

Annual Conference of the IEEE Industrial Electronics Society (IECON 2021)

Special Session on

“DC-DC Converter Topologies and their Intelligent Control for Energy Storage Systems”

Organized by

Principal Organizer: (Mrs.) Varsha A. Shah, (vas@eed.svnit.ac.in)
Electrical Engineering Department, Sardar Vallabhbhai National Institute of
Technology, Surat, India

Organizer 1: Sachin Jain, (sjain.ee@nitrr.ac.in)
Electrical Engineering Department, National Institute of Technology, Raipur, India

Organizer 2: Brijesh Tripathi, (brijesh.tripathi@sse.pdpu.ac.in)
School of Technology, Pandit Deendayal Energy University,
Gandhinagar, India

Organizer 3: Makarand M. Lokhande, (mml@eee.vnit.ac.in)
Electrical Engineering Department, Visvesvaraya National Institute of Technology,
Nagpur, India

Organizer 4: Jawaharlal Bhukya, (jawahar2049@gmail.com)
Electrical Engineering Department, Government Engineering College, Raipur, India

Call for Papers

Theme:

In order to meet the demand of high starting torque of Electric Vehicle (EV), very high power is required during acceleration, whereas average power is required during rest part of the vehicle operation. At present and in the foreseeable future, the viable EVs energy sources are batteries, fuel cells, ultracapacitors. Batteries are the most mature source and Fuel Cells are comparatively less mature and expensive emerging source for EV application, which are characterized by a high energy density but a low power density energy sources. Batteries have not developed to provide the instantaneous high-power exchanged during sudden acceleration and deceleration. They typically provide the steady state power and have their own high response time. Ultracapacitors offers high power density, fast transient response, low weight, low volume and low internal resistance which make them suitable for pulsed load application which certainly enhance the life of the battery and save the battery from thermal runaway. Battery together with ultracapacitor and fuel cell together with battery / ultracapacitor makes an excellent hybrid energy sources for EVs. The voltage characteristics also have to match perfectly of each sources, to utilize full power capacity of each source. The

challenges for integrating the sources (of different characteristics) in EV are with the developing high power density dc-dc converters technology and intelligent control for energy management among the sources.

Topics of interest include, but are not limited to:

- High power density dc-dc converters for EV application
- High power density batteries for EV system
- Topologies for battery and ultracapacitors
- Optimal sizing of the battery with ultracapacitor
- Energy management for PV battery system
- Modelling of battery and ultra-capacitor
- Fractional order control for PV battery system
- Battery management system and its charging technologies
- Design of power sharing algorithms for converters for battery and ultracapacitors
- Control of bidirectional converters for regenerative braking dual energy sources
- Artificial intelligence for monitoring battery state of charge and state of health
- Battery and converter thermal management using ultracapacitor

Submissions Procedure: All the instructions for paper submission are included in the conference website: <https://attend.ieee.org/iecon-2021/>

Deadlines:

Full paper submission:	June 25, 2021
Paper acceptance notification:	July 30, 2021
Camera-ready paper submission:	Aug. 27, 2021

Biographies of Organizers:

Dr.(Mrs.) Varsha A. Shah (Member IEEE)

Professor, Electrical Engineering Department,
Sardar Vallabhbhai National Institute of Technology, Surat
Ichchhanath Surat- Dumas Road, Keval Chowk, Surat,
Gujarat 395007, India
Email: vas@eed.svnit.ac.in
Mobile: +91 7600057526



Dr. Varsha Ajit Shah, almost thirty two years of teaching and research experience received the B.E degree in electrical engineering from Maharaja Sayajirao University, Gujarat, India, in 1986, the M.E. degree in electrical engineering from Veer Narmad South Gujarat University, Gujarat, in 1990, and the Ph.D. degree in electrical engineering from the Sardar Vallabhbhai National Institute of Technology, Gujarat, in 2013. She has been an Associate Professor with the Department of Electrical Engineering, Sardar Vallabhbhai National Institute of Technology, since 1987. Her research activity is related to hybrid electric vehicles, smart grid and power quality issues. She has several publications in international journal and conferences. Under her supervision three PhD have completed and 5 are ongoing. She has deliver thirty plus expert lectures and establish laboratory, review journal papers, conference papers and PhD thesis.

Dr. Sachin Jain (Senior Member IEEE):

Associate Professor,
Department of Electrical Engg,
National Institute of Technology-Raipur,
GE Road, Raipur,
Chhattisgarh, India
Mob. +91 9441700975
sjain.ee@nitrr.ac.in



Dr. Sachin Jain received the B.E degree in Electrical Engineering from the Bhilai Institute of Technology, Bhilai, India in the year 2000, M.Tech degree in Integrated Power Systems from the Visvesvaraya National Institute of Technology, Nagpur, India in the year 2002 and Ph.D. degree from the Indian Institute of Technology, Bombay, India in the year 2007. He is currently working as an Associate Professor at the National Institute of Technology (NITRR), Raipur, India. Before joining NIT-Raipur, he had worked at NIT-Warangal as an Associate Professor and the Solar Energy Business Group of Schneider Electric as a Senior Design Engineer in the R&D Department at Bangalore. His research interests include power electronics applications in non-conventional energy conditioning, dc-dc converter topologies, electric drives, power quality, and distributed generation.

Dr. Brijesh Tripathi

Associate Professor,
Department of Physics, Cabin No. 206, E-Block,
School of Technology, Pandit Deendayal Energy University,
Raisan, Gandhinagar – 382426 India
Ph. +91 79 23275455 , Mob. +91 9687923119
brijesh.tripathi@sse.pdpu.ac.in



Dr. Brijesh Tripathi received the B.Sc. and M.Sc. degrees from C.S.J.M. University, Kanpur, India, in 2003 and 2005, respectively. He received the Ph. D. degree from Pandit Deendayal Petroleum University (PDP), Gandhinagar, India, in 2014. He is currently working as Associate Professor at Department of Physics, School of Technology, PDP. He is a life member of Solar Energy Society of India (SESI) and Indian Society for Technical Education (ISTE). He has gained expertise in thin-film deposition technologies through various vacuum and non-vacuum techniques. His research interests include solar photovoltaic, electronic device, electro-chemistry, and electric vehicle. He has authored 52 research papers in SCI Indexed Journals and a book on “Solar Energy from Cells to Grid”. Three students have successfully completed Ph.D. under his guidance and currently two students are registered under him for the doctoral work.

Dr. Makarand M. Lokhande (Senior Member IEEE),

Assistant Professor, Electrical Engineering Department,
Vivesvaraya National Institute of Technology, Nagpur
South Ambazari Road - 440010
Email: mml@eee.vnit.ac.in
Mobile No. +91 8980100625



Dr. Makarand M. Lokhande received B.E. from Nagpur University, India and M.E. (Power System) from University of Pune, India, in 2001 and 2003 respectively in Electrical Engineering and PhD from Energy Science and Engineering Department of IIT Bombay, India in 2010. Since July 2009 to August 2013 he was with Pandit Deendayal Petroleum University Gandhinagar in Gujarat, India as an Assistant Professor. Since 2013 to June 2015 he was with Electrical Engineering Department, Sardar Vallabhbhai National Institute of Technology Surat, India as an Assistant Professor and Since June 2015 he is with Department of Electrical Engineering, Visvesvaraya National Institute of Technology Nagpur as an Assistant Professor. His research interest are electric vehicle, solar photovoltaic, microgrids, power electronics and machines. He has several publications in international journal and conferences. He has also completed one DST project on Electric Vehicle. Under his supervision five PhD have completed and two are ongoing. He is a Senior IEEE Member and Life member of ISTE.

Dr. Jawaharlal Bhukya,

Assistant Professor, Electrical and Electronics Engineering Department
Government Engineering College - Raipur, Sejbahar, Old Dhamtari Road, Raipur, Chhattisgarh 492015
jawahar2049@gmail.com



He has obtained his doctoral degree (Ph. D.) from Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat, Gujarat in 2020 and master degree (M. Tech.) from IIT Roorkee in 2012. Graduated in Electrical Engineering from Osmania University (OU) in 2010. Currently working as Assistant Professor, Department of Electrical and Electronics Engineering, Government Engineering College – Raipur. He published about 16 research papers in reputed international journals and conferences. He has served as a reviewer for journals: International Transactions on Electrical Energy Systems, IEEE Journal of Emerging and Selected Topics in Power Electronics, IEEE Access and International Journal of Power and Energy Systems etc. He has completed two research projects as Principal Investigator and Co-Principal Investigator and sponsored by TEQIP Collaborative Research Scheme (CRS) under AICTE. His research areas are power system stability and the integration of wind energy, optimisation, FACTS and artificial intelligence, and electric vehicles. He is a life member of the Institution of Engineers India (IEI).

Reviewers

A list of potential reviewers and their affiliations:

Dr. Varsha A. Shah	Professor, SVNIT Surat, India	vas@eed.svnit.ac.in
Dr. Brijesh Tripathi	Associate Professor, PDEU, Gandhinagar, India	brijesh.tripathi@sse.pdpu.ac.in, brijesh.tspv@gmail.com
Dr. Makarand M. Lokhande	Assistant Professor, VNIT Nagpur	mml@eee.vnit.ac.in
Dr. Jawaharlal Bhukya	Assistant Professor, Government Engineering College - Raipur,	jawahar2049@gmail.com
Dr. Sachin Jain	Associate Professor, National Institute of Technology- Raipur, India	sjain.ee@nitrr.ac.in
Dr. Bidyadhar Subudhi	Professor, NIT-Rourkela, India	bidyadhar@nitrkl.ac.in
Dr. Nitai Pal	Associate Professor; IIT (ISM - Dhanbad), India	nitai@iitism.ac.in
Dr. Madhusudan Singh Yadav	Professor, Delhi Technical University, India	madhusudan@dce.ac.in
Dr. Narasimharaju B. L	Associate Professor; NIT – Warangal, India	blnraju@nitw.ac.in, narasimharaju.bl@gmail.com
Dr. Li Wang	Professor; National Cheng Kung University, India	liwang@mail.ncku.edu.tw
Dr. Dheeraj K Khatod	Associate Professor	dheerfee@iitr.ac.in

	IIT – Roorkee, India	
Dr. Jayati Dey	Electrical Engineering, NIT Durgapur, India	jayati.dey@ee.nitdgp.ac.in
Prof. Vima Mali	Assistant Professor Pandit Deendayal Energy University, Gandhinagar, India	vima.mali@sot.pdpu.ac.in
Prof. Sreejith R	Assistant Professor Pandit Deendayal Energy University, Gandhinagar, India	sreejith.R@sot.pdpu.ac.in
Dr. Kundan Kumar	Assistant Professor Pandit Deendayal Energy University, Gandhinagar, India	kundankumar@nitmanipur.ac.in
Dr. Anmol Sexana	Assistant Professor Department of Electrical & Electronics Engineering, National Institute of Technology Delhi New Delhi, India	anmol.saxena@ee.iitd.ac.in
Dr. Subhojit Ghosh	Associate Professor, National Institute of Technology-Raipur, India	sghosh.ele@nitrr.ac.in
Dr Lalith Kumar	Assistant Professor National Institute of Technology-Raipur, India	lkumar.ele@nitrr.ac.in
Prof. Vijay Kumar	Professor & Head, SRM University, India	hod.eee.ktr@srmist.edu.in
Dr. Kirubakaran	Assistant Professor - Electrical Engineering Department NIT Warangal, India	kiruba81@nitw.ac.in
Dr. Phani Teja	SRM university, India	bphaniteja123@gmail.com
Mr. Rahila Parveen	Lecture, National Institute of Technology-Raipur, India	rahila.akhtar@gmail.com
Mr. Vijaya Vardhan Reddy P.	Lecture, National Institute of Technology-Raipur, India	vardhan258@gmail.com
Prof. V. P. Dhote	Assistant Professor, Government college of Engineering, Aurangabad	vpdhote@gmail.com
Prof. Sourabh Jain	Lecture, SATI Vidisha, India	jain.sourabh85@gmail.com

Rajarshi Saha	NIT Durgapur, West Bengal, India	rajarshi64@gmail.com
Dr. Irfan Ahmed	Lecture, Assistant Professor, NIT Durgapur, West Bengal, India	ahmed.irfan@ee.nitdgp.ac.in
Mr. Rajdip Dey	Trainee Teacher, NIT Durgapur, West Bengal, India	rajdip.dey@ee.nitdgp.ac.in
Dr. Manoj Rathi	Director, RCSS (Research Center For Sustainable Solution Pvt. Ltd.), Nashik, India	manojrathi@rcssgroup.com
B Dastagiri Reddy	Assistant Professor, NIT Surathkal, India	dastagiri.reddy@nitk.edu.in
S. Tolani	Assistant Professor, SVNIT Surat, India	sanjay.tolani@eed.svnit.ac.in
Fenil S Patel	Assistant Professor, Babaria Institute of Technology, BITS Edu Campus. India	fenilpatel.ee@bitseducampus.ac .in

A list of potential authors and their affiliations:

Dr. Varsha A. Shah	Professor, SVNIT Surat, India	vas@eed.svnit.ac.in
Dr. Brijesh Tripathi	Associate Professor, PDEU, Gandhinagar, India	brijesh.tripathi@sse.pdpu.ac.in
Dr. Makarand M. Lokhande	Assistant Professor, VNIT Nagpur, India	mml@eee.vnit.ac.in
Dr. Jawaharlal Bhukya	Assistant Professor, Government Engineering College - Raipur, India	jawahar2049@gmail.com
Dr. Sachin Jain	Associate Professor, National Institute of Technology-Raipur, India	sjain.ee@nitrr.ac.in
Prof. Vima Mali	Assistant Professor Pandit Deendayal Energy University, Gandhinagar	vima.mali@sot.pdpu.ac.in
Dr. Subhojit Ghosh	Associate Professor, National Institute of Technology- Raipur, India	sghosh.ele@nitrr.ac.in
Dr. Vinod Khadkikar	Professor, Department Of Electrical Engineering And Computer Science,	vinod.khadkikar@ku.ac.ae

	Khalifa University	
Dr. Dogga Raveendhra	Chief Technology Officer (C.T.O) Zunik Energies Pvt. Ltd., India	doggaravi09@gmail.com
Dr. Jayati Dey	Associate Professor, NIT Durgapur, West Bengal, India	jayati.dey@ee.nitdgp.ac.in
Dr. Ritesh Keshri	Assistant Professor, VNIT Nagpur, India	riteshkeshri@gmail.com
Dr. V. SANDEEP,	HEAD, Department of Electrical Engineering, National Institute of Technology (NIT) Andhra Pradesh, India	sandeep@nitandhra.ac.in
Dr. Susovon Samanta	Department of Electrical Engineering, National Institute of Technology, Rourkela, India	samantas@nitrkl.ac.in
Dr. Sheldon S. Williamson	Professor, Department of Electrical and Computer Engineering The University of Ontario Institute of Technology, Oshawa, ON, Canada	sheldon.williamson@uoit.ca
Dr. Akshay Kumar Rathore	Department of Electrical and Computer Engineering nConcordia University Montreal, QC, Canada	akshay.rathore@concordia.ca
Dr. Mahesh K. Mishra	Professor, Indian Institute of Technology Department of Electrical Engineering, Chennai, India	mahesh@ee.iitm.ac.in
Dr. Amit Patra	Battery Management and Integrated Systems Lab, IIT Kharagpur, India	amit@ee.iitkgp.ac.in