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IEEE PES eNews Update
2022 January-March Issue

The PES eNews Update is a quarterly publication of the IEEE Power and Energy Society. It is an adjunct of the IEEE PES Power and Energy Magazine. It is made available to everyone via the IEEE PES website.

Editor-in-Chief

Shaikh Fattah, Ph.D. SMIEEE, FIEB
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Expanding What’s Possible

During the last two years, it has been my great honor and privilege to serve as your President-Elect (2020-2021) and help fulfill the PES Mission – To be the leading provider of scientific and engineering information on electric power and energy for the betterment of society, and the preferred professional development source for our members.

I want to acknowledge that since March 2020, our lives have changed drastically. The COVID-19 swept across the world and impacted all of us. My deepest sympathy goes out to everyone who has lost a loved one, and my prayers are with those who are ill or suffering. The Power and Energy Society (PES) lost our own brave leader and dear friend, Frank Lambert. PES recognizes and appreciates Frank for his effective and exemplary leadership, integrity and dedication to the Society. In his PES roles, Frank made many friends around the world and his absence shall be deeply felt by all who had the pleasure of working and meeting him.

I also want to extend my gratitude to all of you for your efforts in keeping the lights on during this challenging time.

New Initiative in 2022

As your new Society President (2022-2023), I want to share with you what PES is committing to for the year to come. The total PES membership at the end of 2021 is 42,805
all-time high – a 7.9% increase over 2020. Most of the PES growth in 2021 is due to a large increase in student membership.

Frank said well in his March 2020 eNews interview, “There’s never been a time like today in the electric utility sector. Everything’s changing… the way we make it, the way we move it, the way we use it and the way we sell it… so many changes happening at the same time. The power industry definitely needs fresh, new talent to be able to address and integrate all of the changes that are coming.” One of PES’s goals is to “help engage the next generation to meet all of the changes coming our way,” and “we must work together to get the next generation involved and taking an active part in the leadership roles in PES as we move forward.”

Following the directions Frank set, the PES Governing Board (GB) at its January 2022 meeting endorsed a new initiative to improve PES nominations and appointments process. The new process will put out a call for nominations to the entire PES membership, and members will be able to nominate themselves or others for consideration. This effort would go towards not only increasing the diversity and inclusion of our community, but identifying new volunteers, particularly young professionals and student members to the PES leadership roles.

In addition, the PES Publications Board has already implemented an open call process and other improvements to increase transparency. You can view the changes here.

Reconnect In the Big Easy

After what will be four long years apart, the 2022 IEEE PES T&D Conference & Exposition (T&D) will provide an opportunity to reconnect as a global community of energy professionals April 25-28, 2022, in New Orleans. T&D is excited to announce the addition of the Smart Cities Pavilion. This dedicated pavilion on the exhibit floor will feature a variety of case study exhibits showcasing effective collaboration to make smarter cities a reality. Technologies will include smart street lighting, advanced electric vehicle charging infrastructure, sensors, intelligent monitoring, and more. In addition, conveniently located on the show floor, the new Innovation Stages will provide a unique forum to debut state-of-the-art technologies, and discuss practical product applications. While on stage, presenters will share case studies that offer insights into emerging trends and share valuable best practices. On the exhibit floor, you will be able to hear short presentations from some of the industry’s leading suppliers and knowledge providers.

T&D Utility Saver Package – To provide utilities with more opportunities to experience T&D as a team, an exclusive T&D Utility Saver package will be offered. It will allow you to send 10 utility employees, particularly young professionals, with full conference registration for a total of only $1,000, an enormous discount compared to the cost of traditional registration.
Technical Program – Our host utility Entergy has put together a world-class technical program with super sessions, keynotes, and panels. The 2022 technical program will feature conversations around the electrification of infrastructure, the integration and operation of renewables, and lessons learned from the pandemic and recent climate disruptions.

Networking Sessions for Students and Young Professionals – Each T&D conference is designed with unique programming and networking opportunities for the next generation of energy professionals to advance in their careers. Besides a student poster session and poster contest, a companion reception provides a relaxed environment for registered conference attendees to enjoy hors d’oeuvres and beverages while viewing hundreds of accepted papers in poster format. In addition, the conference has a Collegiate Program, offering an exciting and comprehensive schedule of student and young professional sessions and activities. The Collegiate Program is designed to help new talent launch successful careers in the power and energy industry.

New 2023 Grid Edge Technologies Conference & Expo

As we all know, 130 years ago a new industry, called electric power and light, was born. Throughout these years, the industry provided safe, reliable and cost effective electricity service. However, extreme weather – the main culprit – has increasingly affected the grid over the past 20 years. A trend that will likely continue. Millions of people around the world lost power at times when they needed it most. As power grids deal with an onslaught of heat waves, wild fires, winter storms, and stronger hurricanes, these kinds of power outages cost customers billions of dollars each year, and are happening more often, taking longer to fix, and harming more people. To help speed up the grid transition and meet climate change challenges, PES has launched a new Grid Edge Technologies Conference & Exposition to share the latest in grid edge technological developments. The inaugural Grid Edge Technologies Conference & Exposition will debut spring 2023 in San Diego, California.

The Grid Edge Conference & Expo will be held every two years, bringing technologists and energy professionals together that drive the future design and development of a reliable, resilient, and carbon free grid. Through unmatched technical education backed by IEEE’s esteemed standards, and the widest display of next-generation solutions, you’ll be equipped to build the grid of tomorrow.

Saifur Rahman - 2023 IEEE President

Last but not least, after volunteering at IEEE for more than 40 years, our own PES Past President, IEEE Life Fellow, Saifur Rahman, was elected as the 2022 IEEE President-Elect. I want to take this opportunity to thank Saifur for his remarkable accomplishments and a lasting impact he made on PES and IEEE. This is also the first time a PES member won the most coveted IEEE position in 50 years. Before he became the PES President in 2018, Saifur served as the IEEE Vice President, IEEE Publications Board; the PES Vice President
Publications twice; Vice President New Initiatives Outreach; the General Chair of the IEEE Innovative Smart Grid Technologies Conference for three years in Washington, DC.

Saifur was also the Editor-in-Chief for both IEEE Electrifications Magazine, and IEEE Transaction on Sustainable Energy, which has been one of the leading journals in the field. Saifur is an outstanding volunteer role model for all PES members to follow.

Both Saifur Rahman and the 2022 IEEE President Ray Liu will be speaking at the April 25-28, 2022 T&D. And with so many changes and new technologies in our industry, you won’t want to miss this year’s T&D. See you in the southern charm New Orleans.

Wishing you and your family a safe and healthy 2022!

Jessica Bian
PES President (2022-2023)

Jessica J. Bian is the 2022-23 PES President. She is a visionary leader and architect who has spearheaded the electric industry’s reliability metrics and grid-risk assessment. She is currently with Grid-X Partners. Before that, she was with the Federal Energy Regulatory Commission, Washington, D.C. Previously, she was the director of performance analysis at the North American Electric Reliability Corporation (NERC) in Atlanta, Georgia. Under her leadership, a total of 18 industry-wide reliability indicators were established for the first time to determine grid reliability, adequacy, and associated risks. She is widely recognized as a pioneer and trusted world leader in the field. Before joining NERC, Jessica was with PJM, ERCOT, and Westinghouse Electric. She received her B.Sc. degree from the Taiyuan University of Technology, China, her M.Sc. degree from the Electric Power Research Institute, Beijing, China, and her Ph.D. degree from Tulane University, New Orleans, Louisiana. She has had more than 70 articles published. She received the 2014 PES Wanda Reder Pioneer in Power Award for her technical achievements. She volunteers at the IEEE PES; was the PES Secretary from 2016 to 2019 and the PES President-Elect from 2020 to 2021. She is a Senior Member of the IEEE.
Welcome to the first quarterly edition of PES eNews (Jan-Mar Issue 2022). As I mentioned in the last issue of the monthly PES eNews, we are going to publish quarterly in the future. However, the live updates will be available online and on social media as the *early version*.

We have seen a decreasing trend in COVID-19 pandemic and thus few face-to-face events are reported. We pay tribute to our PES members who died during the pandemic, especially to our great leader PES President Frank Lambert. We are honored to get PES Past President Saifur Rahman as the IEEE President-Elect in 2022.

The first article of this new format of PES eNews is the Voice of the Governing Board Member: 2022-23 PES President Jessica Bian. I would like to quote some inspiring information shared by Jessica: “The total PES membership at the end of 2021 is 42,805 – all-time high – a 7.9% increase over 2020”. Really, it is a proud moment for PES members. She also shared information regarding some new initiatives taken by the PES for the period 2022 and 2023.

In this issue, an update of the PES Distinguished Lecture on SMART Power Flow Controllers is presented. The lecture was delivered by Dr. Kalyan Sen and organized by the IEEE Pittsburgh PES/IAS Joint Chapters. Next, an update from the PES University is presented where members will know about the process of getting access to PES Webinars, live or recorded mode.

We received an update of the PES STEP 2021 event organized by Stamford University SB along with its WIE AG. PES UFCG SB chapter provided an update on their initiative towards effective utilization of online platforms for publicizing chapter activities. PES NEDUET SB Chapter organized seminars on national productivity and higher education.

PES Enews is happy to share exciting technical updates reported briefly by our members. In the newly introduced Technical Brief Section of this issue, a globally optimal solution to the AC optimal power flow problem is presented by Dr. Amro M. Farid. He is currently a Visiting Associate Professor of Mechanical Engineering at MIT and an Associate Professor at the Thayer School of Engineering,
Dartmouth College. PES/IAS joint SB Chapter of Amrita School of Engineering, Bengaluru, India reported their recent major activities, such as Industrial Tour, Tech-talks, and alumni meetings. PES University of Manchester SB Chapter reported about their AGM and the 2nd Virtual Pub Quiz Competition on Power and Energy topics. PES University of Moratuwa SB Chapter provided an update on a very successful event: IEEE for the Countryside (GAMMEDDATA IEEE API)- Phase 3.

PES Humanitarian Activity Committee (PES-HAC) provided an update on the 2022 Humanitarian Technology Project Design Competition (HTPDC) to be held in May. The registration and training sessions have been started.

On Jan 4, 2022, we lost Dr. Akihiro Ametani, FIEEE, a Professor Emeritus of Doshisha University, Kyoto, Japan. An article in memoriam of Prof Ametani is included in this issue.

PES Enews is transforming into a more dynamic model:

❖ PES members will receive updates via dedicated social media channels.
❖ Articles will also be available on the eNews website.
❖ The quarterly pdf version of the eNews will also be available.

I humbly request PES volunteers to submit articles in PES Enews containing a comprehensive description with relevant photographs (videos/links) of PES-related activities/events/webinars/initiatives/achievements.

I wish you a safe life during this global crisis.

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IEEE Pittsburgh PES/IAS Joint Chapters Organized PES Distinguished Lecture Delivered by Dr. Kalyan Sen

Power flow control techniques have been practiced, from using inductors, capacitors, transformers and load tap changers in the earlier days of electrical engineering to power electronics-based solutions in recent years. Even though the costs and complexities of the available solutions vary widely, the basic underlying theory of power flow control is still the same as it always has been. The question is which solution one should employ. The answer depends on knowing what the true need is. The power industry’s pressing need for the most economical ways to transfer bulk power along a desired path may be met by building new transmission lines, which is a long and costly process. Alternately, it may be quicker and cheaper to utilize the existing transmission lines more efficiently. The key is to identify the underutilized transmission lines and harness their dormant capacity to increase the power flows to the lines’ thermal limits.

The audience heard from an expert who actually designed and commissioned a number of power electronics-based FACTS controllers since their inception in the 1990s. The presentation was designed to provide the basic principles of power flow control theory, an overview of the most commonly used power flow controllers, and future trends. His presentation was an overview of his book, titled, Power Flow Control Solutions for a Modern Grid using SMART Power Flow Controllers (ISBN: 9781119824350), IEEE Press and John Wiley & Sons, Inc., 2021. This event was co-hosted by IEEE Pittsburgh Section PELS, IEEE Boston PELS, IEEE Long Island PELS, Atlanta PELS, Charlotte PELS/IAS/IE, Milwaukee PELS, Central Indiana PELS/IAS/PES, and Seattle PELS chapters.

Brief Biography of the Speaker:

Dr. Kalyan Sen is the President & Chief Technology Officer of Sen Engineering Solutions, Inc. ([www.sentransformer.com](http://www.sentransformer.com)) that specializes in developing SMART power flow controllers—a functional requirements-based and cost-effective solution. Prior to his current role, Kalyan worked 33 years in academia and industry. He was a key member of the Flexible Alternating Current Transmission Systems (FACTS) development team at the Westinghouse Science & Technology Center for which he became a Westinghouse Fellow Engineer. He contributed to concept development, simulation, design, and commissioning of FACTS projects at Westinghouse. He conceived some of the basic concepts in power flow control technology for which he was elevated to the IEEE Fellow grade with the citation: for the development and application of...
power flow control technology. He is the co-inventor of the Sen Transformer.

Kalyan received BEE (first class honors, 1982), MSEE (1983), and PhD (1987) degrees, all in Electrical Engineering, from Jadavpur University (India), Tuskegee University (USA), and Worcester Polytechnic Institute (USA), respectively. He also received an MBA (2012) from Robert Morris University (USA). He is a licensed Professional Engineer in Pennsylvania and New York.

Kalyan has authored or coauthored more than 25 peer-reviewed publications, 8 issued patents, 2 books, and 3 book chapters in the areas of power flow control and power electronics. He is the Coauthor of the book titled, Introduction to FACTS Controllers: Theory, Modeling, and Applications, IEEE Press and John Wiley & Sons, Inc., 2009, which is also published in Chinese and Indian paperback editions.

Kalyan has served many organizations. He has been serving as an IEEE PES Distinguished Lecturer since 2002. He is an AdCom Member of the Power Electronics Society (PELS) and serves as the PELS Regions 1-6 Chair. He is the IEEE Division II Representative to the Board of Governors of Society on Social Implications of Technology (SSIT) and serves as the Chapters Committee Chair. His duties include managing 40 professional and student chapters of SSIT worldwide. He also serves as the Chair of the IEEE Pittsburgh SSIT Chapter. In these capacities, he has given presentations on power flow control technology more than 150 times in 15 countries.

In 2003, he reestablished the Pittsburgh Chapters of the PES and the IAS. Both Chapters received the “Outstanding Large Chapter” awards for their activities in 2004. He served as the Founding Chair of the IEEE Pittsburgh PELS Chapter that received the Best Chapter Award in 2015. Under his Chairmanship, the IEEE Pittsburgh Section received the “Outstanding Large Section” award for its activities in 2005. He has served as the Special Events Chair of the IEEE Pittsburgh Section for a decade. He received the IEEE Pittsburgh Section Outstanding Volunteer Service Award and PES Outstanding Engineer Award (2004). His other past positions included Editor of the IEEE Transactions on Power Delivery (2002 – 2007), Technical Program Chair of the 2008 PES General Meeting in Pittsburgh, Chapters, and Sections Activities Track Chair of the 2008 IEEE Sections Congress in Quebec City, Canada, PES R2 Representative (2010 and 2011) and Member of the IEEE Center for Leadership Excellence (CLE) Committee (2013, 2014). He is an inaugural class (2013) graduate of the IEEE CLE Volunteer Leadership Training (VOLT) program. He is a Distinguished Toastmaster (DTM) who led District 13 of Toastmasters International (TI) as its Governor to be the 10th-ranking District in the world in 2007-8. He has been serving as a Boy Scouts of America Leader for almost a decade. For more details, click on http://ieee-pes.org/images/files/pdf/chapters/archive/April2009_Chapters_Sen_PES_Volunteer.pdf.

Westmore Bowman
IEEE Pittsburgh PES/IAS Joint Chapters Chair
PES University Updates: PES Live Webinars

*PES Live Webinars are free and members can also access the recorded videos/presentation slides.*

PES University offers members life-long learning opportunities. Among the various products, PES Live Webinar events are free to the public. Members can also access the recorded videos and download presentation slides. Currently, the PES Live Webinar events are held on every 1st Wednesday and 3rd Wednesday at 11 am North American Eastern time zone.

In the past months, many speakers have contributed PES Live Webinars, including:

- Prof. Jonas Kristiansen Nøland of Norwegiann University of Science and Technology (NTNU) - on hydrogen airplane, April 2021
- Dr. Deepak Ramasubramanian of the Electric Power Research Institute (EPRI) - on simulation of a 100% IBR-penetrated network and the insights, June 2021
- Dr. Antonio Ginart of Virgin Hyperloop - on residential nanogrids for EV charging, August 2021
- Prof. Mohammad Shahidehpour, Dr. Xuan Wu, Prof. Antonio J. Conejo, Prof. Lina Bertling Tjernberg, Mr. Hamza Shafique, Prof. Zhaoyu Wang, Mr. Yuxuan Yuan - on Sep. 2021 issue of IEEE Electrification Magazine
- Prof. Wilsun Xu of University of Alberta - on synchronized measurement devices, Oct. 20, 2021
- Prof. Andy Sun of Massachusetts Institute of Technology (MIT) - on robust optimization, Nov. 3 2021
- Prof. Xiao-Ping Zhang of University of Birmingham UK - on wind farm frequency support provision, Nov. 17 2021
- Prof. Jun Liang of Cardiff University UK - on dc technology reliability, Dec. 15, 2021
- Prof. Junbo Zhao of University of Connecticut - on distribution state estimation, Jan 16, 2022
- Dr. Feng Qiu of Argonne National Laboratory - on decomposition techniques used in optimization, Feb. 2, 2022
- Prof. Hao Zhu of University of Texas Austin - on using graph neural networks to predict real-time electricity prices, Feb. 16, 2022
The archived videos and presentation slides can be accessed at PES Resource Center. [https://resourcecenter.ieee-pes.org/](https://resourcecenter.ieee-pes.org/)

If you are interested in contributing a webinar, please follow the instruction on this website [https://www.ieee-pes.org/professional-development/pes-university/pes-university-presenter-resources](https://www.ieee-pes.org/professional-development/pes-university/pes-university-presenter-resources)

*Lingling Fan*

IEEE PES University Contents Acquisition and Curation Committee Chair
PES STEP (Student Transition and Elevation Partnership) 2021 Event was Held at Stamford University

A professional development workshop was held at Stamford University with the support from PES CSAC and PES STEP.

As the part of IEEE PES STEP 2021 events, IEEE Stamford University Student Branch (SB) along with its WIE Affinity Group successfully hosted a professional development workshop (virtually) titled “Workshop on CV Writing, Motivation and Recommendation Letter Writing” on December 21, 2021 at 7:30 PM (GMT +6). The event was supported by IEEE PES Chapters Student Activities Committee (CSAC) and IEEE PES Student Transition and Elevation Partnership (STEP). Mr. Walid Bin Habib, a Research Assistant at Friedrich-Alexander-University (FAU), Germany and a dedicated IEEE PES volunteer, served as the workshop instructor.

Workshop on CV Writing, Motivation & Recommendation Letter Writing

Instructor
Walid Bin Habib

Hilfskraft Wissenschaftler, i-MEET, FAU Erlangen Nürnberg, Germany
M.Sc. INATECH. University of Freiburg, Germany; B.Sc; IEEE, University of Dhaka, Bangladesh
Chair, IEEE Germany Section SAC; Chair, IEEE PES MAC SAC
Corresponding Member, IEEE R8 MAC & IEEE R8 SIGHT

21 December, 2021 (Tuesday)
07:30 PM-09:00 PM (BD Standard Time)
Platform: Google Meet

The workshop moderator, K.M. Samiul Islam (IEEE PES CSAC Ambassador – PES STEP), first welcomed the guests, participants, and instructor. The workshop session was then taken over by Mr. Walid Bin Habib, the workshop instructor. Mr. Walid began by discussing the importance and necessity of a CV and then conducted a quick survey of participants’ career plans and higher education plans via the Google Meet chat box. He divided the workshop session into three sections. The first part focused on CV writing, the second on Letter of Motivation/SOP, and the third on Letter of Recommendation. He had elaborately narrated and instructed on these three topics, which are extremely important and beneficial to the career development of an undergraduate/graduate student.
At last there was a very interactive Q/A session. More than 200 enthusiasts had registered for the workshop session, and more than 115 individual participants had attended. The instructor had assigned a task via email and later the participants who completed the task received feedback and e-certificates of participation.

**Essential Link:**
[https://facebook.com/events/s/workshop-on-cv-writing-motivat/234513292130279/](https://facebook.com/events/s/workshop-on-cv-writing-motivat/234513292130279/)

**K.M. Samiul Islam**
Chairperson, IEEE Stamford University Bangladesh Student Branch
PES UFCG SB Chapter Took Initiatives for the Effective Use of Online Platforms to Publicize Chapter Activities

*PES UFCG SB Chapter is now effectively utilizing online social media and Youtube channel for publicizing chapter activities*

**Enhancing Online Social Interactions:**

According to the book "On the Division of Social Work", written by the sociologist Émile Durkheim, the division of tasks became a source of social relationship and interaction, in addition, it increased the efficiency and speed of production. Studies carried out by the International Stress Management Association (ISMA), carried out in nine countries, showed that Brazilian workers are among the most stressed in the world in terms of burnout. Based on these data, the IEEE PES UFCG Student Chapter created a team for the Chapter Marketing Coordination in November 2021, aiming to reduce professional stress, social harmony derived from the division of labor and increase the quality and production of the Chapter's disclosures. The team consists of a coordinator and three members: Designer, Analyst and Editor. The activity of the first call, “Conheça o PESsoal”, started on February 1st of this year, lasted 15 days, and posts were made in stories during these 15 days. Each one posted the art of a person from the PES UFCG group with a question box, where followers could ask questions about the life of this exclusive. Based on the data estimated by the social Instagram, this activity had a positive return of approximately 1.405% in comparison to that achieved in the month of January.

Therefore, in addition to this activity, there are the PES Curiosities, PES Indication, Women in Power (WIP) boxes, among other publications - always aiming at the visual identity of the Chapter - that are strategically planned to improve: the interaction, in a humanitarian way, with followers, reaching more people and social network engagement.

Reference:

Interaction data with the “Conheça PESSonal” activity on Instagram.

Publicizing Activities through Youtube Channel

With the current situation in which the world finds itself, the PES UFCG SB Chapter carried out analyses on which communication platform the public prefers to participate in the activities. When comparing the number of participants in Webinars held on Google Meet and the number of views on Youtube, it is noticeable that people opt for open events. According to the ComScore VideoMetrix survey, around 105 million Brazilians started accessing YouTube monthly, increasing usage time by 91% during the pandemic crisis. Through this, the YouTube channel became a strategic alternative for the dissemination of SB Chapter's content through the use of the StreamYard platform. The streaming tool directly transmits to Youtube and brings with it means that facilitate the audience's interaction with the speaker; it was noted that the participants felt more comfortable making observations, suggestions, and questions through the YouTube chat, without the need to speak “live” with the speaker. In addition, as the activity will be stored on the platform, people who were unable to watch the broadcast can watch it at another time that is convenient for them.
In February, PES UFCG brought two Webinars entitled: “How I used LinkedIn to gain market visibility” and “The EPE and the challenges of broadcasting in the PDE 2031”. Respectively, the first was taught by Gilcianne Fernandes on February 22, 2022, and the second was presented by Lucas Simões de Oliveira on the 24th of the same month.

After the two Webinars were held, the increase in the number of observations in the videos and in the Chapter channel was notable. Based on the data provided by Youtube itself, the Webinar on the 22nd had a total of 81 views, while the one on the 24th had 109. This initiative to keep the channel active on Youtube shows practicality in disseminating activities, as well as enabling a greater reach of people since in the last 28 days the channel had 204 views and 483 impressions on the platform. Therefore, with a view to future perspectives, Youtube is a path that provides growth and many benefits, regardless of the moment of a pandemic, it will still be used by the IEEE PES UFCG Student Chapter.
Enhancing Online Social Interactions:

*Ana Julia Mendes Gouveia da Silva Leila Maria Simplicio Rodrigues*
IEEE PES UFCG Student Branch Chapter

Publicizing Activities through Youtube Channel:

*Breno Henrique Martins Silva Carolynne Ribeiro Carvalho*
IEEE PES UFCG Student Chapter

Reference:
PES NEDUET SB Chapter Organized Seminars on National Productivity

PES NEDUET SB Chapter organized a National Productivity Seminar in collaboration with National Productivity Organization (NPO)

“Productivity is never an accident. It is always the result of a commitment to excellence, intelligent planning, and effort.” - Paul J. Meyer. Prolificacy is an art, not everyone knows. NED University trains students in exceptional skills like this such that they outshine in their professional lives. Carrying the legacy forward, IEEE PES NEDUET collaborated with National Productivity Organization (NPO) for what is called "The First Productivity Movement of Pakistan". NPO is the sole government body undertaking Productivity with Quality Initiatives in Pakistan. It has a motive to strengthen the national capacity with the implementation of productivity concepts for sustainable socio-economic development.

In the session held on 24th February 2022, the General manager of NPO, Mr. Aftab Khan explained to students what exactly is productivity and introduced some useful techniques and tools to improve productivity. Productivity, at its most basic level, is the connection between output and input - how many materials and labor hours must be invested in a work process to obtain a specific quantity and quality of output. You must alter one aspect of the connection to boost production.
The 5S concept was explained thoroughly. 5S stands for sort, set in order, shine, standardize, and sustain, was originally implemented by manufacturing enterprises in Japan. The 5S system helps to identify and eliminate wasteful activities from the production process. Ultimately, 5S helps to increase the value of products and services for consumers. Next Kaizen approach was discussed, Kaizen is based on the philosophical belief that everything can be improved. With this approach, incremental changes add up to substantial changes over the longer term, without the need for radical innovation.

Typically, it is based on cooperation and commitment and stands in contrast to approaches that use radical or top-down changes to achieve transformation. In today’s customer-centric market, quality is an integral factor in the growth and sustainability of any business. The seven basic tools of quality, often known as 7QC tools, were introduced by Kaoru Ishikawa. These tools are structured and fundamental instruments that help businesses improve their management and production process for achieving enhanced product quality. The session aptly emphasized the importance of productivity for an organization to produce success-bearing results. The attendees found the seminar to be quite involving and informative. Certificates for participation were also distributed.
A session on scholarships available for higher education was also organized. Documents required for the Fulbright scholarship in USA were explained. The session was ended with an astounding figure of NED University Prof. Dr. Saad Ahmed Qazi, Dean of ECE department. He shared his indefatigable efforts for upbringing the aspiring engineers of Pakistan. He is one of the meritorious professors of the esteemed institution with excessive research articles and publications. He shared his ebullient experience of Ph.D. in the UK and emphasized on students to avail such opportunities. In the end, a moment of appreciation was given to both the guests.

Speakers at Higher Education Event: Dr. Krishan Lal Khatri (left) and Dr. Saad Ahmed Qazi (right)

Report on National productivity Seminar
Syeda Aiman Asim and Anas Azam
Member Marketing, IEEE PES NEDUET, Karachi, Pakistan

Report on Higher Education:
Ushna Javed, Member Marketing, IEEE PES NEDUET, Karachi, Pakistan
Shaiza Kamran, Member Marketing, IEEE PES NEDUET, Karachi, Pakistan
Technical Brief: Global Optimal Solution to AC Optimal Power Flow Problem Published

A globally optimal solution to the AC optimal power flow problem is presented that can have a profound impact on the global electricity markets.

Since its first formulation in 1962, the AC optimal power flow (ACOPF) problem has been one of the most important optimization problems in electric power systems and is amongst the first that power systems engineers experience in their education. In its most common formulation, electric power generation costs are minimized subject to network flow constraints, generator capacity constraints, line capacity constraints, and bus voltage constraints. As such, the ACOPF finds its greatest practical application in electric power systems markets where electric power is sold at the minimum cost while still securing the reliability of the electric power grid.

Unfortunately, this ACOPF formulation is a non-convex optimization problem that consequently falls into the as-yet-unsolved space of computationally complex (NP-hard) problems. Although the globally optimal solution has been elusive, the power systems field has developed a rich volume of OPF literature spanning six decades. Collectively, these works have offered numerous relaxations and approximations to the ACOPF. A dozen review articles published over that period show many hundreds of articles on the topic. The most famous approximation, the DCOPF (Direct Current Optimal Power Flow) has been at the heart of many wholesale, deregulated, “real-time” energy markets found at many independent system operators worldwide.

Such relaxations and approximations of the ACOPF result in economically suboptimal solutions that do not necessarily secure the grid. Consequently, downstream reliability procedures from control operators and automatic control systems are needed to ensure that the grid is dispatched reliably. While the potential impact on reliability can be mitigated, energy regulators have estimated that the sub-optimality costs the United States $6-19B per year. Furthermore, the sustainable energy transition necessitates renewed attention toward the ACOPF.

1. In order to support the integration of distributed generation and energy storage, electric power systems markets are expanding beyond their traditional implementation as wholesale markets in the transmission system to retail markets in the distribution system and microgrids. In North America, this would constitute a dramatic proliferation of the optimal power flow problem from the nine independent system operators to potentially thousands of electric distribution system utilities and operators.
2. The radial and large-scale nature of distribution systems necessitate scalable ACOPF algorithms.

3. **Distribution systems** feature a prominent role in line losses, nodal voltages, and reactive power flows which disqualifies many of the typical OPF approximations.

4. Fourth, the integration of variable renewable energy resources further necessitates the participation of demand-side resources in two-sided markets.

5. Finally, as the electric power grid activates these demand-side resources, it also integrates itself with the operation of other infrastructures including water, transportation, industrial production, natural gas, and heat. The non-convexity of the electric power network flow equations – as they are commonly stated – impedes the effective sector coupling of multiple infrastructure sectors.

Collectively, these reasons indicate that the ACOPF problem needs an alternative formulation and not just a new solution algorithm. Furthermore, it is of immediate importance to many grid stakeholders including transmission system operators, distribution system operators, and electric utilities. Recently in [1], a definitive solution to this once intractable problem is proposed. The heart of the solution rests upon a change of decision variables from the familiar “PQVθ” variables of active power, reactive power, voltage magnitude, and voltage phase to the “IV” variables of current and voltage phasors in rectangular coordinates.

The new reformulation transforms the grid's network flow constraints from non-convex to linear and convex. This transformation, however, is insufficient and leaves non-convexities in the objective function and the bus-voltage magnitude lower bound. To overcome these, this reformulation sheds the traditional “power flow analysis” model and instead adopts the “current-injection” model that power systems engineers use to conduct transient stability studies. This choice of the model means that generator terminal voltages and lead lines are explicitly modeled. The necessary introduction of generator terminal voltage upper bounds then provides the key to overcoming the non-convexity introduced by the bus-voltage magnitude lower bounds. Similarly, the introduction of generator lead lines combined with demand-side revenue terms in the objective function serves to transform the once non-convex objective function into a convex fourth-order polynomial. The resulting formulation is a scalable convex optimization program that can be solved to global optimality in polynomial time using a Newton-Raphson algorithm.

A globally optimal solution to the ACOPF can have a profound impact on the trajectory of electricity markets worldwide. In addition to the already significant economic efficiencies in wholesale markets, its application has even greater potential in emerging electricity markets in the distribution system. Furthermore, because it respects grid reliability constraints, it has the potential to simplify and improve control room operations. Finally, this work opens the door to significant future work that enables the sustainable energy
transition including the integration of renewable energy resources, the development of two-sided markets with elastic demand, and coupling to other infrastructure sectors.

https://ieeexplore.ieee.org/document/9663377

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Amro M. Farid (Senior Member, IEEE) received the B.Sc. degree, in 2000, the M.Sc. degree in mechanical engineering from MIT, in 2002, and the Ph.D. degree in engineering from the University of Cambridge, U.K. He is currently a Visiting Associate Professor of Mechanical Engineering at MIT, an Associate Professor in Engineering at the Thayer School of Engineering, Dartmouth College, and the CEO of Engineering Systems Analytics LLC. He leads the Laboratory for Intelligent Integrated Networks of Engineering Systems (LIINES) and has authored over 150 peer-reviewed publications in smart power grids, energy-water nexus, electrified transportation systems, industrial energy management, and interdependent smart city infrastructures. He holds leadership positions in the IEEE Smart Cities Technical Community, Control Systems Society (CSS), the Power & Energy Society (PES), and the Systems, Man & Cybernetics Society (SMCS).
Updates from PES/IAS Joint SB Chapter of Amrita School of Engineering, Bangalore

IEEE PES/IAS joint SB Chapter of Amrita School of Engineering, Bengaluru, India recently organized Industrial Visit, Tech-talks, and Alumni Meet.

Industrial Visit

An industrial visit to “NUETECH SOLAR PVT. LTD.”, Bangalore, India was organized by the Department of EEE, PES/IAS joint SB chapter, and IEEE PELS chapter. Thirty-three EEE students and three faculty members joined the event. It was a great opportunity for the participants to get hands-on experience and interact with the industry personnel to know the detailed mechanism, the design evolution, current market evolutions, and the latest most demanding technologies. The visit ended with a great field experience.

Students at the NUETECH SOLAR Pvt Ltd. At Industrial Tour

Tech-talk Series

A Tech-talk series was organized virtually in March consisting of 6 talks:

- Techniques of Business Analysis in Software Engineering
  Ms. Anusha Kumar
  Techno Functional Analyst
  Data-driven Finance Risk and Compliance Team, Capgemini, India

- The importance on Data Analytics in companies
  Mr. Sujith Achuthan
  Senior Business Intelligence Engineer, Amazon EU
- Cyber Security for Engineers
  Mr Sachin S Kamath
  Offensive Security Lead, Axiata Group

- Business analytics and business intelligence for beginners
  Ms Sharmiela Selvaraj
  Analytics Consultant- Business Intelligence

- Introduction to building distributed systems in the cloud
  Ms Lekshmi Unnikrishnan
  Senior Software Engineer, Amazon Web Services, Seattle, USA

- Introduction to Data Analysis using R
  Ms Aarathy Babu
  Infectious Disease Modeller, Telethon Kids Institute, Perth, Australia

This Tech-talk series provided a better understanding to the participants on the trending business analysis, data analytics, and cybersecurity in all the different fields of engineering. These events helped the participants to grab handsome knowledge to excel in their fields and to envision inter-disciplinary works in various fields of engineering.
Group photo with Ms Anusha Kumar as a part of the Tech talk

Women’s Day Celebration

As a part of Women’s Day celebration three events were organized with renowned female speakers from Alumni, Academia, and a Fireside Chat with Industry Directors was also arranged. The Alumni talk was in offline mode on “Industrial Expectation” by Ms Akshitha Akasapu (Developer, TCS). The Undergraduate participants took many takeaways that could indeed help them with their placements. In collaboration with IEEE PELS Bangalore Chapter, IEEE IES Bangalore Chapter and IEEE WIE Bangalore Section, a talk on “Modern Power Distribution” by Dr M. Venkata Kirthiga (Assistant Professor, NIT-Tiruchirappalli) was organized.

The Fireside Chat was organized in collaboration with IEEE WIE Bangalore Section. The gathered members and the students began the day with a Women’s Day celebration and cake cutting, casual discussion, and snacks. The formal event commenced with Dr. Kumudhini Ravindra, Chair WIE Bangalore Section sharing a few words on the women
in the industry and their journey and inviting the speakers and the moderator for the fireside chat, Ms Parvathi Rachakonda, Manager at IBM. The discussion continued with the speakers Rajeshwari Sundaranjan, Senior Director, Epsilon and Jyothy Shetty, Engineering Director Microfocus sharing their perspective of the industry required skills needed to be imbibed by the new technology graduates. It was an interactive session where many students interacted with the speakers and discussed their careers.

The PES/IAS joint SB Chapter of Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Bangalore, India would like to thank all the speakers and the wonderful participants for making these virtual and offline events a grand success and looks forward to organizing more events in future.

**Reddi Vivek Vardhan**  
Vice-Chairperson, PES/IAS joint SB Chapter, ASEB
University of Manchester PES SB Chapter: Quiz Competition and AGM

*PES SB Chapter at the University of Manchester (UoM)* organized the AGM and the 2\textsuperscript{nd} Virtual Pub Quiz Competition on Power and Energy topics.

PES SB Chapter at the University of Manchester (UoM) hosted the 2\textsuperscript{nd} Virtual Pub Quiz competition on power and energy topics. This social activity was organized to promote knowledge of IEEE, IEEE PES, and the latest development in the power and energy space among university students all over the world. This event attracted 20 registrations and was hosted via the Zoom online meeting platform on 31\textsuperscript{st} March 2022.

**Event Flyer**

Mr. Omoniyi Akinpelumi, the Chair of the PES SB Chapter, made a welcome opening remark and thereafter gave a brief talk on the vision and mission of the SB chapter. He also explained some of the importance and benefits of IEEE and IEEE PES opportunities to university students. The power and energy quiz session took place thereafter with a total of 40 questions contended, ranging from IEEE development-related questions to foundational electrical engineering questions. The Kahoot online application software was used as the quiz platform and hence was used to capture both the correctness and timeliness of answers in ensuring fair competition for the prize awards, thus attendees were all fully focused and excited.

**Podium of top three quiz winners**
The quiz winners were awarded cash prizes. This event received positive feedback from attendees, with comments buzz words including “well-designed”, “fun”, and “informative”. The PES SBC at UoM would like to thank all the attendees for their participation and we hope to continue this kind of activity next year.

PES UoM SB Chapter’s Annual General Meeting (AGM) was held on 11th Feb 2022. A detailed review of events organized by the outgoing committee was presented and a democratic election for the different roles was conducted. Mr. Keyi Wang who is the outgoing Chair highlighted the many successes recorded within his tenure ranging from the organization of periodical virtual pub-quiz shows, the increase in the SBC’s social media followings and more importantly, the successful virtual hosting of a site visit to Drax Power Station and the MEEPS conference. Based on these excellent achievements, the SBC was awarded the best IEEE PES SBC for IEEE Region 8 in the special category awards. As regards the elections, Omoniyi Akinpelumi, who served as the vice-chair for the outgoing committee, was elected as the new chair of the SBC committee. Details of the other new committee members are listed below.
2022 PES UoM SB Chapter Committee:
Information on new SB Chapter committee members as seen below have their photos arranged above, from top left to bottom right.

Chair: Omoniyi Akinpelumi,
Vice-Chair: Wenzhu Liu
Secretary: Omer Elmogamer
Treasurer/Event Coordinator: Airam Perez Guillen
Industrial Liaison Officer: Christian Nwosu
Social Media/Events & Publicity Officer: Xinyun Liu
Web Coordinator: Shuai Wang

For more information on the PES UoM SB Chapter, visit: http://www.ieee-manchester.org.uk/

Omoniyi Akinpelumi
PES SB Chapter at the University of Manchester
PES University of Moratuwa SB Chapter: Updates on IEEE For the Countryside (GAMMEDDATA IEEE API)- Phase 3

A webinar series on technology-based topics to lend a helping hand to the technology enthusiastic school-going children around Sri Lanka

The project “Gammeddata IEEE Api” is an initiative of the IEEE PES SB Chapter of the University of Moratuwa and is organized in collaboration with the Industry Applications Society (IAS), Robotics and Automation Society (RAS), Industrial Electronics Society (IES) Student Branch Chapters and the IEEE Student Branch of the University of Moratuwa. The main objective of this project is to lend a helping hand to the enthusiastic school children who live in Sri Lanka to have exposure to trending technology-related topics. For the year 2022, the project has been organized as “Gammeddata IEEE Api - phase 3” with its proud and awarded history of Darrel Chong Student Activity Award, Silver Category for phase 1 and Gold for phase 2.
The “Gammeddata IEEE Api - phase 3” launched as a webinar series conducted for four days on various technology-related topics that are trending in the world including Python programming language, Sensors and actuators, DIY projects. As the event had to be conducted during the pandemic, it had been conducted as a virtual event via Zoom during 26-27 March and 2-3 April 2022 from 2.30 PM to 9.30 PM. The experienced young professionals and undergraduates had enlightened the sessions. The sessions were conducted in both Sinhala and Tamil languages to overcome the language barriers as the students had participated around Sri Lanka. Around 70+ volunteers had joined in volunteering to pave the path to the success of this project and around 6000+ registrations for the sessions had proven that phase 3 had reached higher success in this “Gammeddata IEEE Api” journey.

Screenshots during the event

Finally, it can be concluded that the great effort put into action by identifying the necessity to encourage and support those future engineers had added new value and knowledge to their lives to carry out their endeavors and the future of technical industries of our country.

Dinithi Senarath
Secretary, PES SB Chapter, University of Moratuwa.
The second edition of the Humanitarian Technology Project Design Competition (HTPDC) is launched by the PES Humanitarian Activity Committee (PES-HAC).

After a huge success in 2021, PES Humanitarian Activity Committee (PES-HAC) has launched the second edition of the Humanitarian Technology Project Design Competition (HTPDC) during the PES Day 2021. The registration process has been started and a good number of teams have already registered. Due to ongoing University Examinations, there were several requests from interested participants to extend the registration deadline. The HTPDC Organizing Committee is pleased to extend the registration date until 5th May 2022. The registration link is available here.

In the HTPDC 2021 there were 65 teams (19 Sections/12 Countries) registered during that event. The local round events were held in six different locations across the globe. Experts from seven different countries judged the competition. A total of $1000 was awarded to the winners of the event.

The HTPDC is not just a project design competition, it offers:

1. Online Training Sessions on Humanitarian Technology Project Design
2. Live Virtual Discussion Forum
3. Live Virtual and Online Feedback on Project Design
4. Local and Final Rounds of Competition based on video presentation and virtual Q/A.
The details are available on the website; however, few key points are mentioned here:

- HTPDC is an idea sharing competition with the major components such as objective, challenges, humanitarian aspects, technical details, feasibility of the project, sustainability, etc. There is no working model/prototype mandatory.

- A team of 3 – 10 members (mostly students) is preferred where the team lead must be an IEEE and PES member along with the overall PES membership of 30% members. (For example, if a team of 3 members formed, the team lead being the IEEE and PES member satisfies both the conditions)

- Based on the submitted video, document, and online presentation, winners in the local round and final round will be selected. Only selected winners in the local round will be given the opportunity to present in the final round.

- Prize money amounting $ 1500 to be awarded. (Winner - $ 500, Runners up - $ 400, Honourable Mentions (3 nos.) - $ 200 each)

- Depending on the project quality, some selected projects will be invited to submit a detailed project proposal for IEEE PES-HAC Project Funding after the final round of competition. (detailed instruction will be provided later)

Training Sessions

PES-HAC in association with several OUs have organized several interactive training sessions where the participants were briefed about the competition HTPDC. The PES-HAC Chair, Vice-Chair, Secretary and some of the Working Group Chairs of PES-HAC conduct the training.
Contact for Queries:

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Tanmoy Roy Choudhury, Ph. D., C. Eng.,
SMIEEE Secretary, PES-HAC
Asst Prof, School of EE, KIIT Deemed to be University
In Memoriam Akihiro Ametani (1944-2022)

Dr. Akihiro Ametani, FIEEE, a Professor Emeritus of Doshisha University, Kyoto, Japan, passed away on January 4, 2022.

Dr. Akihiro Ametani, a Professor Emeritus of Doshisha University, Kyoto, Japan, passed away on January 4, 2022. He was elevated to the IEEE Fellow status in 1992 “for contributions to the analysis of electrical transients in power systems” and became a Life Fellow in 2009. He made notable achievements in the field of power engineering. In particular, his distinguished achievements are the development of computational models including the frequency-dependent line model for electromagnetic transients (EMT) analysis and the development of line/cable constant calculation programs represented by the "CABLE CONSTANTS" of Electro-Magnetic Transients Program developed by the Bonneville Power Administration (BPA-EMTP, Portland, Oregon, USA) and "CABLE CONSTANTS/CABLE PARAMETERS" of Alternative Transients Program (ATP). He had greatly contributed to the development of the power engineering community.

Professor Ametani received the B.Sc. and M.Sc. degrees from Doshisha University, Kyoto, Japan in 1966 and 1968 respectively, and the Ph.D. degree from the University of Manchester Institute of Science and Technology (UMIST) (present the University of Manchester), the U.K. in 1973. He became an Assistant Professor at Doshisha University in 1968 and started his career as an academic. From 1971, he was engaged in research on power system transients at the UMIST as a research assistant and a Ph.D. student of the late Professor Martin Wedepohl. From 1976 through 1982 and in 1987 and 1988, he was engaged in the development of EMTP at the BPA. Professor Ametani became an Associate Professor in 1976 and then a Full Professor in 1985 at Doshisha University, and a Professor Emeritus of Doshisha University in 2014. He served as a Visiting Professor for Ecole Polytechnique of Montreal, Canada from 2014 through 2018, and for the University of Manitoba, Canada from 2019.
Professor Ametani had the Fellow statuses of the Institution of Engineering and Technology (IET) and the Institute of Electrical Engineers of Japan (IEEJ). He was a Distinguished Member of the Conseil International des Grands Reseaux Electriques (CIGRE, International Council on Large Electric Systems). In 2010, Professor Ametani was awarded the D.Sc. degree from the University of Manchester in recognition of his contribution to the field of power system transients. He was also deeply involved in the International Conference on Power System Transients (IPST) and served as the co-chairman for the Steering Committee of the IPST. He greatly contributed to the management of International Universities Power Engineering Conference (UPEC).

He authored or co-authored more than 150 international journal papers including IEEE and IEE (present IET) transaction papers. He published about 20 textbooks. Of them, “Cable System Transients – Theory, Modeling and Simulation (IEEE Press, Wiley, 2015) and “Electromagnetic Transients in Large HV Cable Networks (IET, 2021)” are truly appreciated in the world as standard guides for EMT analysis of cable systems and textbooks for engineers and researchers in the field of electrical engineering.

Professor Ametani was strongly dedicated to education, research and development, and other activities throughout his lifetime. His contributions to the IEEE PES continue to be sincerely appreciated. His absence will be keenly felt by the IEEE PES community for years to come.

May his soul rest in peace.

_Naoto Nagaoka_
Professor, Doshisha University, JAPAN

_Shozo Sekioka_
Professor, Shonan Institute of Technology, JAPAN

_Hideki Motoyama_
Associate Vice President, CRIEPI, JAPAN