

Contents

- 01: IEEE UJ SB holds Exco Handover & Training
- 02: Feature Article on eMotor Design for 4IR
- 03: Senior Member Elevations for 2023
- 04: Call for Papers: PAC 2024
- 05: IEEE South Africa gets New Chapter

IEEE UJ SB holds SB Exco Handover and Leadership Training

Lentsu Mafiri, *IEEE UJ SB Secretary* and Zizo Madlala, *IEEE UJ SB Chair*

The IEEE Student Branch at the University of Johannesburg (IEEE UJ SB) successfully conducted its Executive Committee Handover and Leadership Training on November 17, 2023 at 14:00 SAST. The event aimed at facilitating a seamless transition between the outgoing and incoming executive committees, fostering leadership skills among the participants, and promoting a sense of community within IEEE UJ SB.

The event commenced with a warm welcome from the electoral committee member, Lebogang Moloto, signaling the official start of the proceedings. IEEE UJ SB counselor, Prof. Omowunmi Mary Longe, delivered the opening address, setting the tone for the event and emphasizing its significance. Prof. O. M. Longe provided valuable insights into IEEE and the Student Branch including the history of the SB how it grew from the first IEEE Smart Village Student Chapter in the world to a full-fledged IEEE SB thereby, offering context and understanding to the attendees.

Dr. Udochukwu Bola Akuru, the IEEE South Africa Section Chair conducted a comprehensive leadership training session, focusing on developing essential skills for effective leadership within the IEEE Student Branch at UJ. Participants were given the opportunity to engage in a lively question and answer session, fostering interaction and clarification on various topics.

Mr. Thabang Moliane, the outgoing SB Chair, presented a detailed report summarizing the accomplishments and activities of the outgoing executive committee during their term. Due to circumstances beyond his control, he couldn't join the meeting in person but joined on MS Teams.



IEEE SB UJ HANDOVER AND LEADERSHIP TRAINING (present in picture): UJ SB Counselor, Omowunmi M. Longe and cross-section of participants.



IEEE UJ SB LEADERSHIP TRAINING (present in picture): IEEE South Africa Section Chair, Udochukwu B. Akuru and cross-section of participants.

“Participants were given the opportunity to engage in a lively question and answer session, fostering interaction and clarification on various topics.”

The newly elected executive committee members were introduced, symbolizing the official transfer of leadership after an official handover from the old to the new ExCom where 2023 SB Chair, Thabang Moliane was represented by the SB Vice-Chair, Kutlwano Bologang. Thereafter, Miss Zizo Madlala, the incoming SB Chair, delivered an inspiring speech outlining her vision and plans for the term. **(continued on page 3)**

Design and Modelling of Electrical Machines: Catalysts for 4IR

Karen S. Garner, *MIEEE*, Pr. Eng. Stellenbosch University (e: garnerks@sun.ac.za)

As the Fourth Industrial Revolution (4IR) advances in our society, the role of electric machines stands out as a crucial factor in powering the technologies that define this era. Industries worldwide are embracing automation, artificial intelligence, and interconnected smart systems. Motors and generators are the workhorses behind the electrification of various processes. As such, the design and modelling of electric machines is pivotal in driving efficiency, sustainability, and innovation.

Our society needs machines that not only deliver high performance but are also intelligent, adaptable, and energy efficient. Designing such machines involves a multidisciplinary approach that integrates electrical engineering, materials science, and advanced control systems. It also requires us to look critically at existing technologies and find innovative ways to improve these systems. In many cases, it is not always possible to simply replace components and systems. This presents a challenging context which requires engineers and researchers to work closely together.

One key aspect of designing electric machines for the 4IR is efficiency optimisation. With sustainability at the forefront of industrial priorities, energy-efficient machines play a crucial role in reducing carbon footprint. Methods to improve the classical machine designs at the conceptual level are highly sort after. From look-up

tables to numerical methods and the application of neural networks, the objective is to produce efficient and robust designs in minimal time. Machine learning and artificial intelligence are increasingly being integrated into the modelling process, allowing for predictive maintenance, fault detection and adaptive control strategies. At industry level, advanced cooling systems to minimize energy losses and maximize overall efficiency remain a prevalent concern and focus.

Electric machines are no longer standalone entities, and the design process must consider communication protocols, data exchange mechanisms, and real-time monitoring capabilities. Modelling these interconnected systems allows engineers to predict and optimize performance, contributing to the seamless integration of electric machines into the fabric of the 4IR. With electric vehicles also becoming a prominent player in the 4IR, the design and modelling of electric machines are paramount. Power density, range, and reliability create a delicate balance in the design conditions for EV's to ensure that they meet the stringent requirements of modern transportation. Although permanent magnet machines are (*continued on page 3*)

Know Your Technical Chapters and Societies

From the next issue of this *eNewsletter*, we start will featuring a number of technical chapters/joint chapters, societies, student branches and affinity groups within our Section, to highlight their presence, technical interests, member benefits and relevant activities/events. We therefore call on chapter chairs and other relevant officers to send their inputs via a Google form that will be sent out in due course.

IEEE South Africa Section e-Newsletter

Editor-in-Chief: Udochukwu B. Akuru

IEEE ZA website:

<http://www.ieee.org.za/>

Send your news and articles:

joyce.mwangama@ieee.org

IEEE South Africa ExCom

Section Chair: Udochukwu Akuru

Vice Chairs: Komla Folly & Richard Millham

Secretary: Joyce Mwangama

Treasurer: Jacques van Wyk

Past Chair: David Oyedokun

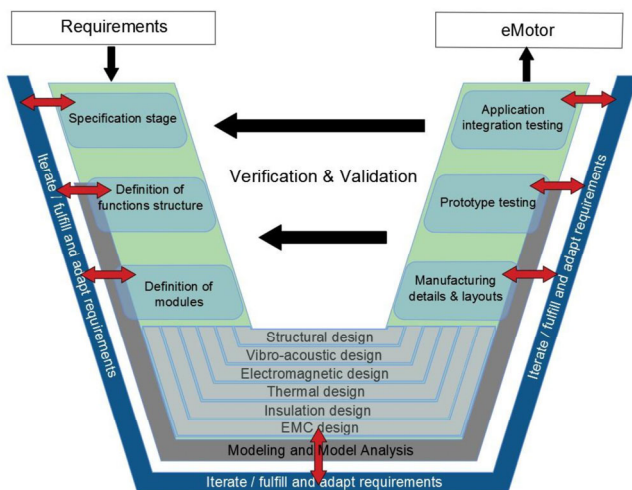
IEEE South Africa e-Newsletter is a quarterly newsletter, published by IEEE South Africa ExCom to keep its members within the Section updated on programmes, initiatives, events, and activities. This publication is here to showcase events, achievements, and news items from across the Section. It is also a medium for reporting on past events, meetings or stories, with the ability to promote future events. We welcome reports, stories and general content, including photos, which can be emailed to us. **The deadline for content submission for June 2024 issue is May 31, 2024.**



The Institute of Electrical and Electronics Engineers

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Source: <https://doi.org/10.3390/app11010294>



IEEE UJ SB LEADERSHIP TRAINING (present in picture): Outgoing SB Chair, Thabang Moliane.



IEEE UJ SB LEADERSHIP TRAINING (present in picture): Incoming SB Chair; Ms Zizo Madlala, Outgoing SB Vice Chair; Mr Kutlwano Bolokang. Communication Society SC Chair; Ms Zinhle Mazibuko, Computer Society SC Chair; Mr Tshepiso Mabunda, Power and Energy SC Chair; Mr Bonginkosi Dlamini, Woman in Engineering SC Chair; Ms Zinhle Msiza, Incoming Secretary General; Mr Lentsu Mafiri, Incoming Technical Secretary; Mr Tshepang Silaule, Incoming SB Vice Chair; Ms Elated Silinda. (From left to right).



IEEE UJ SB LEADERSHIP TRAINING (present in picture): Group photo of all participants at the event.

continued from page 1... IEEE UJ SB Handover

To wrap up the day’s event, certificates and gifts were presented to the outgoing executive committee members, acknowledging their dedication and service. A delightful entertainment segment where refreshments were provided gave the attendees a refreshing break in the program with support from the Section. Lebogang Moloto expressed appreciation for the successful execution of the electoral process and the

event. The event concluded with a virtual closing address from the 2023 IEEE SB UJ Chair, Thabang Moliane, summarizing key takeaways and expressing gratitude to all attendees, guests, SB Counsellor, Prof. O. M. Longe and invited speaker/Section Chair, Dr U. B. Akuru▪

continued from page 2... eMotor for 4IR

popular for special and niche applications, wound-field machines still constitute the majority of electric machine installations. In fact, wound-field machines remain a sustainable rare-earth free option and should not be left by the wayside when considering innovative design approaches.

From optimizing the motor efficiency to developing lightweight yet durable materials, every aspect contributes to the success of the electric mobility revolution. The design and modelling of electric machines are indispensable in propelling the Fourth Industrial Revolution forward. Engineers and researchers are tasked with creating machines that are not only powerful and efficient but also smart, adaptive, and seamlessly integrated into the interconnected web of 4IR technologies. As industries worldwide embrace this new era, electric machines serve as the backbone, driving progress and shaping the future of a sustainable and technologically advanced world▪

Senior Member Elevations

IEEE South Africa boasts 12 Senior Member elevations in 2023 as indicated below. IEEE Senior Membership is an honor bestowed only to those who have made significant contributions to the profession. Congratulations to our 12 colleagues on this well-deserved recognition! Visit the following link to learn more about the benefits and how to become a Senior Member: <http://www.ieee.org.za/becoming-senior-member-ieee>

Akinyemi	Lateef
ALONGE	AKINTUNDE
Barnard	Arno
Cox	Mitchell
Kamper	Herman
Lange	Tony
Mosamane	Simisi
OGBODO	EMMANUEL
Periola	Ayodele
Prinsloo	Tania
Quazi	Tahmid
Rix	Arnold

New Chapter Formed: IEEE Sensors Chapter



Congratulations! IEEE South Africa Section Sensors Council Chapter was recently formed. The effective date of this chapter formation is 30 January 2024. Ex-Com appreciates the efforts of Prof. Willem Perold (petitioner), who now doubles as the pioneer Chapter Chair. Prof. Perold is an IEEE Life Senior Member and is currently affiliated to Stellenbosch University at the Institute for Biomedical Engineering. IEEE Sensors Council of which the Chapter is formed under is an entity devoted to sensors, theory, design, fabrication, manufacturing, reliability and applications of devices for sensing and transducing physical, chemical, and biological phenomena, with emphasis on the electronics, physics and reliability aspects of sensors and integrated sensor-actuators.

In the coming days, Prof. Perold plans for the Chapter to arrange Technical Meetings (including Conferences, Workshops and Technical Presentations) with multi-disciplinary coverage of many topics, including (but not limited to): - Sensor Phenomenology, Modelling and Evaluation - Chemical, Electrochemical and Gas Sensors - Microfluidics, Biosensors and Paper-Based Diagnostics - Sensor Materials, Fabrication and Packaging - Photonics, Image Sensors & other Optical Sensors - Sensor Systems: Signals, processing and interfaces, networks and IoT - Wearable Sensors and Systems - Physical Sensors: Temperature, Mechanical, Magnetic and others. In the long term, he says the main is to propose hosting the IEEE Sensors Conference 2027, in Cape Town, South Africa. We wish the new Chapter progress! More information about IEEE Sensors Council can be found here: <https://ieee-sensors.org/>

SAUPEC2024 held in Stellenbosch

The 32nd Southern African Universities Power Engineering Conference (SAUPEC2024) was successfully hosted by the Department of Electrical and Electronic Engineering, Stellenbosch University in conjunction with the South African Institute of Electrical Engineers (SAIEE), from 23 to 25 January, 2024. SAUPEC brings

together experts from the industry, academics and students in engineering, computer science and information technology to present research papers, network, and expand the fraternity that has been built as part of the SAUPEC legacy. Prof Maarten Kamper served as the General Chair for SAUPEC2024.

IEEE South Africa remains a technical co-sponsor of the SAUPEC legacy of which all reviewed, accepted and presented papers are published as proceedings in IEEE Xplore since 2022. This year's proceedings is already published and available at: <https://ieeexplore.ieee.org/xpl/conhome/1845924/all-proceedings>

Some highlights of this year's conference, include a tutorial session, keynote speeches by Dr Tobias Geyer – R&D platform manager at ABB Switzerland and Dr Peter Jan Randewijk – Energy System Operator in Denmark, as well as opening keynote speeches by DVC (Research, Innovation and Postgraduate Studies), Stellenbosch University, Prof Sibusiso Moyo and SAIEE President, Prof Jan de Kock. In total, there were 72 papers presented in different parallel sessions, including sponsor presentations, which numbered up to 8.

The penultimate day saw an elaborate gala dinner where the IEEE Section Chair, Dr Udochukwu Akuru was invited to give a brief speech on the roles and benefits of IEEE membership. Awards were also called and handed out during the gala dinner event. The best paper award went to Prof Jan de Kock of North-West University and is titled, "Exploring the impact of inductive current transformers on harmonic emission measurements for South African grid code compliance", while the SAIEE RMS Award for best student paper



SAUPEC2024: Cross-section of participants being addressed by SAIEE President, Prof Jan de Kock during the closing session.



SAUPEC2024 (L-R): Past Chair IEEE South Africa Section (2019 to 2023), Prof David Oyedokun (SMIEEE) of UCT, Prof Innocent Davidson (SMIEEE) of CPUT and Prof Akshay Kumar Saha (SMIEEE) of UKZN.

presentation went to Tariq Rouhani of Stellenbosch University, supervised by Dr Karen Garner, on the paper titled, “Design of a 3MW Wound Rotor Synchronous Generator and Permanent Magnet Synchronous Generator for Wind Turbines With Reduced Torque Ripple”.

Next year’s edition (SAUPEC2025), which will be 33rd in the series, is billed to be hosted by the Department of Electrical Engineering, Tshwane University of Technology, in Pretoria. Watch out for more details in the coming days.

Conferences/Workshops

The following IEEE sponsored conferences/workshops holding in South Africa/virtually are currently accepting papers or open for registration:

- The **11th IEEE PES & IAS PowerAfrica Conference** (PAC 2024) will be hosted in South Africa from October 07 to 11, 2024. The conference

theme is “Towards Ensuring Energy Security in Africa”. PowerAfrica 2024 is the leading conference on the African continent focused on addressing its power and energy challenges. The conference provides a forum for researchers, engineers, policy makers and practitioners from Africa and beyond to share and discuss research findings, innovative ideas, emerging technologies and solutions to pressing challenges in the African energy sector. Paper submission deadline: **April 15, 2024**. More information can be found here: <https://ieee-power-africa.org/>

- You are invited to the **2024 edition of the biennial conference of the South African IEEE Joint Chapter on Antennas and Propagation (AP), Microwave Theory and Techniques (MTT) and Electromagnetic Compatibility (EMC)**, which will be held in Stellenbosch, on 1 and 2 August 2024 at the Stias Conference Centre. This conference brings together engineers and researchers from industry and academia who work in fields related to AP, MTT, and EMC in South Africa. Students are particularly encouraged to attend, through a reduced registration rate and poster session. Abstract submission deadline: **April 14, 2024**. More information at: <https://ee.sun.ac.za/saieee2024/>
- You are invited to the first-ever all-virtual **World Microwave Congress 2024** to held May 2-5, sponsored by IEEE MTT-S and supported by leading industry players worldwide. This congress aims to deliver top-quality speakers, interactive industry workshops, and master classes tailored for students, young professionals, and practitioners alike. Sessions include a wide range of keynote talks, workshops, and masterclasses in the areas of RF system design, RF measurements, RFIC/MMIC design, trends in 5G/6G communication, and emerging quantum techniques. Early bird pricing ends on **March 15, 2024**. More information can be found here: <https://wmc-ieee.org/>



WORLD
MICROWAVE
CONGRESS

May 2-5, 2024
Virtual Event

Call for Proposals: IEEE Milestones

The IEEE Milestones program honors significant technical achievements in all areas associated with IEEE. It is a program of the IEEE History Committee, administered through the IEEE History Center. Milestones recognize the technological innovation and excellence for the benefit of humanity found in unique products, services, seminal papers and patents. Milestones are proposed by any IEEE member, and are sponsored by an IEEE Organizational Unit (OU), such as an IEEE Section, Society, Chapter or Student Branch. After recommendation by the IEEE History Committee and approval by the IEEE Board of Directors, a bronze plaque commemorating the achievement is placed at an appropriate site with an accompanying dedication ceremony. Members are encouraged to propose Milestones for significant achievements that took place in our Section. A list of achievements suitable for Milestones: https://ieeemilestones.org/List_of_Achievements_Suitable_for_Milestones IEEE South Africa has one achieved one milestone in the past: https://ethw.org/Milestones:First_Operational_Use_Of_Wireless_Telegraphy,_1899-1902 Follow this link for more info on how to propose a Milestone: https://ieeemilestones.ethw.org/Milestone_Guidelines_and_How_to_Propose_a_Milestone

Opportunities for Members

1. CALL FOR IAS-RELATED SERVICE-LEARNING PROJECTS THAT BENEFIT - HUMANITY

Target Applicants: Any person but at least team must constitute one IEEE Member

Highlights: Selected projects will receive up to \$10,000, mentorship, and resources.

Eligibility:

- Any IEEE member may apply for a grant
- IEEE Student Branches,
- IEEE Young Professionals, IAS Members, HKN Chapters, IEEE Sections, Faculty Members, Teachers

Application link: <https://tinyurl.com/2htfhnc>

More info: <https://tinyurl.com/4wr84svy>

Deadline: **May 1, 2024**

2. IEEEduino Student Contest 2024

Target Applicants: All IEEE Student Members

Highlights: IEEEduino is a student-focused hardware contest to inspire IEEE student and graduate student members in Region 8 to design, build, test and demonstrate an innovative project on an Arduino microcontroller. Innovators, makers, and developers across the region have an opportunity to take part in this hardware design and build competition, compete against others in IEEE Region 8, and win great prizes for both winning and participating!

Eligibility:

- IEEE Student and Graduate Members in R8
- Individually or in Teams of up to 3

Application link: <https://ieeeduino.org/compete/>

More info: <https://ieeeduino.org/>

Deadline: **March 31, 2024**

3. IEEE Entrepreneurship Africa Workshop

Target Applicants: All IEEE Members living in Africa

Highlights: Are you interested in commercializing your idea or invention and creating a business? Do you live in Kenya or Africa? Would you like to learn how to become an entrepreneur? The workshop will be held in Nairobi, Kenya, starting on 21 April and ending on 25 April with an East African Summit. The in-person event will be preceded by two virtual meet-ups in the weeks prior to the workshop to solicit ideas and form teams of approximately five people each.

Eligibility:

- IEEE Members living in Africa

Application link: <https://tinyurl.com/yc6x9yje>

More info: <https://tinyurl.com/mtvhc5vc>

Deadline: **March 11, 2024**

Call for Volunteers

There are various vacant officer positions in the section as follows:

- Student Activities Chair
- Webmaster/vTools Coordinator
- Women in Engineering Coordinator
- Educational Activities Coordinator
- Young Professional AG Chairs
- SIGHT Section Chair

We are therefore requesting for volunteer(s) to fill in these positions. To be considered, please send your CVs to: udochukwu.akuru@ieee.org.

2024 IEEE Africa Council Election

The 2024 Africa Council Election was recently organised and the following are the elected officers:

- Kouzou Abdallah, Algeria, IEEE Algeria Section Chair (2022-2023) (Chair-Elect)
- Ilhem Kallel, Tunisia, Past-Chair of Tunisia Section (2023-2024) (Secretary)
- Ahmed Madian, Egypt, IEEE Egypt Section Chair (2024 -2025) (Treasurer)

The Africa Council N&A Committee Chair in charge of organising the elections is Abdullateef Aliyu, while the current Chair of the Africa Council is Isaac Adekanye, IEEE Nigeria Section Chair (2000-2005). More information about the Africa Council: <https://site.ieee.org/africa-council/>

Call for Activities/Events

If you have other ideas of how IEEE South Africa Section can get involved in events and activities to facilitate and increase industry engagement, visibility, membership drive and community impact within our OU, please write to me at udochukwu.akuru@ieee.org. The Section will be happy to support these kinds of activities under existing technical chapters, affinity groups or student branches as long as it is properly articulated to promote our current mandate for attracting and retaining members of all grades.

IEEE 140th Anniversary

To celebrate IEEE's 140th anniversary, Saifur Rahman, IEEE Life Fellow and 2024 IEEE Past President invites you to visit to read the eBook – Inspiring Technology: 34 Breakthroughs – which offers just a selection of the milestones to which the past nearly century and a half have been witnessed. The link to the eBook, which can be downloaded for free, is available here: <https://online.flippingbook.com/view/689251980/>



IEEE Education Week is taking place from 14-20 April 2024! Visit educationweek.ieee.org to learn

how you can get involved! Help spread the word about IEEE Education Week by sharing events and updates with your region/section, helping organize local and virtual events, and more. Sign up to be an IEEE Education Week Ambassador: <https://bit.ly/492NQO2> #EducationAtIEEE

IEEE Local Groups

Interested in re-energizing our Section or responding to emerging trends? Want to engage members and non-members in technical and non-technical interests? Consider starting a Local Group!

Local Groups are a new concept within IEEE—low-overhead, agile, and efficient units to serve the interests of members and potential members. They can be organized around any IEEE area of interest, including interdisciplinary fields, and must have a minimum of two IEEE members as initial organizers. Activities can include events, workshops, and lectures, both in-person and virtual.

Some examples of Local Groups include:

- Climate Change
- Blockchain
- Entrepreneurship
- STEM
- AI — ChatGPT
- Impact of EVs
- Industry Engagement
- Technology History
- Cyber Security

The process begins with a petition to form the Group via vTools: https://vtools.vtools.ieee.org/home/local_groups To learn more about Local Groups, contact us at localgroups@ieee.org.

Appointments

- Congratulations to Sbusiswe Zizo Madlala, current IEEE UJ SB Chair, in her new role as *Student Representative for IEEE South Africa*. We wish you all the best in your new role.

IEEE PES & IAS

POWERAFRICA
CONFERENCE

2024

Johannesburg, South Africa



The 11th IEEE PES & IAS PowerAfrica Conference (PAC 2024) will be hosted in Johannesburg, South Africa from October 07 to 11, 2024. The conference theme is **Towards Ensuring Energy Security in Africa**.

PowerAfrica 2024 is the leading conference on the African continent focused on addressing its power and energy challenges. The conference provides a forum for researchers, engineers, policy makers and practitioners from Africa and beyond to share and discuss research findings, innovative ideas, emerging technologies and solutions to pressing challenges in the African energy sector. We invite researchers who work outside of the continent to come learn from the energy innovations emanating from Africa and share innovations and experiences from other regions of the world.

CALL FOR PAPERS!

THEMATIC AREAS

- ✓ Renewable Energy and Conversion Systems/Technologies
- ✓ Use of Data Science and AI in Power and Energy Systems
- ✓ Nexus of Electricity and Other Infrastructure Systems
- ✓ Power Systems and Energy Storage Systems
- ✓ Electric Mobility
- ✓ Distributed Energy Systems, Micro-grid Systems and Energy Access
- ✓ Control and Cyber-physical Systems in Power and Energy Systems
- ✓ Other topics on Energy and Applications

TYPES OF SUBMISSION

- ✓ **Full papers:** Full papers may be up to 5 pages in length following the IEEE conference paper format
- ✓ **Short papers:** Short papers are limited to 3 pages in length and may present early or complete research results, case studies, best practices and perspectives relevant to the conference themes.
- ✓ **Postgraduate forum papers:** The forum will be organized as a poster session however, high quality submissions to the postgraduate forum of more mature research will be considered for publication in IEEE Xplore.

ORGANIZING COMMITTEE

General Conference Chair
Josiah Munda - Tshwane University of Technology, South Africa

Vice-General Conference Chair
Augustin Mpanda - UniLaSalle Amiens, France

Local Organizing Chair
Pitshou Bokoro – University of Johannesburg, South Africa

Technical Program Chair
Mary Ahuna – Technical University of Kenya, Kenya

IMPORTANT DATES

- 29th February, 2024 Paper Submission Opens
- 15th April, 2024 Paper Submission Deadline
- 31st May, 2024 Notification of Acceptance
- 31st July, 2024 Camera Ready Submissions
- 16th August, 2024 Early Bird Registration Deadline
- 7th October, 2024 Conference Begins

FOR MORE INFORMATION

Visit the conference website for a detailed list of topics and paper submission process.
<https://ieeepowerafrica.org/call-for-papers>

Email: pac2024@easychair.org

Website
<https://ieeepowerafrica.org>

Scan for more info



All received papers will be peer-reviewed, and accepted papers that are presented during the conference will be submitted for publication in IEEE Xplore®.

