Unbalanced Distribution Systems*' during the IEEE PES 2015 General Meeting, in Denver USA.

B.7 Communication Activities

B.7.1 REPORT FROM NEWSLETTER EDITOR

In office: Hugo Espinosa

There have been three newsletters produced so far in 2015, with a fourth due out immediately following the Annual General Meeting on December 2nd.

I had the opportunity to act as Newsletter Editor this year and I would like to thank Mike Robinson, former editor of the newsletter, for his assistance in getting me up to speed in my role as editor.

The three issues and upcoming fourth were produced in LATEX. There was an extraordinary job done by Rob Ellen and Mike Robinson in creating templates, so with straight-forward adjustments I could easily create the previous issues.

Newsletters from prior years are stored in the section's website archives and are accessible to all members.

Shortly I will be handing over to the incoming newsletter editor for 2016. Before I do so I would like to thank all of you who contributed to this year's issues. It has been a pleasure to produce the section's newsletter. Before I finish, I would like to keep encouraging chapters, affinity groups and members in general to submit your contributions. It is the best way to show to the IEEE community how active the Queensland section is. There is a set of guidelines written by Mike Robinson that will help you in preparing your contribution.

I still will be closely working with the incoming newsletter editor, so if you have any comments on the content of the newsletter or suggestions for improvements, please feel free to e-mail me at: h.espinosa@griffith.edu.au. Your opinion will be highly appreciated.

B.7.2 REPORT FROM THE WEBMASTER

In office: Mike Robinson

2015 has been another busy year for the webmaster, though not all of the action is evident on the section's website. Steady progress has been made throughout the year, as will be seen shortly.

Early in the year I created a new web identity for the section by moving away from the old WikiDocs website that has housed the section's web presence for several

years. A new, shorter web address was included in the transition. A considerable amount of effort went into developing a more modern website 'look and feel'. The new website was unveiled at The University of Queensland during the 30th anniversary celebrations in February. Although there was a new look, there were also problems. Firstly, the new web page was merely a portal or entry point to the old website, and secondly it wasn't designed with mobile devices in mind. The phrase 'mobile friendly' may or may not mean much to you, but it has turned web design on its head.

The advent of the Apple iPhone in 2007 created an awareness that web pages designed for laptops and computers don't work when viewed on mobile devices.

When the number of mobile devices outstripped the number of laptops and personal computers in 2012, 'mobile first' replaced 'mobile friendly', meaning that web designers should focus on smartphones and tablets first, then expand the design to fit wider viewports. This came as a shock to me, because designing a web page for a smartphone is not a trivial exercise. Apart from the obvious fact that a smartphone has a smaller viewing area, called a viewport, there are dozens of designs, each with a slightly different viewport. Throw in a few dozen tablet devices and the design problem becomes more unmanageable.

Responsive web design, the new catch-phrase for web design without borders, has taken over from 'mobile first', but it hasn't eased the associated difficulties; nor has shortening the phrase to RWD.

In the middle of the year I undertook the design of a website for another IEEE entity. This provided an opportunity to study the problem without making a commitment to any particular solution. I spent three months reading web design books and experimenting with different techniques.

Frameworks have been developed to assist with RWD.

The general trouble with frameworks is that they add bulk to a website, and bulk should be avoided because it affects the complexity of the design, as well as adding to the time a web page takes to download across the Internet. Studies have shown that consumers will avoid websites that don't download quickly to smartphones.

While working on the other IEEE website I developed my own RWD framework. It is extremely lightweight and produces very skinny RWD web pages. I haven't tested it on all the mobile devices that exist, but it works on all browsers and on all devices that use JavaScript. I have applied the framework, which I've called jRWD, to the section's main web page without problems, and I've developed some new web pages for the AGM awards and the 2016 committee. Over the next 12 months I plan to convert the 100+ web pages on the old website to RWD format.

PARTS C & D

C.1 Relationship with National Societies

IEEE Queensland Section has been doing very well with its sister organizations including Engineers Australia and IET. The Section Chair Prof Tapan Saha attended most of Engineers Australia's Queensland Electrical Branch meetings as the immediate Past Chair of Electrical Branch and IEEE liaison.

C.2 Special Events

IEEE Queensland Section Members participated in 2015 annual Fraternity Dinner organised by Engineers Australia's Queensland Electrical Branch. IEEE PES Chapter organised a number of seminars and workshops at the Engineers Australia premises in Brisbane city. This brings IEEE activities to non-members of IEEE, who are members of Engineers Australia.

C.3 Problems to be anticipated

NONE

C.4 Best Practices of your section (which you would like to share with other sections for the benefits of members)

IEEE Queensland Section works very closely with the local professional body (Engineers Australia) and as well with local industries. Specific example is PES chapter's engagement with the local power industry. A number of PES events were organized at two Queensland electricity distribution company premises. Catering was done by those organizations and there were high level of technical engagements from the electricity industry in the IEEE PES Chapter activity. MTT/AP has also performed outstandingly in providing their service to the members through local industry engagement. Dedications from the volunteers of these two chapters are noteworthy. Inaugural of the senior membership elevation event was very successful. 50% increase in the number of senior members was achieved. A few members after the event expressed their interest in getting involved in section activities.

PART D - GOALS AND PLANS

D.1 Continuation of Project/Activity in Progress and Their Implementation Plans

A number of chapters have exceeded our highest level of expectations by their activities. A number of chapters did not perform well as per our expectation. Section will work closely with the new committees of those chapters and make sure they perform well. We will also maintain our collaboration with the local professional bodies and industry to promote IEEE.

D.2 Goals and Future Plans

At this stage we will start 2015 activities with 2014 goals and plans as below. Then we will update the goals with our new committee and set timeline for each target.

- Organize six events by each chapter and affinity group
- More engagement with the local professional body
- Active engagement with local industry
- Establish student chapters and maintain active engagement with the student communities in six university campuses in Queensland Section
- At least one DL program by each chapter
- Organise at least one Senior Membership Elevation event
- Active in conference/workshops and short course for continuing professional development and build fund for the Section/chapter
- Engage actively with the Australia Council
- Promote IEEE Membership among industry colleagues, who are non-IEEE members

Dr.Garry Einicke IEEE Queensland Section, Chair Email: Garry.Einicke@csiro.au	Dr. Daniel Eghbal IEEE Queensland Section, Vice-Chair Email : m.eghbal@uq.edu.au
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