

IEEE New Zealand Central Section Industry Engagement Activities

A.1 Executive Summary

The New Zealand Central Section (NZCS) has had another good year in 2019, with many events being delivered for members across many areas of interest. Many of these events involved Distinguished Lecturers from around the world. It is these activities which members find most interesting and enable us all to keep at the forefront of research within our fields of interest. In 2019 we again held our two most prestigious events, being the Postgraduate Symposium and the Combined Institutions Industry Breakfast. These events are primarily focused on our student members and on our industry collaboration. These events were again well received by members.

A.2 Major Events

A.2.1 Workshops:

Hyperspectral and thermal remote sensing - From Data to Applications:

Remote sensing is a powerful and versatile technology to assess the surface of the land and natural resources. Imaging technologies and sensor design have developed extensively over the last few decades and now they are becoming more widely available for research and industrial applications. This free workshop brought New Zealand and International remote sensing experts together to demonstrate Earth and Soil Science applications for the science community, and for the industry. This event was held on 1st October, 2019 at Massey University, New Zealand and involved some 18 speakers on the above topic.

Colour and Visual Appearance in Computer Graphics and 3D Printing:

This event involved a number of presentations on related topics as mentioned below. This event is co-sponsored by the IEEE New Zealand Central Section and Massey University. This event was held on 21st November 2019, at Wellington, New Zealand.

- Fabricating Beauty: The Art and Science of Graphical 3D Printing
Speaker: Prof Philipp Urban, Head of Competence Center, Fraunhofer Institute for Computer Graphics Research (Germany)
- Voxel Printing Hyper-Realistic Eyeballs
Speaker: Tor Robinson, Digital Manufacturing R & D Specialist, Weta Workshop
- Cinematic Mixed Reality Rendering
Speaker: Dr Andrew Chalmers, Researcher, Victoria University of Wellington

Wireless Systems Workshop:

This workshop brought together industry professionals, engineers, researchers, academics, students, start-ups and policy makers to discuss technologies and issues of interest to the wireless community in New Zealand. At the end of the workshop, hands-on experience was achieved with National Instruments' integrated hardware and software platform for rapid prototyping of real-time wireless systems using the NI LabVIEW Communications System Design Suite (LabVIEW Communications) and the NI USRP-RIO FPGA-based software defined radio. The event covered the most important aspects of the idea-to-prototype flow in a single tool, including floating-point simulation, floating-point to fixed-point conversion, HW/SW partitioning, performance-complexity trade-offs, and finally verification and testing on an FPGA-based software-defined radio. This event was held on 6th - 7th September, 2018 at Auckland, New Zealand.

Image Processing in VHDL on FPGAs:

This workshop was aimed at engineers and scientists who need to understand basic concepts of FPGAs, and how they may be applied to image processing. It was targeted particularly for those who were entering this field, or were looking at using FPGAs for an image processing application. This event involved a number of lecturers and hands on laboratories, the basic tools for FPGA based development for implementing a range of fundamental image processing operations. The workshop was conducted by Professor Donald Bailey who has over 35 years of experience in image processing and machine vision. This event was held on 4th -6th April, 2018 at Palmerston North, New Zealand.

A.2.2 Special Events

The Combined Institutions Breakfast Symposium:

An annual industry breakfast seminar event which is held jointly with the local IET network and the Wellington Branch of Engineering New Zealand (ENZ). This event is especially targeted at industry members from all three Institutions. It also provides an excellent platform for collaboration with our sister professional institutions operation in our region. This event included joint sponsorship of IEEE, IET and ENZ. This event has been very successful joint institutions meeting with industry.

The IEEE/IET/ENZ Combined Institutions Seminar:

- i. The guest speaker for this event was Andrew Carroll, General Manager, Network and Field Management at Chorus, who addressed the challenges that Chorus experienced in implementing one of the largest telecommunication projects ever undertaken in New Zealand, being the deployment of fibre optic cable to 87% of New Zealand premises and the connection of these premises to the fibre. Approximately 25 members and guests of the IEEE Central Section, IET Wellington Network and ENZ Wellington Branch were welcomed to the special event, hosted by all three institutions on 11th September 2019 in Central Wellington, New Zealand.



Dr. Murray Miller introducing the speaker



Dr. Andrew Carroll, the speaker at the breakfast event

- ii. The guest speaker for this event was is Tony Ryall, Chair of Transpower, presented the topic on "How Transpower is thinking about the future of the electricity industry in New Zealand". This event was held on the 19th September 2018 in Wellington, New Zealand. About 35 people participated in the event, with a good spread of members across the three Institutions: Institution of Electrical and Electronic Engineering, Institute of Engineering and Technology and Engineering New Zealand. He highlighted his talk with some key trends and the initiatives being taken to address these trends. His talk inspired many questions from the audience, which generated a great discussion, and was supplemented with information from some of the Transpower engineers within the audience. Feedback from the event has been very positive, with several members of the audience commenting on the quality of the speaker and the ensuing discussion.

The IEEE/IET Joint Institutions Seminar:

- i. The guest speaker for this event was Dr. Stuart Johnson, General Manager, Network Transformation at Energy Networks Australia, where he has been responsible for policy and advocacy on issues of critical importance to managing transformational change for the industry, including projects such as the Electricity Network Transformation Roadmap (2017) and Open Energy Networks. He is also currently the chair of the ESI Transmission, Distribution and Rail Traction Industry Skills Committee. He presented the 'Australian Open Network Program' that is future proofing household PV installations and battery systems. It was held on 2nd July 2019, at the Beca Offices in Wellington, New Zealand and was attended by about 25 people.
- ii. The guest speaker for this event was Dr. Graham Ault, Founding Director, at Smarter Grid Solutions, UK, where he presented the international Distributive Generation DG developments and assessed several smart grid approaches to integrating DG. Specifically, Active Network Management (ANM) was explored in greater detail with starting from system and market context and moving through concepts and methods, technologies, applications and implementations. It was held on 20 June 2017 in Wellington, New Zealand.

The Joint Institutions Lecture:

- i. This lecture was organized by the PES NZ Central Chapter, Transpower, and Victoria University of Wellington jointly with IET and EEA on 26th June 2019 in Wellington, New Zealand. The Distinguished speaker was from IEEE Power and Energy Society visiting New Zealand to deliver the Keynote during EEA 2019 conference. The distinguished lecturer for this event was Dr. Damir Novosel, president and founder, at Quanta Technology, a Fortune 500 company, presented the topic “Factors for Sustainable Electrical Energy Delivery”.
- ii. This lecture was organized by the PES NZ Central Chapter, Transpower, and Victoria University of Wellington on 7th December 2017 in Wellington, New Zealand. The Distinguished speaker was from IEEE Power and Energy Society distinguish lecturer. The distinguished lecturer for this event was Dr. Kalyan K. Sen, Chief Technology Officer, at Sen Engineering Solutions, presented the topic “Practical power flow controller brings benefits of power electronics to the grid”.

A.2.3 Conferences:

Multicore World Conference:

The 8th Multicore World is held annually in Wellington and provides the knowledge and strategies to future-proof your technological innovation.

Speakers were from industry such as Intel, Arm, Facebook, Oracle, Broadcom as well as from the major US National Labs (Oak Ridge, Los Alamos, Argonne, PNNL) and from Japan, Singapore, Netherlands, UK. IEEE NZCS members were offered a 10% discount to attend this conference and at no cost to the section.

Ad Hoc Networks Conference:

The 11th edition of the event, ADHOCNETS 2019, was held in Queenstown, New Zealand, on November 18th-21nd, 2019. The annual International Conference on Ad Hoc Networks (AdHocNets) focuses on ad hoc networking technologies and their applications. In recent years, ad hoc networks have been attracting an increased attention from the research and engineering communities. The aim of the annual AdHocNets conference is to provide a forum that brings together researchers and engineers from academia, government laboratories as well as industry to meet, network, exchange ideas and present their recent research work, and discuss future directions on all aspects of ad hoc networks. The conference included keynote speeches, invited talks, and technical sessions.

Telecommunication Networks and Applications Conference:

The International Telecommunication Networks and Applications Conference (ITNAC) event is held every year either in Australia or New Zealand (www.itnac.org.au) and this year it was hosted in Auckland, New Zealand on November 27th-29th. ITNAC 2019 seeks to address and capture highly innovative and state-of-the-art research from academia, the communications industry and standardization bodies that covers distributed, mobile, cognitive and cloud computing, modelling and simulation, computer and data communications, local and metropolitan networks, optical, wired and wireless telecommunication networks and applications.

A.3 Relationship with National and International Societies and Non-Government Organizations (NGO)

- Nature of relationship and details of any formal agreement signed
 - Engineering New Zealand (ENZ)
 - Collaboration Agreement signed some years back – needs to be renewed
 - Joint events held annually
 - Considerable overlap in membership
 - Institute of Engineering and Technology IET)
 - Collaboration Agreement signed some years back – needs to be renewed
 - IEEE NZCS Chair is also an IET Wellington Network Committee member
 - Considerable overlap in membership
 - Several joint events held annually
- Details of joint activities
 - Primary joint event with ENZ and IET held annually is the Combined Institutions Breakfast event.
 - Other events held on a collaborative basis as appropriate.
- Benefit to IEEE members (for example discounts, access to technical information etc.)
 - IEEE members get to access technical seminars and other events which would not be otherwise possible without multiple membership fees

- Benefit to Section (for example help in membership development, venue facilities, cost saving etc.)
 - Greatly increased range of activities for members with less organizational effort
 - Leverage the scale and scope of three organizations for the benefit of members
 - Reduces competition for members between these three organizations

A.4 Plan for Sustainable Industry Engagement.

- The industry engagement plan will continue the work from previous years as follows:
 - Continued support of Chapter seminars and related activities with particular emphasis on Distinguished Lectures,
 - The holding of the annual Combined Institutions Industry Breakfast event,
 - The holding of the Postgraduate Presentation Symposium by the Combined Student Branches,
- The industry engagement plan will also include following events:
 - The holding of quarter or half yearly seminars events with distinguished women engineers from industry to improve involvement of women in industry in section activities.
 - As part of Industry relations activity, we shall include webinars by prominent industry speakers (national or international).

A.5 Innovative ideas to make IEEE more creative and value added for sustaining the membership retention and recruitment goals

- New Zealand like many countries has a national engineering institution which in our case is called Engineering New Zealand.
- As Engineering becomes increasingly recognized as a critical discipline for the delivery of safe modern facilities, the requirements placed on engineers to ensure Continuous Professional Development and up to date competency in one's fields of practice increases to the extent that it becomes a matter of Regulatory Compliance,
- The Regulatory Compliance aspect is typically associated with membership and competency evaluation through the national engineering institution, which requires membership of Engineering New Zealand.
- The threat for IEEE is that increasingly engineers must join their national engineering institution to ensure Regulatory Compliance to practice engineering nationally which then puts pressure on funding to also join other institutions such as IEEE.
- This is becoming an increasing competitive threat to institutions such as IEEE and IET in New Zealand.
- It is highly likely that some form of joint membership will be essential in the future, which enables membership of ENZ and IEEE (say) at a reduced rate relative to joining each institution separately.
- As indicated above, it is becoming increasingly essential to find improved ways to work collaboratively with our national engineering institution, Engineering New Zealand, so that members are not unduly burdened with membership fees for both organizations.
- If we don't find a way to do this, the Regulatory Compliance requirements will ensure that ENZ gets membership priority over IEEE.
- To reduce the burden on individual membership especially of industry, we shall explore the options of joining the company as a member rather than its employers.

Signed Approval:

A handwritten signature in black ink, appearing to read 'Sridhar Pulikanti', with a long horizontal stroke extending to the right.

Dr. Sridhar Pulikanti
IEEE New Zealand Central Industry Coordinator
Date: 28 April 2020

A handwritten signature in purple ink, appearing to read 'Murray Milner', with a long horizontal stroke extending to the right.

Dr. Murray Milner
IEEE New Zealand Central Section Chair
Date: 28 April 2020