



The Institute of Electrical and Electronics Engineers, Inc.

VOLUME 48 Issue 3

Secretariat

AUSTRALIAN PROFESSIONAL CENTRE
PO Box 576
CROWS NEST NSW 1585
Tel: +61 2 94318600

October 2021

IEEE NEW SOUTH WALES SECTION
ARBN 078 576 495 ABN 34 078 576 495

Editor: Bill Sloman
e-mail: bill.sloman@ieee.org
Web page:
<http://sites.ieee.org/nsw/>

Contents:

- Pages 2 -3 Chair's message
- Page 4 Karu wins 2021 Region 10 outstanding volunteer award.
- Page 5 History Committee 2021
- Pages 6 - 7 Golden Anniversary 2022
- Page 8 Anniversary Celebration Book
- Pages 9 - 10 Nine-Level switched capacitor inverter.
- Pages 11-12 Graeme Gwilliam is now an IEEE STEM Ambassador
- Page 13 Flyer for Sensors 2021, now sadly virtual
- Pages 14 - 18 New and upgraded members
- Page 19 If you want this on paper by post, and aren't already getting it that way.

Editorial:

This is the twenty-first newsletter I've edited. This one is being edited with the very latest stable version of Libre Office – still 7.06.2. I've checked for up-dates and there wasn't one.

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.

Vaccination is progressing rapidly but there's still a way to go before we will be able to generate a lot of activity to report.

Graeme Gwilliam is now an IEEE STEM Ambassador - one of forty around the world. The name is new, the role is the one he has been playing (with some distinction) for years They've finally worked what to call it.

The Dylan Lu et al paper is exactly the kind of technical input we want. Of course it depresses me, since I like inductive inverters. If you put two transformers into one inverter, you can get the ripple current way down, but nobody has yet worked out how to make it cheap.

https://www.researchgate.net/publication/3531034_A_resonant_DC-DC_transformer

The idea - the Cuk inverter - goes back to 1983, and clearly needs even more work.

<https://ieeexplore.ieee.org/document/1062238>

Chairman's Message,

At the time of writing this message, those of us, who are in the Greater Sydney area, will have been in lock-down for twelve weeks, with a prospect of coming out during October, when 70% of the population over the age of 16 will have been fully vaccinated. The actual conditions post lock-down are still being formulated. It is hoped that this includes an opportunity for some face to face activities to occur.

What has been happening?

We had grand plans for Unite 2021 with both virtual and physical components until lockdown was announced which meant its cancellation for this year. After cancelling it for the second year, it is our intentions that Unite 2022 will be staged subject to health regulations and all members will have an opportunity to participate either physically or virtually.

Some of our Chapters and Groups have been quite active in hosting events but overall our events have been less than I had hoped for. It is understood that a number of us are suffering from not being able to mix with others which results in the prevailing lack of enthusiasm. The end result is little desire for things to happen resulting in events not being planned. It is hoped that when lockdown is lifted the number of events will increase.

While on the subject of events, the AGM still remains a concern. Early in the year, we were looking forward to having the usual get together and dinner for the AGM. In light of the lockdown and uncertainty of its lifting and the subsequent regulations, it has been decided that the AGM again this year will be totally virtual. The AGM will be held on Wednesday 24 November. An invitation will be sent to all Members.

The Australia Council had its 35th Anniversary on Tuesday 5th October which was a Webex event.

The IEEE will have been established in Australia for 50 years in 2022. The first IEEE section in Australia was established in Sydney - as the Australian section - and when other Australian Sections were created subsequently, it was re-designated as the NSW Section. The NSW Section is currently planning how to celebrate this occasion. There are articles in this issue of CIRCUIT about the history and proposed 'event/s'. Please read the articles on pages 5, 6-7 and 8.

There is interest in forming new Chapter for Magnetics and a NanoTechnology.

The Section congratulates Karu Esselle on receiving the award of R10 Outstanding Volunteer Award. (see article). Graeme Gwilliam's work with STEM Education has also been recognised by the Education Activities Board.

We have not had many opportunities to get together this year. We are always looking for new people on the Section committee to inject new ideas and organise events. If you have a particular interest area then getting involved in a Chapter or Group may be more your scene. The Section, Chapters, Groups and Student Branches welcome Members to volunteer to assist. There are a number of positions waiting to be filled and others where the incumbent has served their maximum term which also need to be filled. Please consider whether you can assist and volunteer?

For 2022, our main tasks will be;

Conducting a worthy celebration of the IEEE being in Australia for 50 years.

Committing ourselves to supporting STEM education at all levels in the state education system.

A successful UNITE '22.

Looking further ahead, a group is bidding to bring the Globecom Conference to Sydney in 2025. The Section has agreed to support them. The outcome of the bid expected to be known in December. If they are successful, the Section will be looking for all interested Members to give their support and assistance to the preparation and conduct of this most prestigious conference. Sydney was the host city in 1998, and it was a great boost to the NSW Section.

Colin Elston, Chair – IEEE NSW Section

Prof Karu Esselle wins IEEE Region 10 Outstanding Volunteer Award for 2021



On behalf of the IEEE NSW Section I would like to congratulate Past IEEE NSW Section Chair Prof. Karu Esselle, FIEEE, FRSN, FIEAust on winning the IEEE Region 10 Outstanding Volunteer Award. In 2020 Karu won the IEEE New South Wales Section Outstanding Volunteer Award.

Karu is the Distinguished Professor in Electromagnetic and Antenna Engineering at the University of Technology Sydney. He is a Past Chair of the IEEE Antennas and Propagation Society Distinguished Lecturer Program.

Karu has published more than 650 papers and his h-index is 52.

Karu is a Finalist in the Australian national Eureka Prize for Outstanding Mentor of Young Researchers.

<https://www.uts.edu.au/staff/karu.esselle>

He was 2020 Runner-up to the same prize. He won the 2019 Motohisa Kanda award for the most cited paper in *IEEE Transactions on EMC* in five years. He was also identified, in 2019 by *The Australian* newspaper as national research field leader in Australia in both Microelectronics and Electromagnetism.

Karu has served the NSW Section since 1995 in multiple capacities and during his term as NSW Section Chair(2017-2018) the Section won Region 10 Gold and Silver Awards and Sydney hosted the highly successful IEEE Sections Congress in 2017.

He instigated the formation of the Macquarie University Student Branch and was their branch counsellor until he moved to UTS. Under his guidance Macquarie University Student Branch won several Australia Council Student Branch Awards as well as a Region 10 Award. He mentored many PhD students who went on to successful careers in academia and industry and who are currently serving in volunteer positions with the NSW Section, chapters and affinity Groups. Macquarie University students figured prominently in the Australia Council Student Paper Contests, winning many prizes.

In recognition for his many contributions he was awarded the Outstanding Branch Counsellor Award by IEEE.

Karu is currently serving as a member of the IEEE NSW History Committee and served on the NSW Nomination Committee that was successful in gaining the IEEE Milestone Award for the Parkes Radio Telescope in 2019. He has contributed to many IEEE Conferences by serving on conference committees and as a keynote Speaker. He has and is currently serving on several IEEE society committees and IEEE journals.

On behalf of IEEE NSW Section, I would like to thank Prof Karu Esselle for his many and invaluable contributions to IEEE and the NSW Section and wish him all the best for the future.

Tony Zaglas, IEEE NSW Section, Awards and Recognition Chair

History Committee, 2021

The History Committee was formed from the IEEE Milestone Award Organising Committee of 2018-20 for the successful Milestone Award to the CSIRO radio telescope at Parkes, NSW in 2019. We meet regularly (every month for lunch if allowed), and will be pleased for all members to participate in our activities.

A number of significant anniversaries, celebrations and events for the NSW Section will be coming up in the near future. The History Committee of the NSW Section will be releasing information about the planning and organisation of these activities as soon as we can.

In 2022 we will be celebrating 50 years of IEEE active presence in Australia. The first Section in Australia was created here in Sydney in 1972 and was called the Australian Section, before it evolved into the NSW Section. We are planning an appropriate celebration of this very important event.

There will be separate information provided to all members about this celebration, which will include a member's meeting to celebrate the birthday, together with a celebration dinner for all those who may wish to attend, with the possibility of staying over at the hosting venue (possibly regional).

There are also anniversaries and celebrations in 2021, when the Australian Council is celebrating 35 years since its formation. The NSW Section was a foundation member of the Australia Council. The Section Chair has information on this activity, and has asked for personal data from members.

The History Committee is also looking at possible future Milestone Awards within the NSW Section.

These include;

The (Aircraft) Instrument Landing System that was developed at Sydney University, and trialled at Sydney Kingsford Smith Airport,

The Calculable Capacitor, invented by Professor Doug Lampard of CSIRO/NML, then at Sydney University and later at the University of New South Wales.

The Snowy Mountains Hydro Electricity Scheme,

And others yet to be selected

The IEEE has approved over 200 IEEE Milestone Awards worldwide, where our "Dish" Award in 2019 was number 201. With such prestigious awards, unfortunately there comes a cost, and depending on circumstances this can be up to \$20k. For the CSIRO award, the NSW Section funded \$3k seed money, and the remaining cost was sponsored from donations by CSIRO, Parkes Council, the A&P Society, together with previously allocated funds that were unspent. Serious thought needs to be given for the funding of each project nominated, together with all future anniversary celebrations.

A Calculable Capacitor milestone might be hard to finance - there aren't many of them around to celebrate.

Graeme Gwilliam, Co-Chair, History Committee.



IEEE NSW Local Activities

Our NSW Section will be organising one special event in 2022 – the “Golden” anniversary of the formation of the NSW Section on August 16, 1972, with headquarters in Sydney. The NSW Section plans to celebrate and commemorate this significant and important 50th anniversary.

Historically, it was the IEEE Australia Section that was founded on August 16, 1972; the Australia Section then encompassed all of Australia and Papua - New Guinea. As the activities of the Australia Section expanded, separate Sections were formed in all the Australian States. The Victorian Section was the first to split off from the Australia Section. The Australia Section was eventually renamed as NSW Section, located in Sydney in December 1985 and at the same time the Australia Council was formed, to coordinate the activities of all the Sections in Australia.

In 2022, NSW Section will have the honour of celebrating the “Golden” anniversary of the establishment of IEEE local activities in Australia - not just in NSW. The History Committee of the NSW Section, all of whom either are past Chairs or the current Chair of the NSW Section, is working hard in planning this memorable celebration. A companion article in this issue of Circuit covers what is planned.

Benefits of a local IEEE presence

IEEE is the world's largest technical professional organisation committed to advancing technology for the benefit of humanity. It is probably fair to say that many Australian Electrical and Electronic Engineers would join the IEEE irrespective of whether there is an IEEE local Australian presence or not. This makes it reasonable to ask what difference does a local IEEE presence makes? Basically, a local IEEE local presence can make it easier to access the wealth of technical information, professional, educational and networking opportunities, that IEEE offers.

Below is a selected list of the benefits of a local presence:

Attracting International Conferences to Australia:

A local presence can attract prestigious IEEE conferences to Australia. Many high-prestige IEEE conferences have now been hosted in Australia. It took some time after the founding of the Australia Section before we succeeded in attracting even one important IEEE conference to Australia were successful and it wouldn't have happened if there hadn't been a local Section.

A good example is Globecom 98, the IEEE Communications Society's flagship conference, which Sydney hosted in 1998, through the efforts of the NSW Comms/SP Chapter and the NSW Section. It was enormously successful and became the biggest IEEE conference to be held in Australia for a long time; in fact, the biggest telecommunications conference in Australia up to that time and since. Its success provided a big input to Australian communications researchers and industry.

It also put a lot of money into the IEEE NSW Section bank account. Before then section had been struggling to break even, but since then it has had a couple of years income in reserve. None of this would have been possible without the IEEE local presence, and the efforts of the local members at the time.

Distinguished Lecturer Program:

Bringing distinguished IEEE lecturers to Australia is another important program that is of great value to members. There have been many eminent electrical engineers who have come to Australia on behalf of the IEEE, presenting excellent lectures to members on important topics. Without local members to invite the visiting speakers and organise the lecture venues and the audiences, this wouldn't happen.

IEEE Milestones:

The IEEE Milestones are a significant program for recognising internationally important achievements in the electrical, electronic and computing fields. Australia's first IEEE Milestone was unveiled in October 2019 at the Parkes radio telescope, to record its role in receiving the signals from the moon during the first human moon landing in August 1969. The NSW Section got in before anybody else could snaffle the glory.

The committee is thinking about putting forward the Thompson-Lampard calculable capacitor as second milestone. It's a lot less well-known - every National Standards Laboratory around the world has at least one Thompson-Lampard calculable capacitor as it's primary standard of capacitance - but it has no other application. As a piece of ingenuity, the 1957 Thompson-Lampard Theorem takes some beating, but you won't see TV programs about it.

Raising the Profile of the Electrical Engineering Profession:

A local IEEE presence provides a platform for members to interact with local technical and non-technical communities, and can draw upon the wealth of IEEE technical knowledge to be disseminated locally. All such activities and interactions inevitably raise the profile of the electrical engineering profession within the community, though we do have to be careful that information being disseminated is interesting enough to hold the attention of the audience,

Ramutis Zakarevicius, Chair, History Committee

"IEEE 50 years in Australia" Celebration Book

As a part of the "IEEE 50 years in Australia" celebrations, we are planning to produce a book, as a permanent record of what we think has been important about the IEEE presence in Australia over the past 50 years.

As is traditional, it is expected that the book will record the activities of all the principal office-holders over these 50 years, with discussion of those activities, and those individuals, which struck the History Committee as notable.

To enliven the text, we are hoping that some members will provide brief (150 word) anecdotes of some of their more memorable experiences (perhaps including features that some might prefer forgotten), from both IEEE activities, and the process of getting to and from these activities, including booking disasters.

When travelling on behalf of the IEEE, we have all been stuck in airport lounges for hours, and missed the occasional connecting flights, etc., sometimes with unexpected outcomes.

On one occasion, my bags were held at the airport at Miami, Florida because of a four day weather delay in services around the Caribbean. When I eventually flew on to San Francisco, as originally intended, my bags went off in the opposite direction on an aircraft to Port of Spain. We were eventually successfully reunited in the airport in San Francisco. That did leave me with a 6 hours wait before I could get onto my QANTAS flight to Sydney. As the mouse said "... thereby hangs a tale ...".

Please tell us about your experiences. Date for submissions will be advised to be sometime early in 2022.

Graeme Gwilliam, Co - Chair, History Committee



IES-Inter Chapter Paper Competition in 2021:

A Single-Source Common-Ground Switched-Capacitor Nine-Level Inverter Suitable for High-Frequency AC-Microgrid Applications

Authors: Reza Barzegarkhoo, Majid Farhangi, Ricardo P. Aguilera, Yam. P. Siwakoti, and Dylan Lu

Champion; Sydney Chapter

The viable and reliable performance of high-frequency ac (HFac) power distribution systems has been proven in aerospace and military applications for the a few decades now.

The concept of using HFac systems in newly developed microgrids for the integration of renewable energy (RE) sources is relatively new, where single-phase high frequency (HF) buses covering a range of 400Hz to 1kHz are used to integrate RE resources with the loads and the grid. To exploit RE sources like fuel cells and photovoltaic (PV) arrays in such microgrids, the role of power electronics converters is important, because their outputs usually have to be connected in series and in parallel to increase their power handling capacity. Apparently power handling capability is the major challenge for such inverters, which calls for complicated phase and amplitude synchronization with the HF buses.

The conventional configuration of such types of inverters is based on two or three-level resonant converter with a voltage step-down feature. This introduces two other disadvantages - the large value of the required output filter and the dependence on an HF transformer to enhance the output voltage of the inverters to match the peak voltage of the HFAC-microgrid.

Multilevel inverters are a promising technology for the interface to this type of microgrid because they can handle the power levels that need to be injected into the grid, and they are able to mitigate the size of output filter/line impedance by generating a staircase approximation to the desired sine wave of output.

Their performance and circuit features need to be improved to make whole the system more compact, efficient and robust. The aim of this article is to propose a novel nine-level nine-switch inverter with the capacity to boost voltage in a single power processing stage, common-grounded (CG) between the input and output, which can prevent the leakage current propagation issue, and is suitable for a compact manufacturable design.

The proposed converter was designed to deliver 1.2kW of injected power, under closed loop control. The proposed circuit and the fabricated prototype/setup pictures are illustrated in Fig. 1 and 2, respectively. To test the converter in practice, a PV emulator with 200 V input voltage was used to feed the converter. The HFac bus was also provided through the 220V/400 Hz grid-simulator. The final experimental results from the nine-level inverter showed a peak output voltage of 400V (implying that the converter could double its inputvoltage), delivering an injected grid current with a peak amplitude of 8A.

The input current waveform of the PV emulator, and the grid voltage are shown in Fig. 3. A measured efficiency of better than 97% was eventually achieved over a wide range of injected power levels, which demonstrated the efficient performance of the proposed inverter.

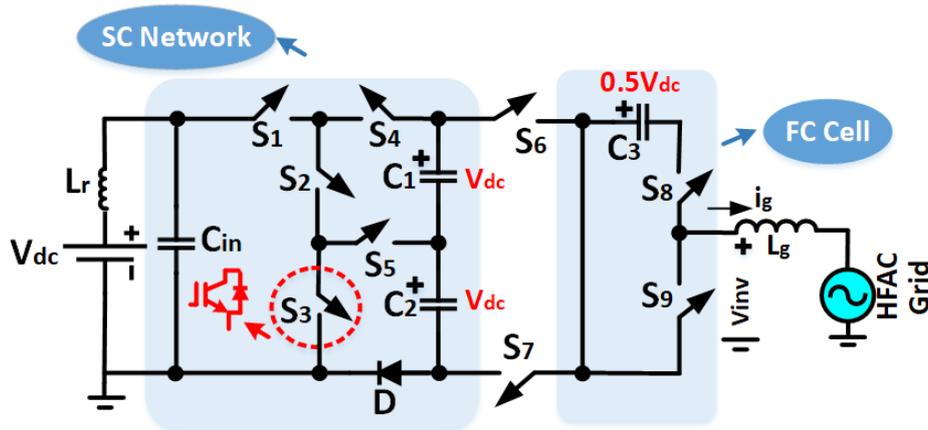


Fig. 1. The proposed 9L9S-CGSC-Inverter

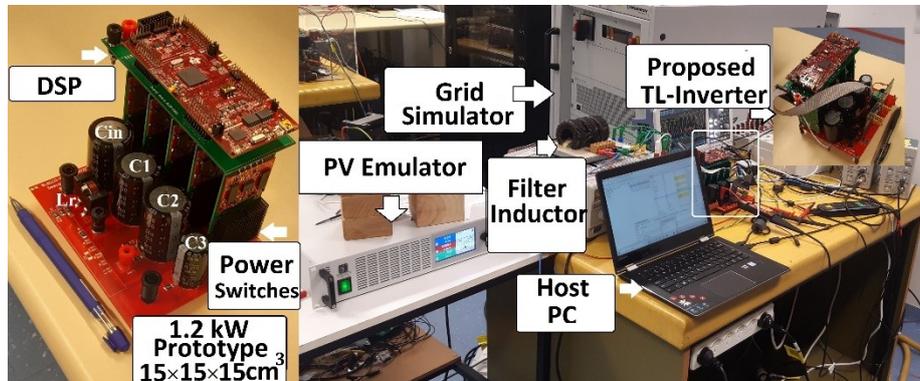


Fig. 2. The fabricated prototype and the measurement setup.

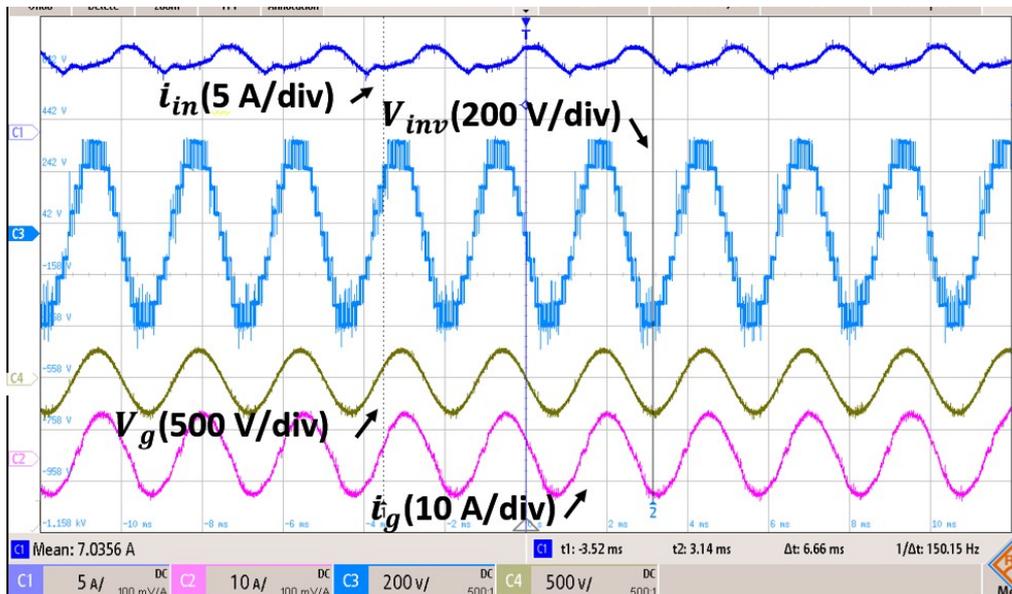


Fig. 3. The captured experimental results at 1.2Kw injected power.

IEEE STEM Ambassador Appointment

After 6 years of promoting and presenting STEM Education material to hundreds of school teachers throughout NSW and ACT, Dr Graeme Gwilliam, FIEAust. a retired Chartered Professional Engineer, and resident of St Patrick's Green in Kogarah, has been selected as an IEEE STEM Ambassador for 2021 by the Institute of Electrical and Electronic Engineers, Inc. (IEEE).

The IEEE introduced this role in 2021, and Graeme is one of over 40 appointed around the world to be the first ambassadors.

Graeme has contributed voluntary assistance to various groups and organisations in the community, Australia and Internationally for over 60 years, starting as a young Scout Leader at 1st Kogarah Scout Group, after he had completed his Queens Scout Award some years earlier.

His interest in technical education developed after he made a career change from working as an Engineer, to teaching Electrical Engineering in various Colleges and Universities in NSW. After retiring from full time employment, he has subsequently been appointed as a Visiting Fellow at The University of New South Wales, and Macquarie University.

Graeme has previously received an IEEE Region 10 Outstanding Volunteer Award (OVA) in 2017. Each year about 3 of the 1000,000+ IEEE volunteer members in Region 10 (ASIA, South-East Asia, and Australasia) are recognised for the contributions they have made to the IEEE locally and worldwide.

The appointment of IEEE STEM Ambassador for 2021 is made by the Education Activities Board within the IEEE.

The Education Activities Board among other things, provides lesson plans and support STEM education material for students and teachers of STEM with over 150 lessons covering all aspects of STEM education, Some of the more popular lesson plans have been educationally aligned to the Australian National Curriculum,

<https://site.ieee.org/queensland/chapters/tisp/>

and all can be used as a teaching resource.

A list of the lesson plans in each group, with a brief description of each plan, can be seen at the following addresses;

- Tryengineering <https://tryengineering.org/teachers/lesson-plans/>
- Trynano <https://trynano.org/education-resources/nanotechnology-lesson-plans/>

The lesson plans cover subject areas of Science/Materials (Trynano.org), Technology/ Engineering (Tryengineering.org) and Mathematics/Computing. They are available for school or home activities, at no charge, and can be downloaded by simply entering the links into a search engine of a computer or phone. They are designed to be cheap, and generally use materials that are commonly available.

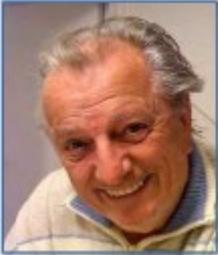
Each lesson plan comes complete with teacher notes, and student reading material, and is structured to be conducted as an activity in the classroom. A complete materials list for each activity kit is also available, using simple items. Each kit should not cost more than \$4.00 for a group of 4 students, and it is usually possible to re-cycle most of the material used over many classes.

Access to the lesson plans is available electronically and all can be printed freely from the above addresses. All are ideal to be used as resources that can be adapted as may be needed.

Although written for USA school students, some lesson plans have been aligned to the Australian National Curriculum.

For further information contact;

Dr Graeme Gwilliam (Tel 9587 5340)





CALL FOR PAPERS

Organizers

General Co-Chairs

Mike McShane
Texas A&M University, USA

Subhas Mukhopadhyay
Macquarie University, Australia

Technical Program Co-Chairs

Kourosh Kalantar-zadeh
University of New South Wales (UNSW), Sydney NSW, Australia

Gijs Krijnen
University of Twente, The Netherlands

Important Dates

May 6, 2021

Proposals for Tutorials

May 6, 2021

Proposals for Focused Sessions

June 18, 2021

Paper Submission Deadline
(Max 3 pages of text + 1 page of references)

August 9, 2021

Notification of Paper Acceptance

August 30, 2021

Submission of Final Papers

Visit the website for the most up to date information relating to abstract submission, tutorials, and special sessions information and deadlines.



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 2021 to the 30th September 2021.

New Fellows

None

Life Fellows

We have two new life fellows.

Branko	G	Celler	Willy	Zwaenepoel
--------	---	--------	-------	------------

Life Senior Members

We have twelve new life senior members. Sanjib Choudhury is an active member, and David E Burger has done stuff from time to time.

Eliathamby		Ambikairajah	Lionel	V	Ascone
Neil	R	Browne	David	E	Burger
Sanjib		Choudhury	Ashok		Manglick
Anthony	M	Morrissey	John	D	O'Sullivan
Bao	Toan	Phung	Irina	R	Rabeja
Anatoly	B	Rosenfeld	Darmawan		Sutanto

Life Members

We have twenty new life members. Dapeng Tien is an active local member and a past chair.

Alberto	E	Ampil	Bill		Bolton
Colin		Cohn	Eugene		Doma
Alan	H	Ford	Paul	A	Greenfield
Leon	E	Hooper	Bulend		Kutsal
Peter	W	Lo	Benno		Motha
Philip	T	Nicholson	Petri	I	Nuutila
Alfred	C	Papallo	John	A	Slade
Paul	D	Smith	Dapeng		Tien
John	A	Watson	Stephen	S	Webb
W	S	Weerasinghe	David	A	Williams

Senior Members

We have seven new senior members.

Saad	UI	Hasan	Frank		Jiang
Weihua		Li	Tongliang		Liu
Ruimin		Pan	Stuart	W	Perry
Teresa	A	Vidal-Calleja			

Members

We have a lot more new members - 184 of them.

Abolfazl		Abdollahi	Fuzi	Abusa
Fariha		Afsana	Al Jumlat	Ahmed
Fowzia		Akhter	Md. Parvez	Akter
Md Zahangir		Alam	Md. Mubashir	Alam
Stefano		Aldini	Ahoud	Alhazmi
Muhammad		Ali	Hamzeh	Aljarajreh
Mahathir		Almashor	E M Geethan Sathsara	Ambanpola
Felipe		Arrano Vargas	Stephanie	Ascone
Arief Rachman		Ashar	Shajir	Askari
Cameron		Aume	Thushal	Babukumar
Anthony J		Bagala	James	Balding
Spandana		Bandlamudi	Julie Stephany	Berrio Perez
Asmita		Bhattacharya	Michael	Brooks
Robert		Bullen	Yongbo	Chen
Lisheng		Chen	Kai	Chen
Yitian		Chen	Winston	Chenn
Aaron P		Chippendale	Ishmam Ahmed	Chowdhury
Guoyu		Chu	Raffaele	Ciriello
Dean A		Cooper	Alistair	Craib
Tim		Curtis	Roshan Mark	De Alwis
Preetpal Singh		Dhillon	Raman	Dhiman
Matthew James		Dsouza	Milos	Dubajic
Saurav Anil		Dubey	Mounzer	EL Hallak
Gaelle Marie		Emvalomenos	Xiaochen	Fan
Mena		Farag	Georgia	Fardell
Angus Murdoch		Ferguson	Jaime Andres Garcia	Marin
Yuhao		Ge	Fillipe	Georgiou
Nargess		Ghassempour	Petros	Gionis
Vivasha		Govinden	James Alexander	Greer
Gunaratne Gamage Pamitha Dinuka Gunaratne			--	
Amal Delpachchitra Arachchige Gunatilake			S	Hall
Rasedul		Hasan	Yi	He
Yang		He	Heranudin	Heranudin
Nigel		Herring	Jason	Hodges
Md Bellal		Hossain	Wanming	Huang
Yao		Huang	Huaxi	Huang
Ragy		Ibrahim	Md. Minarul	Islam
Sathyanarayanan		Jaganath Rao	Tony	Jan
Faizan		Javed	Sadari Samanmalie	Jayawardena
Yubai		Jiang	Cameron	Jones
Marcel		Julliard	Nicholas	Killeen
Killian		Kinsella	Arslan	Kiyani
Abhijit		Kollareddy	Scarlet	Kong
Emil		Koutanov	Tin	Lai
Abdallah		Lakhdari	Anh Tuyen	Le
Ngoc Phuc		Le	Ki Myung Brian	Lee

Yannan		Li	Siyuan	Li
Yaran		Li	Fucun	Li
Jiacheng		Li	Yee Yan	Li
Jiayin		Lin	Hangrui	Liu
Baolei		Liu	Yizhou	Luo
Yiju		Ma	Zaidoon Adel	Magaref
Sidra		Malik	David John	Mansfield
Harry		Marquis	Khawaja Fahad	Masood
Sourabh		Mishra	Imran	Mohammed
Sarumathi		Murali	Guzel	Nagaeva
Bahram	Vazir	Nezhad	Harry	O'Donnell
Halayudhar	Reddy	Palle	Timothy Michael	Patten
Xueping		Peng	Stefania	Peracchi
Hoai	Nam	Pham	Sang The	Pham
Huy	Cong	Phi	Geedhika Kallidil	Poduval
Asim		Pokhrel	Simon K	Poon
Jessie	Ann	Posar	Noushin	Poursafar
YanyiI		Pu	Robin Chacko	Puliparambil
Ling		Qi	Yongliang	Qiao
William	Luke	Raffe	Obaidur	Rahman
Farhan	Ahnaf	Rashid\	Javad	Rezazadeh
Patrick		Rufangura	Kirriily	Rule
Ranjan		Sadhu	Pejush Chandra	Sarker
Mohammad	Mousa	Shalby	Brady	Shearan
Conna	David	Sheedy	Yu	Shen
Smitha		Shivshankar	Md. Asif Alam	Siddiqui
Catherine		Simpson	Sarvesh Kumar	Singh
Isheeta		Sinha	lizhao	Song
Mahendra		Subedi	Ronald Buenaflor	Suello
Sean		Tan	Muhammad Saad	Tariq
Omid		Tavallaie	Erol	Teber
Bharat		Thapa	Mallikarjuna Reddy Reddy	Thippareddy
Michael		Towke	David	Tsai
Anton		Tutoveanu	Muhammad	Uzair
Michelle		Vaqueiro Contreras	Henry	Veng
James		Vohradsky	Anne Marie	Vuong
Bowen		Wang	Rui	Wang
Dinindu	Koliya Harshanath	Webadu Wedanage	--	
Kyle	Luke	Whitton	Ridho Wastu	Widyawan
Xiaowei		Wu	Jianqing	Wu
Chantelle		Wyllie	Xiaoke	Yi
Shiduo		Yu	Jian	Zhang
Qi		Zhang	Jiaxi	Zhang
Yinzhe		Zhang	Yuming	Zhang
Jiahong		Zhao	Shanshan	Zhao
Qiwei		Zhao	Ziwen	Zhou
Yechen		Zhu	Belinda	Ziesig

Associate Members

We have nine new associate members.

Storm		Bartlett	Peter Thomas	Bryant
Charles	Antonio	Chen	Pratik Dipak	Raut
Muhammad	Saad	Salman	Dylan Nicholas	Sheaves
Scott	Pierson	Skipworth	Xinghao	Yang
Guangze		Zeng		

Affiliate Members

We have no new affiliate members

Graduate Student Members

We have 64 new or upgraded graduate student members.

Ahmed	Abdulelah	Ahmed	Samrah	Arif
Sepehr		Ashtarinakhaei	Noah	Bos
Qifan		Chen	James	Cox
Hassan		Dehghani	Zehao	Duan
Irma		Dupuis	Augustus	Elton
Gabriel		Garcia	Matthew	Garrett
James	Lyndon	Gray	Jiaxian	Guo
Jason		Hambly	James	Henderson
Kavindie	Hansika Hewa	Katuwandeniyage	Linh Manh	Hoang
Nicholas		Hoyle	Sk Razibul	Islam
Mingshan		Jia	Shuang	Jiao
Vikas		Johri	Md Sarwar	Kamal
Sharad		Kapoor	Farshid	Keivanian
Ashwaraj		Kottu	Xuemeng	Liu
Liroy		Lourenco	Yuezhu	Lu
Wilhelm	Johan	Marais	Arpit	Mathur
Alexander	George	Minton	Huynh	Nguyen Van
Siri		Padmnabhan	Md Shamsur	Rahim
Ahalya		Ravendran	Mohsen	Rezaei
Brad	Kyle	Rice	Xinhui	Rong
Nazmus		Sakib	Masoud	Salehpour
Steve		Sam	Anuradha	Samkhamraju
S M Showybul		Shahakib	Zhiwei	Shen
Anwaar	Younas	Subhani	Neethu	Thomas
Yuzhe		Tian	Yumeng	Tian
Yingyu		Wang	Li	Wang
Qigejian		Wang	Xuesong	Wang
ChiYan		Wong	Qianli	Xing
Yufei		Xu	Yi	Yang
Yu		Yi	Taylor Reid	Young
Qinheng		Yu	Ziyue	Zhang
Yongmei		Zhang	Xinqi	Zhu

New Student Membership

We have 22 new student members.

Adhil		Badat	Alberic	Evan Scott	Benjamin
Thomas	Patrick	Bevan	Jeff		Cisco
Abin		Gurung	Andrew		Jack
Simandeep		Kaur	Danny		Keo
Ali		Khosravi	Ifeanyichukwu	Chiadika	Meneke
Zachary	Scott Don	Mitchell	Liam	Kennedy	Moy
Tim		Pickard	Rowan		Ramamurthy
Alain	Gordon Tibaldi	Roberts	Ali	Hasan M	Siddiq
Kris		Simpson	Phuc	Hong	Tran
Rene		Vuljanic	Zishan		Wang
Caleb	Jason	Watts	Dallas		Yan

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



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

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

Name:

Member No:

Address: Postcode:

Tel:

(H)..... (W)..... (M)..... FAX.....

Email:

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



Patents | Trade Marks | Designs

View our attorney profiles at:

www.adamspluck.com.au

Phone us on 02 9476 0477 to discuss your IP requirements

Building Business Assets

Suite 3, Level 1, 20 George Street Hornsby NSW 2077

Fax: 02 9987 2405 E: email@adamspluck.com.au