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IEEE STPEC 2023

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2023 IEEE 3rd International Conference
Smart Technologies for Power, Energy and Control (STPEC)

CONFERENCE DIGEST

10th – 13th December, 2023

Organized by

KiiT

School of Electrical Engineering
Kalinga Institute of Industrial Technology (KIIT)
DEEMED TO BE UNIVERSITY
BHUBANESWAR - 751024, ODISHA

KIIT at a Glance

Kalinga Institute of Industrial Technology (KIIT), a household name in the education sector, has become a sought-after destination in India for professional studies. It is admired all over for the quality of its academic courses, its community outreach work and as a university of compassion and humanitarianism. It has become a case study because no other educational institution in India has grown in its scope and scale as much as KIIT has in a short span of 25 years. Its incredible transformation is truly a journey from Soil to Silver. KIIT started in 1992-93 as an Industrial Training Institution. However, 1997 is considered the base year for the University as undergraduate and postgraduate courses in Engineering, Management and Computer Applications were added. In 2007, many new schools were added to its umbrella - School of Law, Biotechnology, Medical Sciences, Dental Sciences, Nursing, Mass Communication, Film and Media, Fashion and KIIT International School. Since then, there has been no looking back! Today, KIIT offers professional education to around 40,000 students from across India. This includes 2000 international students from 65 countries. The alumni of KIIT, over a lakh of them, have made their mark in their respective careers in academics, corporate organisations, civil services and enterprise.

One would find it difficult to imagine that such a celebrated institution with a global reputation was established by an unassuming humble being, Dr Achyuta Samanta, the Founder of KIIT and KISS, who started the institute with all of Rs 5000 as the initial investment. He had big dreams and a passion to make a difference. Dr Samanta started KIIT in two rented rooms with 12 students and 2 staff. The modest institution has now grown to incomprehensible propositions and is spread over a vast 36-square-kilometre academic township. Its 30 lush green campuses employ over 3000 eminent faculty and researchers and 15000 staff. KIIT and KISS together is a family

of over a lakh people. The campus houses a 2600-bedded super speciality hospital, KIMS, a multi-storey central library, a central research facility, a 22-storey research and innovation wing, auditoriums - the largest one with 5000 seating capacity, 18 sports complexes, many international standard stadiums covering all sports, 30 food courts, and a rose garden. The institution takes pride in being the greenest campus in India.

It has received all accreditations and affiliations from prestigious national and international bodies such as the Accreditation Board for Engineering and Technology (ABET), USA and the Institution of Engineering and Technology, (IET), UK because of its quality research, innovation, and publications and citations. KIIT has had an excellent placement record since its inception owing to its quality teaching and learning process, and the brand value that it carries. KIIT is ranked in the cohort of 601-800 in the Times Higher Education 'World University Ranking' for 2024 and declared as the sixth best university in India, among Government and Private. Its Computer Science Engineering ranks in the cohort of 301-400 and its overall Engineering ranking is 401-500 in the world. KIIT has been accredited with an A++ grade by the National Assessment and Accreditation Council (NAAC) with an all-India 16th rank by the National Institution of Ranking Framework, NIRF, Ministry of Education. It has also been the top university for innovation among private institutions for two consecutive years (2020, 2021) according to AICTE, Government of India. It has been ranked among the top 151-200 universities in the world as per the Times Higher Education Young University Ranking 2022.

KIIT has made colossal contributions to Sports. Currently, 12 Olympians pursue their education at KIIT. The University has been conferred the Sportstar Award and FICCI India Sports Award for the promotion of sports. KIIT and KISS are the nodal centres for the FIFA Football For Schools Programme in Asia. KIIT has been chosen for the Rashtriya Khel Protsahan

Puruskar 2022 for encouraging sports through Corporate Social Responsibility. Four students of KIIT have bagged 2 Gold medals and 2 Silver Medals at Asian Games 2022 in China. Besides its immense contribution to the development of the state and the city, KIIT has also promoted local art, culture, sculpture, rural development, literature and spiritualism. All the achievements of KIIT have been possible because of its founder - Dr Achyuta Samanta - lovingly called Samanta Sir - the epitome of principles, discipline, hard work, and selfless service. It truly is an inspiring story of a humble man steering two institutions to glory despite all the hardships and struggles.

KIIT School of Electrical Engineering

The School of Electrical Engineering has been playing a vital role in producing engineers and scientists of high caliber since its inception in 1997. At present, it offers Undergraduate, Postgraduate and Ph.D. programs in Electrical Engineering to cater to the ever-challenging needs of technical excellence in all areas of Electrical Engineering such as Power Electronics and Drives, Power & Energy System and Power System Engineering. The School is having a vibrant atmosphere due to the combination of input of brilliant students, availability of outstanding faculty members and innovative research work in all areas of Electrical Engineering. The School has state-of-the-art laboratories and all necessary facilities to enhance the quality of the teaching-learning process. The course structure is constantly reviewed to meet the ever-changing requirements of the volatile industrial market, keeping the essence of the core Electrical Engineering intact. The academic and research activities in the School focus on the frontier areas of electrical engineering such as power quality studies, distributed generation, soft switching of converters, inverter design, control strategies for complex systems, and renewable energy. Placement offers to the students have always shown an ever-increasing trend and promise to be the best in the future with the incoming boom of the Power sector. School has made MoUs with National Instruments, Schneider Electric, Siemens

Ltd and with other Industries in the domain of Smart Grid, Energy Efficient Electrical Motor Drives. School has been accredited by IET (UK), NAAC, NBA (Washington Accord) Tier-I, UGC (Institute of Eminence), QS (World University Ranking), NIRF, 301+ The Times Higher Education World University Ranking.

About IEEE STPEC 2023

The 3rd IEEE International Conference on Smart Technologies for Power, Energy and Control (STPEC) 2023 is being organized by the School of Electrical Engineering, KIIT Deemed to be University, Bhubaneswar, India during 10th to 13th December, 2023. The conference is financially sponsored by IEEE Industry Applications Society (IAS) and IEEE Power Electronics Society (PELS) & Technically Sponsored by IEEE Industrial Electronics Society (IES) and IEEE IES Bhubaneswar Subsection Kollkata Joint Chapter. The 1st IEEE International Conference on Smart Technologies for Power, Energy and Control (STPEC) 2020 was held at Visvesvaraya National Institute of Technology, Nagpur, India in the year 2020 and the 2nd IEEE STPEC was held at CEC Bilaspur, C.G., India in 2021. The objective of the conference is to provide a platform for electrical engineers and researchers to present their research work and to share experiences and ideas in the area of power, energy, control and related engineering applications. The conference includes plenary sessions, keynote speeches and technical paper presentations.

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KEYNOTE SPEAKERS

Brij N. Singh
John Deere,USA

Dr. Brij N. Singh has earned BE from Madan Mohan Malviya Technical University, Gorakhpur, ME from Indian Institute of Technology Roorkee, and Ph.D. from Indian Institute of Technology, New Delhi, India, all in Electrical Engineering. In 1996, Dr. Singh joined the École de Technology Supérieure, Montreal, Canada, as a Post-Doctoral Fellow. In 1999, he joined Concordia University, Montreal as a Research Fellow. In 2000, he joined the Department of Electrical Engineering and Computer Science, Tulane University, New Orleans, Louisiana, as an Assistant Professor. In 2007, Dr. Singh has joined John Deere as a Staff Engineer to lead and support silicon IGBT inverter development projects for the JD 644K and JD 944K Hybrid Loaders. In 2011, he joined Advanced Technology as a Senior Staff Engineer to lead John Deere's WBG power electronics projects. In 2020, Dr. Singh was named as the Region 4 Manager External Relationships with responsibilities to develop emerging technologies to support technology needs for the John Deere Tech Stack, Production Systems, Product Lifecycle Systems, Construction, Road Building. Dr. Singh has published over 90 research articles including papers in the IEEE Transactions and IET Journals. He has 28 approved US patents, one trade secret, and over a dozen pending patents.

In Tulane, Dr. Singh received four IEEE-Eta-Kappa-Nu teaching awards for outstanding instructions in electrical engineering. In John Deere, he has received three innovation and one collaboration awards for product and technology development projects. Dr. Singh is the winner of the 2020 IEEE

Power Electronics Emerging Technology Award for "In-Vehicle Demonstration of Engine-Cooled Power-Dense Scalable SiC Inverter". In 2020, Dr. Singh was awarded the "Title of John Deere Fellow" for exemplary knowledge leadership and significant contributions to the power electronics engineering. He is an IEEE Fellow and life member of IEEE Industrial Electronics and Power Electronics Societies and lives with his family in West Fargo, ND, USA.

Akshay Kumar Rathore
Singapore Institute of Technology

Akshay Kumar Rathore is an IEEE Fellow and expert in power electronics and control of electrical motor drives. He is currently a full Professor and Program leader of Electrical Power Engineering Degree Program jointly offered with Newcastle University, UK. He received the Gold Medal for securing the highest academic standing in his Master's degree among all electrical engineering specializations at Indian Institute of Technology (BHU) Varanasi, India. He received his PhD degree in Power Electronics from University of Victoria, British Columbia, Canada in 2008. He had two subsequent postdoctoral research appointments with the University of Wuppertal, Germany, and the University of Illinois at Chicago, USA. From November 2010 to February 2016, he served as an Assistant Professor at the Department of Electrical and Computer Engineering, National University of Singapore. From March 2016-Dec 2021, he served as an Associate Professor at the Department of Electrical and Computer Engineering, Concordia University, Montreal, Canada where he was listed in the Provost Circle of Distinction in 2021. He served as Graduate Program Director and Chair of Graduate Awards during 2020-21.

Dr. Rathore is a recipient of the 2013 IEEE IAS Andrew W. Smith Outstanding Young Member Achievement Award, 2014 Isao Takahashi Power Electronics Award, 2017 IEEE IES David Irwin Early Career Award, 2019 IES Publications Service Recognition Award, 2020 IEEE IAS Outstanding Area Chair Award, 2020 IEEE Bimal Bose Award for Industrial Electronics Applications in Energy Systems and 2021 Nagamori Award. He published about 300 research papers in international journals and conferences, including 98 IEEE TRANSACTIONS.

His research is mainly focused on the analysis and design of novel current-fed converters (topologies and modulation), soft-switching design and modulation schemes for the dc/dc converters, pulsating DC link (electrolytic capacitorless) inverters, and control of multilevel inverters. He is currently serving as the co-Editor-in-Chief of IEEE Transactions on Industrial Electronics, Awards Department Chair of the IEEE Industry Applications Society, AdCom Member-at-Large and Fellow Evaluation Committee member of the IEEE Industrial Electronics Society. He is serving as the Chair of IEEE IAS Renewable and Sustainable Energy Conversion Systems Committee. He led and chaired the IEEE IAS Industrial Automation and Control Committee (2018-19) and IEEE IAS Technical Committee on Transportation Electrification (2016-17).

He served as the Paper Review Chair (eq. to co-Editor-in-Chief) of IEEE Transactions on Industry Applications (2016-17 and 2020-21), Editor-in-Chief of IEEE IES Technology News (ITeN) (2016-18), Associate Editor of various journals, i.e., IEEE Transactions on Industrial Electronics (2014-19), IEEE Transactions on Industry Applications (2013-present), IEEE Transactions on Transportation Electrification (2014-19), IEEE Journal of Emerging Selected Topic in Power Electronics (2013-19), IEEE Transactions on Vehicular Technology (2016-19), IEEE Transactions on Sustainable Energy (2014-2021) and IET Power Electronics (2015-19). He edited 5 special issues on the topics of electric transportation, EV charging,

marine systems, more electric aircraft, machine learning in power electronics, and renewable energy conversion in different IEEE Transactions as a guest associate editor and as guest-EIC of 2 special issues.

Ching-Jan Chen
National Taiwan University, Taipei, Taiwan

Ching-Jan Chen (S'08–M'12–SM'18) received B.S. and Ph.D. degrees in electrical engineering from National Taiwan University, Taipei, Taiwan, in 2006 and 2011, respectively. From 2010 to 2011, he was a visiting scholar at the Center of Power Electronic Systems (CPES) of Virginia Tech., Blacksburg.

In February 2015, he became an Assistant Professor at the Department of Electrical Engineering, National Taiwan University (NTU), Taiwan, where he is currently an Associate Professor.

His current research interests include control, modeling, and power IC design of dc–dc and ac-dc power converters for CPU and mobile devices, and GaN driver IC design. He is a Senior Member of the IEEE Power Electronics Society. He is the recipient of the Young Researcher Award from the Electrical Power Engineering Division, Ministry of Science and Technology (MOST), Taiwan, in 2016, the Outstanding Teaching Award from NTU in 2020, the Research Contribution Award from NTU EECS in 2020, and Ta-You Wu Memorial Award (吳大猷先生紀念獎) from MOST, Taiwan, in 2021. He is the co-recipient of 2019 IEEE Transportation Electrification Conference Asia-Pacific (ITEC-AP) Best Paper Award and 2018 International Workshop on Power Supply on Chip (PwrSoC) Best Poster Award. He served more than 16 times as session chair, topic chair, and financial chair in several IEEE conferences and competitions, such as ECCE, ECCE-Asia, International Future Energy Challenge (IFEC), IFEEC, WiPDAAsia, ITEC-Asia Pacific, and VLSI-DAT. He is an Associate Editor for the IEEE Transactions on Power Electronics. He is the Secretary and then vice-chair of the IEEE PELS Taipei Chapter from 2018 till now and received the IEEE PELS Best Chapter Award in 2018.

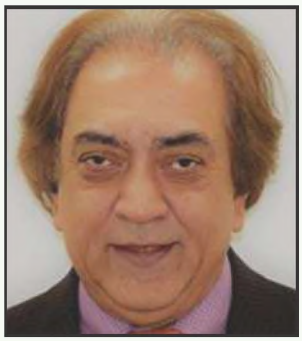
Sri Niwas Singh
ABV-Indian Institute of Information Technology and Management. Delhi

Prof S. N. Singh obtained his M. Tech. and Ph. D. in Electrical Engineering from Indian Institute of Technology Kanpur, in 1989 and 1995. Presently, Prof Singh is Director, Atal Bihari Bajpayee- Indian Institute of Information Technology and Management Gwalior (MP), India (on leave from Professor (HAG), Department of Electrical Engineering, Indian Institute of Technology Kanpur, India). Before joining IIT Kanpur as Associate Professor, Dr Singh worked with UP State Electricity Board as Assistant Engineer from 1988 to 1996, with Roorkee University (now IIT Roorkee) as Assistant Professor from 1996 to 2000 and with Asian Institute of Technology, Bangkok, Thailand as Assistant Professor from 2001 to 2002. He was Vice- Chancellor of Madan Mohan Malviya University of Technology Gorakhpur during April 2017 to July 2020.

Dr Singh received several awards including Young Engineer Award 2000 of Indian National Academy of Engineering (INAE), Khosla Research Award of IIT Roorkee, and Young Engineer Award of CBIP New Delhi (India), 1996. Prof Singh is receipt of Humboldt Fellowship of Germany (2005, 2007) and Otto-monsted Fellowship of Denmark (2009-10). Prof Singh became first Asian to receive 2013 IEEE Educational Activity Board Meritorious Achievement Award in Continuing Education. He is also recipients of INAE Outstanding Teacher Award 2016 and IEEE R10 region (Asia-Pacific) Outstanding Volunteer Award 2016. Dr Singh is appointed as IEEE Distinguish Lecturer of Power & Energy Society from 2019 and Industry application Society for 2019-2021. He is also recipient of NPSC 2020 Academic Excellence Award and 2021 IEEE

Industry Application Society (IAS) Outstanding Educator/ Mentor Award. His research interests include power system restructuring, FACTS, power system optimization & control, security analysis, wind power, etc. Prof Singh has published more than 550 papers (h-index=60, Citation=14k+) in International/ national journals/conferences and supervised 41 PhD (7 PhD under progress). He has also written 31 book chapters, 8 Edited books and 2 text-books one on Electric Power Generation, Transmission and Distribution and second is Basic Electrical Engineering, published by PHI, India. Prof Singh has completed three dozen of technical projects in India and abroad. His two NPTEL (YouTube) video lectures on HVDC Transmission and Power System Operation & Control are very popular. Prof Singh was Chairman, IEEE UP Section for 2013 & 2014, IEEE R10 (Asia-Pacific) Conference & Technical Seminar Coordinator 2015-18 and R10 Vice-Chair, Technical Activities (2019-2020). Dr Singh is Fellows of IEEE (USA), IET (UK), INAE, IE(I), AAIA, IETE, AvH.

Gourab Majumdar
Mitsubishi Electric Corporation, Japan



Academic Background:Bachelor of Technology (B. Tech) degree in Electrical Engineering from Indian Institute of Technology (IIT), Delhi in 1977, Doctorate in Engineering (PhD) degree from Kyushu Institute of Technology, Japan in 2005.

Gourab Majumdar was born in India in June, 1955 and acquired Japanese nationality in October, 2018. While his name has changed to Gourab Suzuki, he continues to use Gourab Majumdar as penname. He received Bachelor of Technology degree in electrical engineering from Indian Institute of Technology (IIT), Delhi, India in 1977 and Doctor of Engineering degree from

Kyushu Institute of Technology (KIT), Japan in 2005. He came to Japan in September, 1978, and has been living in the country since then. He started his job career at Mitsubishi Electric Corporation, Japan (Mitsubishi Electric) on a special OJT program in September 1978. He was employed by the same company in 1980 and, since 1983, has worked in its units responsible for advanced power semiconductor development, designing and application. From April-2012 to March-2017, he served as Executive Fellow, Semiconductor & Device Group of Mitsubishi Electric. On April-2017, he was reemployed by

Mitsubishi Electric on a contract basis and acted as Senior Fellow (Technology) for Semiconductor & Device Group of the same company until March-2021. From April-2022 until currently, he has been working as Senior Fellow for Power Device Works of Mitsubishi Electric. He has published and co-authored many technical papers and books on power semiconductor devices and holds several patents in the related fields. He is a recipient of the prestigious National Invention Award in Japan in 2005 for invention of the fundamental concept of IPM (Intelligent Power Module) and has also received several other prestigiouscawards, including the "Monozukuri Nihon Taishou" (Japan Craftsmanship Grand Prix) awardcfrom the Ministry of Economy, Trade and Industry in 2013 for contribution in development and commercialization of various versions of IPM devices. He served as the General Chairman of ISPSD 2013 and has been participating as a member of PCIM's Advisory Board and ISPSD's Advisory Committee. He received IEEE-ISPSD Contributory Award in 2017 for playing an active role in the field of Intelligent Power Module and Power IC technologies and contributing largely to the ISPSD. He was nominated to be one of the first 32 inductees to IEEE-ISPSD Hall of Fame for his pioneering global role in progressing IGBT and IPM technologies and was awarded the prestige in May 2018. He was promoted to IEEE Fellow in 2021. He lectured courses on advanced power semiconductor devices as a visiting professor at Kyushu

University and Tokyo Institute of Technology (TIT) for several years till 2019. Also, he has been bestowed with Honorary Professorship in 2016 by Amity University, India.

Arif Sarwat
Florida International University, USA

Dr. Arif Sarwat has been in the industry (Siemens) and academia for more than 20 years. He is an Eminent Scholar Chaired Professor in the Department of Electrical and Computer Engineering, the Director of the FPL-FIU Solar Research Facility and Energy Power Sustainability(EPS) group at FIU. He is also the Principal Investigator for the state-of-the-art grid-connected 3MW/9MWh AI-based Renewable (AIR) Microgrid long-term project funded by FPL. His research interests include smart grids, electric vehicles, high penetration renewable systems, storage, and battery management systems, grid resiliency, large-scale data analysis, artificial intelligence, advanced metering infrastructure, smart city infrastructure, and cybersecurity. He has published more than 200 peer-reviewed articles and multiple patents. He currently has multiple funded projects; funded by the National Science Foundation (NSF), industry, and the Department of Energy (DOE). This list includes the NSF CAREER Award. He is the co-lead on the Masters in Energy & Cybersecurity education program. Previously, Dr. Sarwat worked at Siemens for more than nine years, winning three recognition awards. He is the author/co-author of a publication that won the best paper award at the Resilience Week in 2017 and a technical article that won both the best paper award in 2016 as well as the most cited paper award in 2018 from Springer's Journal of Modern Power Systems and Clean Energy (MPCE). His team won the second-best paper award at IEEE NAPS conference in the year 2020.

Dr. Sarwat received the Faculty Award for Excellence in Research & Creative Activities in 2016, College of Engineering & Computing Worlds Ahead Performance in 2016, and FIU TOP Scholar Award in 2015 and 2019. He has been the chair of the IEEE Miami Section VT and Communication since 2012. He is an associate editor of the journals ACM Computing Surveys and IEEE IAS.

Dr. Tapan Sahoo

Executive Director (Engineering) at Maruti Suzuki India Limited

Dr. Tapan Sahoo is Executive Director (Engineering) at Maruti Suzuki India Limited and has over 32 years of experience in product design & development, supplier development, technology, cost and program management functions.

An Eminent Alumnus and graduate in Electrical Engineering from UCE – Burla, Dr. Sahoo continued his academic pursuit along with his professional work and completed his MBA and Ph.D. from Department of Management Studies, IIT Delhi.

Dr. Sahoo has played a key role in upgrading the R&D capability of MSIL in the Electrical & Electronics, xEV, Powertrain, Vehicle Engineering, Cost, Prototype, Design and Planning functions. He played an instrumental role to develop the design capability of auto component supplier in India as well.

Dr Sahoo participates and contributes in various Industry, Academia, Professional and Government bodies. Some of the key roles are:

Co-Chairman, Technical Council of SIAM (Society of Indian Automobile Manufacturers) encompassing Electric Mobility,

Sustainable Mobility, Connected vehicles, Styling & Design, Frontier Technology & Innovation, Manufacturing & Industry 4.0.

Past Chairman, International Harmonization Group of SIAM – engaged in understanding, alignment, and adaptability of international regulations for India

Past Chairman, Frontier Technology Group of SIAM; the group engaged in policy formulation for Hybrid and Electric vehicles in India along with Govt of India.

Chairman, India GRE group, Ministry of Road Transport and Highways (Govt. of India)

Chairman, SAEINDIA Northern Section, a non-profit society of automotive engineers, aiming to promote the cause of mobility

Member, CII National Committee on Future Mobility • Member, Board of Academics, MNNIT (Allahabad)

Member, OICA-GEE Panel (International Auto Manufacturer's Association – Lighting & Light Signaling Group)

Dr Sahoo holds multiple granted patents. His research papers in the areas of strategic technology management, xEV technologies and automotive product development & policy matters have been published in national and international journals of repute.

For his contribution in the field of engineering and technology management, Dr. Sahoo has been conferred "Fellow" status by Society for Technology Management and Indian National Academy of Engineering.

TUTORIAL SPEAKERS

Anurag Sharma,
Newcastle University, UK

Dr. Anurag Sharma (Member, IEEE) received his Ph.D. degree from the Department of Electrical and Computer Engineering, National University of Singapore. He is currently Degree Programme Director for MSc in Electrical Power Engineering at Newcastle University (UK), Singapore campus. His research interests are service restoration and grid resiliency, energy management in micro-grids, planning, and integration of distributed energy resources integration, and machine learning (ML) and artificial intelligence (AI) applications in power systems. He has delivered numerous invited talks and tutorials on decarbonization and enhancing the resilience of the grid. In addition to his research work, Dr. Sharma is also actively involved in professional and community service. He is currently serving as the Vice-Chair for IEEE PES Singapore Chapter.

Sayonsom Chanda,
National Renewable Energy Laboratory (NREL), Golden, Colorado, USA

Dr Sayonsom Chanda is a smart grid engineer and entrepreneur based in Boulder, Colorado, USA. Dr. Chanda has served in many roles in the energy industry – most recently as a senior researcher of energy systems integration at the National Renewable Energy Laboratory in Denver, Colorado, USA. As a renowned expert in developing artificial

intelligence technologies to combat climate change, he has been called to deliver lectures at conferences and panel sessions worldwide, including a TEDx talk in 2021.

Dr. Chanda has 6 years of experience working with three major American electricity distribution companies and two US Department of Energy national laboratories. Dr. Chanda has filed for three patents in cloud computing for the power grid. He has published more than 15 peer-reviewed papers in high-impact power systems journals. His research interests are focused on improving power systems simulation methods, load forecasting, and clean energy technologies to increase energy security and resilience for every individual on Earth.

He received his master's and Ph.D. degrees from Washington State University, USA. He is a Member of IEEE and has served as Vice-Chair of the IEEE Young Professionals Society and contributing member of the IEEE USA Energy Policy Committee. As an entrepreneur, Dr. Chanda has been successful in bringing two Cleantech startups to the market. He is also the co-author of a forthcoming title, 'Resilience of Smart Grid' by Wiley, UK.

Pranav Raikote,
Plexflo Grid Analytics, Boulder, Colorado

Pranav Raikote is a Senior AI Researcher at Plexflo, with several years of experience in the field of artificial intelligence and ML applications in the power industry. His work has been used in the industry for improving classical load forecasting applications for utilities in the US. He played a role in developing managed EV-charging programs in large fleets, estimating regional rooftop solar generation potential using satellite imagery, and methods for automated GIS tracking of utility poles using video streams from patrol vehicles. Pranav and his team at Plexflo have been working on Large-Language Models and Generative AI for several years and have contributed to high-impact projects and research work. Pranav is a sought-

after speaker in many local industry/academic conferences and student entrepreneurship competitions. In his free time, Mr. Raikote is a prolific contributor to open-source software and writes technical blogs on a variety of AI Topics, sharing his thoughts with the world. He also enjoys wildlife photography and is working on building his portfolio.

Title: Generative AI Applications for Power Systems

Abstract: Generative AI enables systems to create high-value artifacts, such as video, narrative, training data and even designs and schematics. In this tutorial we will show how these capabilities can be used in Power Systems to create constrained simulation models, synthetic data for machine learning applications, etc. We propose a 3-hour session, with two 30-min hands on workshop or live demo sessions of the new technology.

Sanjeet Kumar Dwivedi
Green Hydrogen Danish MNC Everfuel A/S

Dr. Sanjeet Kumar Dwivedi is Fellow of IET (UK) & working as Senior Technology Leader in Green Hydrogen Danish MNC Everfuel A/S. Prior to this he was Senior Research Leader at Danfoss, Denmark from 2008 to 2021. Prior to this, Dr. Sanjeet was an electrical engineer in Larsen and Toubro, an infrastructure company in India (1991-92), Electrical Engineer in CPWD, Government of India (GoI). He worked as senior faculty member of the Department of Technical Education, MP, India (1993-2006) and Dean R&D, Government Engineering College SAGAR MP India(2006-2008)

Dr Sanjeet has awarded with two master degrees, first one from IIT Roorkee, ME (Gold Medal) in Power Apparatus and Drives and second one from South Denmark University, M.Sc. Engineering in Innovation and Business. He has completed his Ph.D. degree in Green Technologies from IIT Delhi India. Dr.

Sanjeet also completed his executive leadership education from MIT Boston.

He was honored with adjunct professor at Curtin University, Perth, Australia (2016-18). Dr Sanjeet is Member of Faculty board of South Denmark University in the Innovation and Business department. Dr. Sanjeet has authored more than 40 technical papers and holds 11 international patents, three business trade and three books engineering research books published from Academic Press (UK) and IET Press (UK). He is an advisory board member of of International Journal of Power Electronics (IJPE), Associate Editor of the IEEE Transaction on Industrial Electronics (IEEE TIE). He has given invited presentations, organized and chaired special sessions in several IEEE and European Power Electronics conferences around the globe.

He is a recipient of Merit Award from Institution of India IE(I) (2006) for his research publication on permanent magnet machines. He was also awarded with 9th Man on the Moon Global Innovation Award from the CEO and President of Danfoss (2015) and another prestigious recognition as winner of IETE-Bimal Bose Award (2017) for outstanding contribution in power electronics and drive.

Title: Green Hydrogen: An Ideal Source for Safe and Reliable Energy for World

Abstract : Green Hydrogen has enormous potential for paradigm shift in the energy sector to fulfill the energy need of todays and also for future of entire world. On the same time Green hydrogen is able to provide its unstinted support and play a critical role in helping the world to reach net zero emissions and making our planet earth safe and secure for coming generations. In this keynote participants will have an in-depth knowledge exchange on the entire value chain of Green hydrogen including generations, storage, distribution and its safety practice.

Lalit Goel
NTU, Singapore

Prof. Lalit Goel obtained his Bachelor's Degree in electrical engineering from the Regional Engineering College, Warangal, India in 1983, and his MSc and PhD degrees in electrical engineering from the University of Saskatchewan, Canada, in 1988 and 1991 respectively. He joined the School of EEE at the Nanyang Technological University (NTU), Singapore, in 1991 where he is presently a professor of power engineering. He served as the Head of the Division of Power Engineering from July 2005 to August 2008, Deputy Director of NTU's Protective Technology Research Center (PTRC) from May 1999 to April 2007, Dean of Admissions & Financial Aid from July 2008 to June 2012, Director Undergraduate Education (Projects) in the President's Office from Jan 2013 to Dec 2015, Director of the Office of Global Education and Mobility from October 2014 until March 2018, and Director of India Connect @NTU program from July 2020 until June 2022. Since April 2018, Dr. Goel has been serving as the Director of the Renaissance Engineering Programme (REP). He received the 1997 & 2002 Teacher of the Year Awards for the School of EEE, "Best Teacher of Year 2" awards for 1999/2000, 2000/2001, 2001/2002, 2005/06 and 2009/2010, and the "Best Teacher of Year 3" awards for 2001/2002 and 2002/03. Dr Goel served as conference Chair for several power engineering conferences in Singapore. Dr. Goel received the IEEE PES Singapore Chapter Outstanding Engineer Award in 2000, and the IEEE PES Outstanding Power Engineering Educator Award in 2009. Dr. Goel served as the Editor for the International Journal of Electric Power Systems Research (EPSR) from 2002 to 2019. Dr. Goel served as the IEEE Singapore Section Chair from January 2007 to December 2008, and as the Asia-Pacific Representative on the IEEE PES

Governing Board from 2011 to 2016. Dr. Goel is a Fellow of the IEEE. He has published more than 195 international journal and conference papers in the areas of power system reliability, cost/benefit assessment, power markets and renewables.

Title: Power System Reliability Assessment Emphasizing Generating Capacity Reliability Evaluation

Abstract- This tutorial shall present the fundamental concepts of power system reliability and cost/worth evaluation, with special emphasis on generating capacity reliability assessment. The basic methodology for evaluating generating system reliability is to develop probability models for capacity on outage and for load demand, and calculate the probability of loss of load by a convolution of the two models. This calculation can be repeated for all the periods (e.g., weeks) in a year considering the changes in the load demand, planned outages of units, any unit additions or retirements, etc. The methods available to compute generating system reliability indices shall be covered in this module.

Pallavi Bharadwaj
IIT Gandhinagar

Dr. Pallavi Bharadwaj completed her Postdoctoral Research at Massachusetts Institute of Technology (MIT), USA in 2021 after receiving her Ph.D. from Indian Institute of Science (IISc), Bengaluru, India in 2019. Pallavi is a Gold Medalist for her industrial training and has received several awards including POSOCO Power System Award, Bhaskara Advanced Solar Energy Indo-US fellowship and serves in several National and International Technical Committees since 2017. She has previously served as a Faculty in Aalborg University, Denmark. She is very passionate about sustainability and strives towards engineering optimized solutions for global energy needs.

Her research interests broadly include design and control of renewable power conversion systems; modelling and optimization of energy storage solutions. Currently, she is the faculty at the Indian Institute of Technology, Gandhinagar.

Title: Battery Digital Twin for Performance Optimization

Abstract: Battery digital twin can be used for optimizing the battery pack performance, increase its lifetime and ensure operational safety by using data driven modelling and control algorithms. She will focus on sub topics like Battery modelling from simplicity to precision, Uncertainty aware battery temperature prediction, Battery degradation and aging mechanisms, Lifetime extension charging algorithms and Battery management system's role in performance optimization.

YOUNG PROFESSIONAL

Vinod Khadkikar,
Khalifa University, Abu Dhabi, UAE

Dr. Khadkikar is an IEEE Fellow and a Professor in the EECS Department at Khalifa University, Abu Dhabi, UAE. He is a Distinguished Lecturer of the IEEE Industry Applications Society. He received his M. Tech. degree in Power Electronics, Electrical Machines and Drives from the Indian Institute of Technology (IITD), New Delhi, India, in 2002 and PhD in Electrical Engineering from the École de Technologie Supérieure (ETS), Montréal, Canada, in 2008. From April 2010 to December 2010, he was a Visiting Professor at Massachusetts Institute of Technology (MIT), Cambridge, MA, USA. From December 2008 to March 2010, he was a Postdoctoral Fellow with the University of Western Ontario, London, ON, Canada.He has contributed around 75 IEEE Transactions papers, and has been

instrumental in attracting several external and internal research funds/grants as PI/Co-PI with a total amount of 28 million US$. He was ranked 142 among more than 100,000 researchers in Electrical and Electronic Engineering in the list of world's top 2% of career-long scientists as of September 2022 released by Stanford University. He is Co-EiC of the IEEE Transactions on Industrial Electronics and an Associate Editor of the IEEE Transactions on Industry Applications and IET Power Electronics Journal. He was an Associate Editor of the IEEE Transactions on Industrial Electronics from 2015 to 2023.

Dr. Khadkikar's research interests include applications of Power Electronics in Distribution Systems and Renewable Energy Resources, Power Quality Enhancement, Active Power Filters, Solid State Transformers, Microgrids, CubeSats and Electric Vehicles.

Arun Kumar Verma.
IIT Jammu

Dr. Verma earned his master's and Ph.D. from I.I.T. Delhi, New Delhi, India. He was a Postdoctoral research fellow (PDF) at the energy research institute (ERI@N), Nanyang Technological University (NTU) Singapore, during 2015-2016. Before joining NTU Singapore, he worked as a visiting graduate researcher (VGR) at the smart grid energy research center (SMERC), University of California Los Angeles (UCLA), California, USA, during 2014-2015. He won the prestigious BASE fellowship for advanced solar energy research in 2014. He has been conferred with the prestigious POSOCO Power System Research Award 2016. He is an assistant editor of the smart grid journal and a member of the editorial board for EPE Journal. He has been invited by Defense University College

Ethiopia and Metal Engineering Corporation Ethiopia as an instructor for M.Tech program in Renewable Energy Engineering from 7th May 2016 to 27th May 2016. To name a few. He is holding/completed DST research funding of 6 cr., including Mission Innovation (MI), SPARC, ECR, SERD, and CRG. He is also the mentor director for a startup Rishi Agastaya Technologies Pvt. Ltd. Dr. Verma has guided 5 Ph.D. and 11 MTech theses. 10 Ph.D. candidates are currently working under him.

Sivaneasan Bala Krishnan
Singapore Institute of Technology, Singapore

Dr Sivaneasan received the B.E. and Ph.D. degrees in Electrical and Electronic Engineering from Nanyang Technological University, Singapore, in 2007 and 2012 respectively. In 2011, he joined the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, as a Research Engineer and subsequently as a Research Fellow until 2015. He then joined Nanyang Polytechnic as a Lecturer in 2015. In 2019, he joined Singapore Institute of Technology as an Assistant Professor and subsequently promoted to an Associate Professor in 2023. He is registered as Chartered Engineer with UK Engineering Council.

Dr Sivaneasan conducted research and development in the areas of power engineering in particular microgrids and smart grid technologies. He has published more than 30 technical papers. He also co-authored a scholarly book chapter on Vehicle-to-Grid (V2G) for a book titled "Energy Storage forSmart Grids: Planning and Operation for Renewable and Variable Energy Resources (VERs)". In addition, he also won the "Best Innovation in Renewable Energy" award at National

Instruments ASEAN Graphical System Design Achievement Awards for his work on a functional smart grid prototype. His work on IIoT based electrical asset management system at a local shipyard won the Best Paper Award at the IEEE International Conference in Power Engineering Applications (ICPEA2022).

Currently, Dr Sivaneasan is actively involved in applied research projects with strategic industry partners to help the organizations implement new technologies that help improve productivity and work efficiency while ensuring a sustainable operation. His current research focuses on advanced metering infrastructure, condition monitoring system, renewable energy technologies, electric vehicles, energy storage systems, building energy management systems, demand response and smart grids. Till date, Dr Sivaneasan has gathered more than ten years of lecturing, tutoring and laboratory supervision experience in numerous electrical engineering modules. He is also a recognized Associate Adult Educator under the Institute for Adult Education.

He has taught various industry relevant Continuing Education and Training (CET) programs for working adults and foreign participants.