Editorial:

This is the nineteenth newsletter I've edited. This one is being edited with the very latest stable version of Libre Office – 7.04.2.

This continues to report our activities during the corona virus epidemic. There weren't many of them, since we exist to bring people together and this isn't a good idea in the middle of an epidemic.

Vaccinations should be under way by the time this issue gets on the web-site, but only the more elderly members will have been vaccinated by the time the July issue gets out, and we won't have been able to generate a lot of activity to report before the October issue either.

I've now got my first vaccination, but I'm old enough to be in the 1B group.

Colin wants to make Circuit more technically orientated - research, new technique, new facility, etc., but finding the content to make a real difference would seem to need a great deal more effort.

This means we need the help of our members to contribute and when we find that kind of content there are probably other outlets that could take it to a wider audience.

For a start, let's see what articles arrive for the June issue. Is there anything special at your workplace that others should know about?
**Chairman's Message**

We congratulate the five members who have obtained the grade of Fellow and welcome the new members to the Section.

With the Covid-19 vaccine starting to rollout, things are hopefully returning to pre-coronavirus conditions, where face to face meetings can happen. We must still be careful in what we do. Sudden lock downs have occurred at short notice.

A number of the JILS presentations have had a face to face component. These not been well attended, with only a couple of people present. I understand the presenters like a live audience, as this gives them feedback, but people are cautious about gathering together.

We see the benefit that Covid-19 has brought, in that now members who were previously unable to physically attend events can now log in from remote locations. We need to ensure that - where possible - we retain the virtual component of our events, to include the maximum participation, especially for those in remote areas.

Last year I had planned to have some social activities but Covid-19 put a stop to that, as it did to so much else.

This year we have started with a luncheon on the Central Coast at Woy Woy, primarily for Life Members, but the invitation was open to all Members. I am planning on holding one of these luncheon events every second month, moving the location around. I am currently considering a location on the Parramatta River for the next one in May. If there is some interest, consideration could be given to having some evening social events. If any Members have a favourite dining spot, please let us know and we will look into holding a function there.

Last year, we cancelled UNITE because of the coronavirus. This year there will be an UNITE, hopefully with a physical component, most likely in the Sydney area. But we do plan to have a virtual component as well, so that those unable to attend in person can benefit, and understand more about the activities of the Section, and how they can participate and take advantage of them.

If you have any topics or areas of interest that you believe the Section should consider, please let us know. We will try to make everyone aware of them at UNITE and explain how we will try to include them in our events.

Some members take up the challenge by planning activities. A case in point is Stefan Mozar who has planned a set of 10 lectures by international professionals for the Joint Broadcast Technology, Consumer Technology and Product Safety Engineering Chapter.

Part of the function of the Section is to make members aware of the engineering and related activities that are happening in Australia. Many of you are aware of activities occurring in your fields that most of us would not know about. Please pass this information on, so that the Section or the appropriate Chapter can create an event to highlight them.

I had better finish my message or Circuit will never make it out to the members. It has already delayed Circuit's release by a couple of weeks, and Bill isn't happy about it.

Regards, Colin Elston, Chair, NSW Section
New Fellows

We have five new fellows this year

Prof. Alberto Avolio, BE, PhD (UNSW), FIAMBE
Macquarie University -

for contributions to knowledge and monitoring of arterial hemodynamics

Professor Avolio, is Professor of Biomedical Engineering in The Australian School of Advanced Medicine at Macquarie University, Sydney, Australia. He has acquired international recognition in the field of cardiovascular haemodynamics.

Assoc. Prof. Derrick Wing Kwan Ng, University of NSW -

for contributions to resource allocation for wireless communication networks

Assoc. Prof. Kwan, is a Senior Lecturer and the Scientia Fellow at the University of New South Wales, Sydney, Australia. He has served as Editorial assistant to the Editor-in-Chief of the IEEE Transactions of Communications(2012-present), Editor of the IEEE Communications Letters (2012-2017), Editor of the IEEE Transactions on Green Communications and Networking (2016-present), Editor of the IEEE Transactions Wireless Communications(2016-present), Guest editor, IEEE JSAC, "WIRELESS TRANSMISSION OF INFORMATION AND POWER", 2018; Area Editor, IEEE Open Journal of Communications Society(Sep. 2019 - Present) and Editor of the IEEE Open Journal of Vehicular Technology(Sep. 2019 - Present)

Prof. Willy Susilo, University of Wollongong

- for contributions to cloud computing security

Prof Susilo, is Professor and Head, School of Computing and Information Technology and Director of the Institute of Cybersecurity and Cryptology (iC2)
He has served as an associate editor on IEEE Transactions in Information Forensics and Computing, and an associate editor on IEEE Transactions in Dependable and Secure Computing.
Prof. Shujun Zhang, University of Wollongong
- for contributions to the development of advanced piezoelectrics for transducers

Professor Zhang, is a Professor at the Australian Institute for Innovative Materials and Institute for Superconducting and Electronic Materials
Professor Zhang is the associate editor-in-chief of IEEE Transaction on Ultrasonics, Ferroelectric and Frequency Control

Assoc. Prof. Xiuping Jia, University of NSW(Canberra)
- for contributions to feature mining and classification of hyperspectral images

Assoc. Prof. Jia has served as Chair of the Joint ACT/NSW GRSS Chapter for several years. She is a Senior Lecturer at The University of New South Wales, Australian Defence Force Academy, Canberra, Australia.
She is an Associate Editor of IEEE Transaction on Geoscience and Remote Sensing.

The IEEE NSW Section congratulates Profs Avolio, Ng, Susilo, Zhang and Jia for their achievements and thanks them for their contributions to IEEE and Engineering.

Contributed by Tony Zaglas,
IEEE NSW Section Awards and Recognition Chair 2021
EULOGY
Philip Dulhunty OAM LSMIEEE

On 29th November, 2020, the IEEE and the Electricity Supply Industry in Australia lost a highly regarded colleague with the death of Philip Dulhunty OAM.

Philip joined the IEEE in September, 1969.

Philip was widely respected for the great contributions that he made to Australian industry, and some of the features of his lifetime are given in the following links:


In 1956 Philip very bravely employed me to work in his company Dulmison. I had completed 2 years of full-time study towards an electrical engineering degree, and for personal reasons was obliged to change my study regime to part-time.

My first responsibility was to produce the first product catalogue for the overhead transmission line hardware where Dulmison became a major supplier in Australia and overseas. I wonder if any of those catalogues have survived.

This meant that I had the privilege of working with Philip, and had the pleasure of getting to know him very well over the numerous years that followed. I am deeply saddened by his passing.

To read his autobiography is to get just glimpse of a very great man. He was man of the period, who achieved greatness in the electrical engineering industry even though his schooling stopped when he was 14 years old and living in a county town in NSW.

People like Philip don't stop learning when they leave school, and do tend to get better instruction than they were being offered at a secondary school in the country.

Dr Graeme Gwilliam
DC Power Packet Dispatching System for Internet of Energy (IoE)

Summary of a Tutorial Delivered at IEEE Technically Co-sponsored International Conference on Smart Power and Energy Internet Systems (SPIES) 2020

This annual conference serves as a forum in which power and energy experts from academia, industry, and utilities across the globe can exchange ideas and experiences on emerging and enabling technologies.

It is a timely topic given that our electric power systems are undergoing rapid transformation as a result of the strong push for renewables and the advances in many areas, such as semiconductor materials, manufacturing, electronics, computing, information and communications and power electronics technologies.

The second conference was held over the 15th to the 18th of September 2020. The third conference will be held in Shanghai, China in September 2021.

Because of the COVID-19, the organizing committee changed the SPIES 2020 conference to a virtual event. Dr CMFS Reza¹ and I were invited to deliver a tutorial on an emerging topic of this area.

We chose to present a tutorial entitled “DC Power Packet Dispatching System for Internet of Energy”. The tutorial was pre-recorded, but it was live streamed during the session alongside a Q&A session using the chat tool and Q&A tool on Zoom. There were 30 participants in the tutorial session.

The tutorial started by pointing out that the rapid development of Internet of Things (IoT) has enabled the Internet of Energy (IoE), which integrates information and power to optimize both energy efficiency and power conversion efficiency of the distributed energy systems.

¹Dr Reza holds a PhD degree in Electrical and Information Engineering. Currently he is working as a Consulting Engineer – Power System Modelling at GHD (email: susan.reza@ieee.org). GHD was Gutteridge, Haskins and Davey in Melbourne at one point. See https://www.ghd.com.
The most straightforward approach to adopting IoE is to add an information layer to the controllers of different power equipment and coordinate the power flow at the expense of additional cost of communication system. An alternative solution is the power-line communication (PLC) technique which can transfer power and information flow simultaneously through the same transmission line. Traditional PLC technology is not designed to realize time-division and multi-path transmission of power flow.

Next, we conducted a brief review of existing technologies that are applicable for IoE. It includes Power-over-Ethernet (PoE), DC bus signaling (DBS), digital power grid, power flow colouring and power line communication (PLC). Each technology has its own strengths and limitations in terms of suitability for IoE implementation. Take the PoE as an example. It requires no addition cost to implement IoE on PoE as it uses the data conductors to send electric power. However, the maximum power it can handle is less than 100W.

The second part of the tutorial introduced an alternative option for IoE implementation, namely, power packet dispatching system (PPDS). This recently introduced technology provides capabilities similar to PLC technology but it works on a DC power system. The PPDS converts DC voltages into voltage pulses in an information packet format similar to that in communication systems, namely, header bits, payload and footer bits. Each packet is dedicated to a particular electrical load which has its address located in the header bits.

One key advantage of PPDS is that there is an energy mixer which can interface with different hybrid energy and power sources and generate voltage levels matched to that of the targeted load.

An energy router is placed in front of the cluster of loads to help distribute the power packets to the designated loads. The communication integrated power system has a simple structure that reduces multiple voltage conversion stages. Hence for short transmission distance (tens of meters) PPDS overall conversion is comparable with a conventional DC power system.

One key challenge, is the absence of any explicit current limiting. We propose to add an over-current protection scheme to improve the system reliability. The key idea is to use the voltage level and duration of the voltage sag to determine if it is a transient burst or a persistent over-load condition.

The tutorial concluded with some suggestions for future research in the area, such as fault detection and isolation, more efficient power conversion and clustering to facilitate the adoption of PPDS for IoE applications.

Contributed by Professor Dylan Lu (UTS).
Chair of IEEE NSW Joint Chapter
Industrial Electronics, Industry Applications & Power Electronics

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All Life Members were invited to attend a lunch at Woy Woy Fisherman’s Wharf on Wednesday 17 March 2021. The lunch was attended by (from left to right) Ken Barber, myself (Tony Zaglas), Past Chairs Dr Graeme Gwilliam and Prof Ramutis Zakarevicius, Joe Venuti, Section Chair Colin Elston and Mrs Zakarevicius (the photographer).

Some of the Members travelled on the train from Central, whilst others joined at Hornsby and others travelled independently to the venue.

The restaurant required reservations and the usual COVID QR check in and checkout using the Service NSW app.

During the lunch various topics were discussed, including the Joint Lecture Series and the possibility of organising some presentations in the fields of those attending as well as the IEEE NSW/Australia Section 50th Anniversary in 2022. Also discussed was the consolidation of the Section’s History, and sourcing editions of the newsletter CIRCUIT before 2001 (editions of CIRCUIT after 2001 are available for viewing at Newsletters – IEEE NSW).

Many thanks to Section Chair Colin Elston for organising the event and making the necessary Reservation booking.

Tony Zaglas
Life Members Vice Chair

Editors note: I didn't go. I thought about it, but it felt a bit Covid-19 irresponsible. It still does.
IEEE SENSORS 2021 is intended to provide a forum for research scientists, engineers, and practitioners throughout the world to present their latest research findings, ideas, and applications in the area of sensors and sensing technology.

IEEE SENSORS 2021 will include keynote addresses and invited presentations by eminent scientists and engineers.

Topics for IEEE SENSORS 2021 include

- Sensor Phenomenology, Modeling, and Evaluation
- Sensor Materials, Processing, and Fabrication
- Chemical and Gas Sensors
- Microfluidics and Biosensors
- Optical Sensors
- Physical Sensors: Temperature, Mechanical, Magnetic, and others
- Acoustic and Ultrasonic Sensors
- Sensor Packaging
- Sensor Networks and IoT
- Sensor Applications
- Sensor Systems: Signals, Processing, and Interfaces
- Actuators and Sensor Power Systems
- Sensors In Industrial Practice

Focused Sessions

IEEE SENSORS 2021 will have focused sessions on emerging sensor-related topics. Details related to the Call For Focused Sessions are on the conference website.

Publication of Papers

Presented papers will be included in the Proceedings of IEEE SENSORS 2021 and in IEEE Xplore pending author requirements being met. Authors may submit extended versions of their paper to the IEEE Sensors Journal.

Industry Day

A special track designed to encourage industry participation will include industry showcase/demonstrations, industry networking, and an industry panel luncheon. Special flexible one-day registration will be available to facilitate industry participation.

Special Issue in the IEEE Sensors Journal

A small number of best papers presented at the conference will be invited to contribute extended abstracts towards a special issue of the IEEE Sensors Journal. An invitation is not a guarantee of publication but an indication of content desirable to the journal, as well as the recognized quality of the work as submitted to and presented at the conference.

Exhibition Opportunities

The Conference Exhibit area will provide companies and other organizations with an opportunity to display and promote products, services, equipment, books, journals, publications, and/or other items to attendees from around the world.

For further information contact Coral Miller, cmiller@conferencecatalysts.com

Please visit: 2021.ieee-sensorsconference.org
New and upgraded Members of the NSW branch of the IEEE

For the period from the 1st July 2020 to the 30th September 2020.

New Fellows

Five but they have their own page, with photos.

Life Fellows

Just one - Anthony K. Milne

Life Senior Members

We have four new life senior members

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<th>Chris</th>
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<th>Drane</th>
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<td>Singaravel</td>
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Life Members

We have eighteen new life members.

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<th>Ning</th>
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<td>Giuseppe</td>
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<td>Venuti</td>
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Senior Members

We have sixteen new senior members

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<th>Muhammad</th>
<th>Usman</th>
<th>Afzal</th>
<th>Shaghik</th>
<th>Atakaramians</th>
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<td>Rohitash</td>
<td>Chandra</td>
<td>Raymond</td>
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<td>Hossein</td>
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<td>Maqsood</td>
<td>Hashmi</td>
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<td>Nikesh</td>
<td>Anand</td>
<td>Lalchandani</td>
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<td>Wei</td>
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<td>Suranga</td>
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<td>Nicholas</td>
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<td>Ajay</td>
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<td>Faisel</td>
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Members

We have a lot more new members - 72 of them

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<th>Tom</th>
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Associate Members

We have five new associate members.

Kathleen Beirne
Nigel Herring
Guangze Zeng

Affiliate Members

We have two new affiliate members

Joseph M Kam Brian Stasak
Graduate Student Members

We have 103 new or upgraded graduate student members. Abhirup Dikshit and Anna Lidfors Lindqvist won prizes recently (which I paid out as treasurer). Vivek Sharma is an active volunteer so he has got money from me to cover spending on activities.

Maysam Abbasi Abolfazl Abdollahi
Md. Nargis Akhtar Hamid Alinejad-Rokny
Ann Asadujjaman Julia Axelrod
Jeevan Baby Felipe Barboza da Silva
Timothy Basnayaka Noah Biddle
Bianca Boye Brooke Campbell
James Chen David Cotton
Raman Coyte Thilini Dahanayaka
Samir Dhiman Abhirup Dikshit
Nargess Gautam Amin Gharipour
Houman Ghassempour Marjia Haque
Yi He Ridwone Hossain
Zheming Hu Yao Huang
Jamil Ispahany Reenu Jacob
Sadari Samanmalie Jayawardena Shuyue Jia
Xuan Jiao Chris Johnathon
Kerrylo Karpenko Grant Paul Kelly
Grace Kennedy Muhammad Usman Ali Khan
Rinta Kridalukmana Balakrishnasarma Kugeswarasarma
Quy Lam Yafu Li
Yun Li Li
Anna Lidfors Lindqvist Derick Lima
Hangrui Liu Hangyue Liu
Zhe Liu Chang Liu
Baihe Ma Harry Marquis
Khawaja Masood Sourabh Mishra
Yamin Mo Rahma Mukta
Ahmed Musleh Syed Haider Abbas Naqvi
Andrew Nell Tien Dung Nguyen
Harry O'Donnell Gaoyang Pang
Stefania Peracchi Jessie Ann Posar
Ling Qi Javad Rezazadeh
Shuvashis Saha Venkata Soma Sekhar Sahukara
Nazmus Sakib Samta Sapra
Paul Scott-Taylor Arun Sebastian
Mohammad Shalby Yashothara Shanmugarasa
Vivek Sharma Yu Shen
Rukshani Somarathna Tianhang Sun
Suresh Suntharalingam Abbas Tabandeh
Sean Tan Jin Yeong Tan
Amid Tavallaie Diya Thomas
Xiaoyi Tian Aron Turner
Eduardo Villasenor Alvarez James Vohradsky
Heng Wang intentional gap
New Student Membership

We have 41 new student members

James Balding Noor Alhuda Mahmoud Bani Mousa
Sarah Bruggisser Yuqian Chen de Zwart
Benjamin Leigh Pete de Zwart
Yuhao Ge Minh Nhat Ha
Victor Hernandez Moreno Nb L
Jeevika Lalchandani Chinhao Li
Siyuan Li Asad Lilani
Jiannan Liu Jonela Lobo
Santhosh Madangarli Zaidoon Adel Magaref
David John Mansfield Hannabeth Marchant
David Merxhushi Ardalan Mirzaei
Jayden Moore Baodi Ning
Halayudhar Reddy Palle Andrew Luke Parker
Jeremy Thomas Parker Luke Pearson
Uswaththa Liyanage Samalika Lalchamli Perera
Yuden Yanru Sae-Ueng Angus Ritossa
Sara Salim Omer Seker
Yunchuan Shi Isheeta Sinha
Mahendra Subedi Anshul Trivedi
Anton Tutoveanu Anne Marie Vuong
Xinghao Yang Saha

Submitted by Dr. Bruce Poon – e-mail adsphere@optusnet.com.au
IEEE Limited Offer*

If you are a 3rd, 4th or a post-grad student in 2021**

The IEEE NSW Section will sponsor your student membership fee!

Instructions:

1. Go to [www.ieee.org/join](http://www.ieee.org/join) and register as Student Member.

2. Type in all your details. On the check-out process, press ‘Print & Mail/Fax order’ instead of ‘Proceed to checkout’. From the browser menu, print to PDF.

Ensure your postal address and contact details will be valid for the next 12 months or more. Instead of sending the form to IEEE HQ USA, please forward a PDF copy of this application with **Member/Customer number** under “Order Information” (Name of the File: your name-IEEE NSW student membership offer.pdf) and a copy or your current student card (Name of the File: your name.pdf) to:

Arslan Kiyani ----- IEEE NSW Student Activities Chair e-mail: arslan.kiyani@gmail.com
cc Dr Bruce Poon ----- IEEE NSW Membership Development Chair. e-mail: bruce.poon@ieee.org

If you are students of the following universities, please cc a copy of your application to the student branch (SB) chairs:

- Macquarie University SB Chair : Vivek Sharma ([vivek.sharma@students.mq.edu.au](mailto:vivek.sharma@students.mq.edu.au))
- University of New South Wales SB Chair : Logan Peters ([peters_l@hotmail.com](mailto:peters_l@hotmail.com))
- University of Sydney SB Chair : Mir Nahidul Ambia ([mir.ambia@sydney.edu.au](mailto:mir.ambia@sydney.edu.au))
- University of Technology Sydney : Huynh Nguyen Van ([Huynh.NguyenVan@student.uts.edu.au](mailto:Huynh.NguyenVan@student.uts.edu.au))
- University of Western Sydney SB Chair : Ms Manisha Arde ([19643120@student.westernsydney.edu.au](mailto:19643120@student.westernsydney.edu.au))
- University of Wollongong SB Chair : Yani Theoharis ([pit289@uowmail.edu.au](mailto:pit289@uowmail.edu.au))

* The number of free student memberships is **limited** and will be awarded on a first come first serve basis. This offer excludes membership to individual IEEE societies which may be purchased separately. This offer is available only to students located in New South Wales. The free student membership offer covers the first year of membership only. Offer not available to current IEEE student members.

Deadline for submission is 4:00pm on the **30th of April 2021 or when quota is filled** (whichever comes first) and all applications will be processed from the beginning of April 2021.

** Please attach a copy or your current student card.
Circuit is currently provided electronically from the IEEE NSW Section web site

https://site.ieee.org/nsw/newsletters/

Members will be notified by email when a new issue is posted on the Website. Future copies of Circuit will only be sent by paper mail on request.

If you require Circuit to be mailed to you in 2021 please complete the form below:
Don't bother if you were already getting it by mail in 2020.
Please Detach

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Yes, I want to continue receiving future editions of Circuit by post

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Email: ..............................................................................................................

Post to: Bill Sloman, Circuit Editor, Unit 60, 1 Tewkesbury Avenue, Darlinghurst NSW 2010

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