



I am an Associate Professor in the Department of Electrical Engineering and a core committee member in the Centre for Sustainable Development at [Indian Institute of Technology Gandhinagar](#), India. Before I joined IIT Gandhinagar, I was a research fellow in the Department of Electrical and Computer Engineering at [National University of Singapore](#), Singapore in 2010. I received my PhD degree in Electrical Engineering from [Indian Institute of Technology Kanpur](#), India in 2009. My focused research interests include electricity market, smart distribution grid/microgrids and grid integration of distributed renewable energy and demand side energy management.

I lead [Power Systems and Smart Grid Laboratory](#) at IIT Gandhinagar, where my research group focuses on active distribution grid management and flexible electricity market including demand side management through digitalization - *for the successful transition to a low-carbon sustainable energy ecosystem*. Our specific expertise is in developing the hardware-software toolkits for demand side energy management - for distributed renewable energy and battery storage integration, and peer-to-peer energy trading and demand response participation by energy consumers. The research findings benefit for *better distribution network efficiency, resiliency and reduced carbon footprint* in power and energy systems.

We execute the *industry relevant national/international collaborative research* and consultancy projects to develop a strong industry-academic research program for supporting the successful transition to a promising environmentally sustainable *energy ecosystem* that involves (1) optimal utilization of distributed clean energy resources (2) developing smart grid technologies and (3) promoting energy efficiency at MSMEs industries and electricity distribution systems.

I am PI of the [Central Power Research Institute \(CPRI\)](#) funded project “*Cyber-Attack Analysis Toolkit for Cyber-Physical Distribution System Security [CyberDiSS]*”. I have recently completed the international collaborative research projects: [Indo-German \(IGSTC\)](#) industry relevance project on “*ECO-WET: Efficient Coupling of Water and Energy Technologies for Smart Sustainable Cities*”, and [DST Mission Innovation - Smart Grid](#) project on “*Development of Prosumer Driven Integrated SMART grid*”.

Recently, I received the [India Smart Grid Forum \(ISGF\) Innovation Awards 2023](#) – [Platinum award](#) for the award category “Smart Technology – Electricity Distribution, to recognize our technological innovation “SMART AGENT: A Universal IoT-based Smart Energy Management Device”. Also, I am a recipient of the *IEEE Power & Energy Society (PES) Gujarat Chapter Outstanding Engineer award* (2017) to recognize my research contribution in power systems and smart grid. In addition, I received the prestigious [Building Energy Efficiency Higher & Advanced Network \(BHAVAN\) Fellowship](#) by India-US Science and Technology Forum (IUSSTF) in 2016. I guided Four PhD and 21 MTech Theses and presently supervising five PhD and two MTech theses. I am co-author/author of 85+ research papers in peer-reviewed international journals and IEEE conferences, and six book chapters.

I am a senior member of IEEE, member of IEEE-PES and IEEE-IAS, Fellow of IETE and Institution of Engineers (India).

Brief CV

Naran M Pindoriya, SMIEEE, Fellow IETE, Fellow IE(I)
Associate Professor, Department of Electrical Engineering
Indian Institute of Technology Gandhinagar
Palaj, Gandhinagar - 382055, Gujarat, India

Research Interests:

- Electricity market and Smart distribution grid/microgrids, Cyber-physical power system security
- Grid integration of distributed renewable energy and Battery energy storage
- Demand side energy management - peer-to-peer energy trading and demand response

Qualifications:

Degree	Institution	Year
PhD	Indian Institute of Technology Kanpur, Kanpur	2009
ME	Faculty of Technology & Engineering, MS University of Baroda, Vadodara	2003
BE	LD College of Engineering, Gujarat University, Ahmedabad	2001

Employment Experience:

S. No.	Position & Organisation	Nature of Job	Period
1	Associate Professor , Department of Electrical Engineering, IIT Gandhinagar, Gujarat	Teaching & Research	April 2018 - Till date
2	Assistant Professor , Department of Electrical Engineering, IIT Gandhinagar, Gujarat	Teaching & Research	Nov. 2010 – Apr. 2018
3	Research Fellow , Department of Electrical and Computer Engineering, National University of Singapore, Singapore	Research	Jan. 2010 – Nov. 2010
4	Sr. Project Engineer , Department of Electrical Engineering, Indian Institute of Technology Kanpur, India	Research	Oct. 2009 – Dec. 2009
5	Research Scholar & Teaching Assistant , Department of Electrical Engineering, Indian Institute of Technology Kanpur, India	Research	Jan. 2006 – Sept. 2009
6	Lecturer , Department of Electrical Engineering, Charotar Institute of Technology-Changa, Gujarat University	Teaching	May 2003 - Dec. 2005

Awards/special recognitions:

1. Our technology innovation SMART AGENT received [India Smart Grid Forum \(ISGF\) Innovation Awards 2023– Platinum award](#) for the award category “Smart Technology – Electricity Distribution; SMART AGENT: A Universal IoT-based Smart Energy Management Device - enables electricity consumers to participate in wide range of demand-side management programs – Peer to Peer (P2P) energy trading, Demand Response, etc for the successful transition to a low-carbon sustainable energy ecosystem.
2. A PhD student – Sachinkumar Suthar - from my research group received PMRF Fellowship (2021-2023).
3. Two MTech students pursued research under my supervision won the [POSOCO Power System Award \(PPSA\)](#) in 2020 and 2021 for their Master thesis contributions in power and energy systems.
4. *IEEE Power & Energy Society (PES) Gujarat chapter Outstanding Engineer award* (2017) to recognize the research contribution in power systems and smart distribution grid.
5. *Newton-Bhabha award* for organizing the India UK Advanced Training School (IUATS), 2016
6. *Building Energy Efficiency Higher & Advanced Network (BHAVAN) Fellowship* (2016) awarded by India-US Science and Technology Forum (IUSSTF) for short term research at VirginiaTech University - Advanced Research Institute (ARI), VA, USA.

Industry-Academic Collaborations and National/International Research Projects:

We collaborate with electric power utilities/industries to exchange technical-scientific knowledge and develop active industry-academic collaborations to help solving the real-life technical challenges for the successful transition to a sustainable energy ecosystem. Our recent technological developments related to peer-to-peer energy trading and demand response toolkit and energy management platform, as highlighted below have received great interest from electric power industries.

- We developed proof of concept (PoC) and test rig at IITGN to demonstrate the real-world application of demand side energy management programs – Peer-to-Peer (P2P) energy sharing and Demand Response (DR) & further **pilot project demonstration at electricity distribution companies** - viz., [BSES Rajdhani Power Ltd. \(BRPL\) Delhi](#) and [CESC, Kolkata](#). Over 500 energy trades were conducted and demonstrated multiple use cases at the power utility scale. Also, two PoCs were conducted at BRPL, Delhi and CESC, Kolkata to demonstrate how the DR program benefit in peak power shaving and load shifting for residential, commercial and industrial consumers. This industry-academic collaborative research was supported by **DST-Mission Innovation Smart Grid Project** on “Development of Prosumer-driven Integrated Smart Grid.
- In that project, we developed **SMART AGENT: A Universal IoT-based Smart Energy Management Device** – that monitors and optimizes energy usage for all flexible energy assets, making it a great fit for managing energy demands, including *P2P energy trading* and *Demand Response* programs. This technological innovation received [India Smart Grid Forum \(ISGF\) Innovation Awards 2023 – Platinum award](#) for the award category “Smart Technology – Electricity Distribution.
- We developed the *innovative hardware and software tools for efficient operation of water and electricity infrastructure* via in-house developed energy optimiser while utilising the onsite clean energy resources - Solar PV and Battery Energy Storage System (BESS), in smart sustainable cities

testbed. Further, the *developed tools were tested and validated at water and electricity infrastructures – WTP, STP and Street lightings at [GIFT City Gandhinagar](#) testbed*. This industry relevant project was funded by [Indo-German Science & Technology Center \(IGSTC\)](#) **Project** titled “Efficient Coupling of Water & Energy Technologies for Smart and Sustainable Cities (ECOWET)”.

- We support Micro, Small & medium Scale Enterprise (MSMEs) industries by conducting detailed *energy assessment studies to enhance their overall energy efficiency and reduce the carbon footprints*. The Energy Assessment and Sustainability study work, being performed by the project team, has the core objective to identify, evaluate, and recommend through analyses of industrial plant operations – opportunities to conserve energy, minimize waste, and reduce the overall cost of operations. We have completed **total 21 detailed energy audits** and **46 walkthrough assessment** at various industry clusters in Gujarat including Ceramic, Diamond, Textile, Chemical, Cold storages, Metal, etc. and has achieved significant *saving in energy bills (INR 270 Lakhs)* and *reduction in carbon emission equivalent (3500 tCo₂ eq)*. This initiative started under Kotak-IITM Save Energy Mission (KISEM – a CSR initiative by Kotak Mahindra Bank).
- In addition, I extend the technical consultancy services to [Gujarat Urja Vikas Nigam Ltd \(GUVNL\)](#) and electricity distribution company [Uttar Gujarat Viji Co. Ltd \(UGVCL\)](#) for the smart distribution grid pilot project in Gujarat.

National/International Collaborative Research Projects:

Sr.	Title	Collaborators	Sponsoring Agency	Duration
1	[PI] Cyber-Attack Analysis Toolkit for Cyber-Physical Distribution System Security [CyberDiSS]	Sole	Central Power Research Institute (CPRI), Bangalore	Feb 2022 – Aug 2023
2	[PI] Efficient Coupling of - Water and Energy Technologies for Sustainable Smart Cities [ECO-WET]	Fortiss, Munich, GmbH Sonnen, GmbH Gujarat International Finance Tec-City (GIFT city), Gandhinagar	Indo-German Science and Technology Center (IGSTC)	April 2018 –July 2022
3	[Co-PI] Development of a Prosumer Driven Integrated SMART grid	Indian Institute of Management Ahmedabad	Department of Science and Technology (DST) (Mission Innovation – Smart Grid)	July 2018 – March 2022
4	[Co-PI] Understanding the impact of air pollution on solar photovoltaics and developing surface engineered panel materials for improved performance of solar plants	Duke University, USA	Department of Science and Technology (DST), Program: SPARC	March 2019 – March 2022
5	[PI] Data-Driven Intelligent Energy Management for Environmentally Sustainable Energy Access	University of Edinburgh, UK and Queen’s University, Belfast, UK	Department of Science and Technology (DST), UKIERI	June 2017 – Nov 2020

6	[PI] Smart Integrated Campus Energy Monitoring and Management System	Sole	Science and Engineering Research Board, DST	March 2017 – Sept 2020
---	--	------	---	------------------------

Consultancy Projects:

S. No	Title	Sponsoring Agency
1	[PI] Design and develop a cyber-physical system for cyber security assessment in smart distribution grid	Newcastle Research and Innovation Institute (NewRIIS), Newcastle University in Singapore
2	[PI] IITGN-KISEM, IIT Madras – Industrial Energy Assessment	Kottak IITM Save Energy Mission, IIT Madras
3	Two-week residential training program “System Operation and Commercial Aspects of Power Purchase, Open Access, & Energy Accounting” for officers of GUVNL	Gujarat Energy Training and Research Institute – Gujarat Urja Vikas Nigam Ltd, Gujarat
4	“Smart Grid pilot project – UGVCL” association with Uttar Gujarat Vij Company Ltd. (UGVCL), a one of the power distribution companies in Gujarat	UGVCL” association with Uttar Gujarat Vij Company Ltd. (UGVCL)

Research Students/Project Staffs Mentorship:

I lead the [Power Systems and Smart Grid Laboratory](#) at IIT Gandhinagar. This lab is equipped with a fully digital real-time power engineering simulation platform consists of **Opal-RT (OP4508 F11-3+1) real-time digital simulator – OP5600** and customized hardware and firmware for *Hardware-in-the-loop (HIL)* and *Rapid control prototype (RCP)* simulation studies. This lab is also equipped with power systems simulation packages –**DiGSILENT Power Factory, CYMDIST, NetSim**, and **GAMS optimization** tools.

This lab hosts research students (PhD and MTech), project research staff (Postdoc, RAs and JRFs) and short-term visiting students/faculty colleagues. I have supervised four PhD theses and 21 MTech Theses and am presently supervising five PhD and two MTech theses. In the past, I supervised research project staff at various levels and also short-term interns – for instance a few UG students and a faculty from University of Jaffna, Sri Lanka and two students from University of Moratuwa, Sri Lanka spent a few months in PS&SG lab. Please refer <https://naran.people.iitgn.ac.in/people/> for a list of research students/project staff affiliated with PS&SG lab.

Selected Recent Publications:

The research findings of [Power Systems and Smart Grid research lab](#) (PS&SG) has been published in scholarly journals and IEEE conference proceedings and these are very well cited in the power and energy research community ([Google Scholar](#): citations: 1981 and h-index: 25). Selected research publications are listed below, a full list is available at <https://naran.people.iitgn.ac.in/publications/>.

Referred Journals

- Poornachandratejasvi Laxman Bhattar, Naran M. Pindoriya, Anurag Sharma, and R T Naayagi, "AC-DC Multi-phase Power Flow Algorithm for Active Distribution System Analysis", *Electric Power Systems Research*, Accepted in October 2023, [Impact factor: 3.818].
- Sachinkumar Suthar, S. Hari Charan Cherukuri, and Naran M. Pindoriya, "Peer-to-peer energy trading in smart grid: Frameworks, implementation methodologies, and demonstration projects," *Electric Power Systems Research*, vol. 214, Part A, 108907, January 2023 [Impact factor: 3.818].
- Marcos-Tostado Véliz, Bablesh Kumar Jha, Salah Kamel, Naran M. Pindoriya, and Francisco Jurado, "A Three-Stage Stochastic-IGDT Model for Photovoltaic-Battery Domestic Systems Considering Outages and Real-Time Pricing", *Journal of Cleaner Production*, vol. 370, 133558, October 2022, In press [Impact factor: 11.072].
- Abhishek Tiwari and Naran M Pindoriya, "Automated Demand Response in Smart Distribution Grid: A Review on Metering Infrastructure, Communication Technology and Optimization Models", *Electric Power Systems Research*, vol. 206, May 2022 [Impact factor: 3.818].
- P.B.S. Kiran and Naran M. Pindoriya, "DLMP Calculation and Congestion Minimization with EV Aggregator Loading in a Distribution Network Using Bi-Level Program", *IEEE Systems Journal*, vol. 15, no. 2, June 2021 [Impact factor: 3.931].
- Poornachandratejasvi Bhattar, Naran Pindoriya, and Anurag Sharma "A Combined Brief Survey on Challenges in Distribution System State Estimation and False Data Injection in Cyber-Physical Power Distribution Network," *IET Cyber-Physical Systems: Theory & Applications*, vol. 6, pp. 41-62, April 2021.
- P.B.S. Kiran and Naran Pindoriya, "Demand Response in Consumer-Centric Electricity Market: Mathematical Models and Optimization Problems," *Electric Power Systems Research*, vol. 193, April 2021 [Impact factor: 3.414].
- Rishabh Abhinav and Naran Pindoriya, "Risk-Constrained Bidding for a Wind Power Producer with Battery Energy Storage System using Extended Mathematical Programming," *IET Renewable Power Generation*, vol. 15, pp. 689–700, January 2021 [Impact factor: 3.48].
- Sachinkumar Suthar and Naran Pindoriya, "Energy Management Platform for Integrated Battery-based Energy Storage – Solar PV System: A Case Study," *IET Energy Systems Integration*, vol. 2, no. 4, pp. 373-381, Dec. 2020.
- S Hari Charan Cherukuri, Ravindra B. Kuhada, Vishal M. Kachhad, and Naran Pindoriya, "A Real time Control Strategy for Improvement of Autonomous Operation in AC/DC Micro grids using Electric Springs," *International Transactions on Electrical Energy Systems*, vol. 30, no. 12, Dec. 2020. [Impact factor: 2.860].
- Batchu Rajasekhar, Wayes Tushar, Clement Lork, Yuren Zhou, Chau Yuen, Naran Pindoriya, and Kristin L Wood, "A Survey of Computational Intelligence Techniques for Air-conditioners Energy

Management”, *IEEE Transactions on Emerging Topics in Computational Intelligence*, vol.4, no.4, pp. 555 – 570, Aug 2020 [Impact factor: 4.851].

- Batchu Rajasekhar and Naran M. Pindoriya, “Heuristic Approach for Transactive Energy Management in Active Distribution Systems”, *IET Smart Grid*, vol. 3 no. 3, pp. 406 – 418, June 2020.
- Kushan A. Choksi, Sonal Jain, and Naran M. Pindoriya, “Feature Based Clustering Technique for Investigation of Domestic Load Profiles and Probabilistic Variation Assessment: Smart Meter Dataset”, *Sustainable Energy, Grids and Networks*, vol. 22, June 2020 [Impact factor: 5.405].
- Dhanapala Prudhviraaj, P.B.S. Kiran, and Naran M. Pindoriya, “Stochastic Energy Management of a Microgrid with Nodal Pricing”, *Journal of Modern Power Systems and Clean Energy*, vol. 8, no. 1, Jan. 2020 [Impact factor: 4.469]
- Sonal Jain, Kushan Ajay Choksi, and Naran M. Pindoriya, “Rule-based Classification of Energy Theft and Anomalies in Consumers Load Demand Profile”, *IET Smart Grid*, vol. 2, no. 4, pp. 612-624, Dec. 2019.
- Vishal Kushwaha and Naran M. Pindoriya, “A SARIMA-RVFL Hybrid Model Assisted by Wavelet Decomposition for Very short-term Solar Power Generation Forecast”, *Renewable Energy*, vol. 140, pp. 124-139, Sept. 2019 [Impact factor: 8.634].
- Batchu Rajasekhar, Naran M. Pindoriya, Wayes Tushar, and Chau Yuen, “Collaborative Energy Management for a Residential Community: A Non-Cooperative and Evolutionary Approach”, *IEEE Transactions on Emerging Topics in Computational Intelligence*, vol. 3, no. 3, pp. 177-192, June 2019 [Impact factor: 4.851].
- P.B.S. Kiran and Naran M. Pindoriya, “Centralized Stochastic Energy Management Framework of an Aggregator in Active Distribution Network”, *IEEE Transactions on Industrial Informatics*, vol. 15, no. 3, pp. 1350-1360, March 2019 [Impact factor: 10.215].
- Rishabh Abhinav and Naran M. Pindoriya, “Opportunities and Key Challenges for Wind Energy Trading with High Penetration in Indian Power market”, *Energy for Sustainable Development*, vol. 47, pp. 53-61, 2018 [Impact factor: 5.655].
- Kalpesh Joshi, Naran M. Pindoriya, and Anurag Srivastava, “A Two-Stage Fuzzy Multi-Objective Optimization for Phase-Sensitive Day-Ahead Dispatch of Energy Storage”, *IEEE Systems Journal*, vol. 12, no. 4, pp. 3649-3660, Dec 2018 [Impact factor: 3.931].
- Kalpesh Joshi and Naran M. Pindoriya, “Advances in Distribution System Analysis with Distributed Resources: Survey with a Case Study”, *Sustainable Energy, Grids and Networks*, vol. 15, pp. 86-100, Sept. 2018 [Impact factor: 3.899].
- G Rakesh and Naran M. Pindoriya, “Improved Control Strategy for Bi-directional Single Phase AC-DC Converter in Hybrid AC/DC Microgrid”, *Electric Power Components and Systems*, vol. 45, no. 20, pp. 2293-2303, 2017 [Impact factor: 1.071]
- Kalpesh Joshi and Naran M. Pindoriya, “Case-Specificity and its Implications in Distribution Network Analysis with Increasing Penetration of Photovoltaic Generation”, *CSEE Journal of Power and Energy Systems*, vol. 3, no. 1, pp. 101 – 113, March 2017 [Impact factor: 3.938].

Conference Proceedings

- Yash Vardhan Omar, Souvik Bera, and Naran M. Pindoriya, "Optimal Energy Procurement Strategy for DISCOM: A Case Study", *2023 IEEE Region 10 Symposium (IEEE TENSYP 2023)*, 6-8 September 2023, Canberra, Australia.
- Devesh Kumar and Naran M. Pindoriya, "Optimal Energy Management of District Cooling System and Energy Storage Systems: A Case Study", *2023 IEEE Region 10 Symposium (IEEE TENSYP 2023)*, 6-8 September 2023, Canberra, Australia.
- Bablesh Kumar Jha, Abhishek Tiwari, and Naran M Pindoriya, "Energy Assessment of Academic Campus: IIT Gandhinagar as a Case Study", *2022 IEEE PES 22st National Power Systems Conference (NPSC 2020)*, IIT Delhi, Dec 17-19, 2022, pp. 1-5.
- Jainendra Jain, Sachinkumar Suthar, and Naran M Pindoriya, "A Bid Limit-based P2P Energy Trading Framework", *2022 IEEE PES Innovative Smart Grid Technologies Asia (ISGT Asia)*, Singapore, Nov 1-5, 2022, pp. 255-259.
- Poornachandratejasvi Laxman Bhattar, Naran M Pindoriya, Anurag Sharma, and R T Naayagi, "False Data Injection Attack Detection with Feedforward Neural Network in Electric Vehicle Aggregator Bidding Price", *2022 IEEE PES Innovative Smart Grid Technologies Asia (ISGT Asia)*, Singapore, Nov 1-5, 2022, pp. 665-669.
- Satish Kumar Singh, P B S Kiran, and Naran M Pindoriya, "Quantized Gradient Multiplier based Energy Management with Limited Data Communication", *2022 IEEE Region 10 Symposium (TENSYP)*, IIT Bombay, July 1-3, 2022.
- Syed Nafiz Hasan, Satish Kumar Singh, and Naran M Pindoriya, "Study of Optimally Located Electric Vehicle Charging Stations for Frequency Control Service in Distribution Network", *9th International Conference on Power Systems 2021 (ICPS 2021)*, IIT Kharagpur, December 16-18, 2021.
- Priyanka Sharma, Abhishek Tiwari, and Naran M Pindoriya, "Multi-Objective Optimization based Automated Demand Response Model in Smart Distribution Grid", *9th International Conference on Power Systems 2021 (ICPS 2021)*, IIT Kharagpur, December 16-18, 2021.
- Abhishek Tiwari, and Naran M Pindoriya, "Automated Demand Response for Residential Prosumer with Electric Vehicle and Battery Energy Storage System", *9th International Conference on Power Systems 2021 (ICPS 2021)*, IIT Kharagpur, December 16-18, 2021.
- Poornachandratejasvi Laxman Bhattar, Naran M Pindoriya, and Anurag Sharma, "Impact of Brute Force Based False Data Injection Attack on Distribution System State Estimation", *2021 IEEE Region 10 Conference (TENCON 2021)*, Auckland, New Zealand, 7-10 Dec 2021, pp. 562-567.
- Sachinkumar Suthar and Naran M Pindoriya, "Blockchain and Smart Contract based Decentralized Energy Trading Platform", *2020 IEEE PES 21st National Power Systems Conference (NPSC 2020)*, IIT Gandhinagar, Dec 17-19, 2020, pp. 1-5.
- Shivashankar Sukumar, Naran M Pindoriya, Abhinav Ahuja, and Rahul Verma, "Forecast and Energy Management System (F-EMS) Framework for Optimal Operation of Sewage Treatment Plants", *2020 IEEE PES 21st National Power Systems Conference (NPSC 2020)*, IIT Gandhinagar, Dec 17-19, 2020, pp. 1-6.
- Devesh Kumar and Naran M Pindoriya, "A review on 5G Technological Intervention in Smart Grid", *2020 IEEE PES 21st National Power Systems Conference (NPSC 2020)*, IIT Gandhinagar, Dec 17-19, 2020, pp. 1-6.

- Abhishek Tiwari and Naran M Pindoriya, "Optimal Scheduling of Home Appliances under Automated Demand Response", *2020 IEEE PES 21st National Power Systems Conference (NPSC 2020)*, IIT Gandhinagar, Dec 17-19, 2020, pp. 1-6.
- Devesh Kumar, Rishabh Abhinav, and Naran M Pindoriya, "An Ensemble Model for Short-term Wind Power Forecasting using Deep Learning and Gradient Boosting Algorithms", *2020 IEEE PES 21st National Power Systems Conference (NPSC 2020)*, IIT Gandhinagar, Dec 17-19, 2020, pp. 1-6.
- Satish Kumar Singh, PBS Kiran, and Naran M Pindoriya, "ADMM Algorithm based Distributed Energy Management in Active Distribution Network", *2020 IEEE PES 21st National Power Systems Conference (NPSC 2020)*, IIT Gandhinagar, Dec 17-19, 2020, pp. 1-6.
- Ravindra B Kuhada, Anandsingh P Chauhan, and Naran M Pindoriya, "Real-time Simulation of V2G Operation for EV Battery", *2020 IEEE PES 21st National Power Systems Conference (NPSC 2020)*, IIT Gandhinagar, Dec 17-19, 2020, pp. 1-6.
- Vishal M Kachhad and Naran M Pindoriya, "Impact Assessment of APFC and Solar PV on IITGN Ring main Distribution Network", *2020 IEEE PES 21st National Power Systems Conference (NPSC 2020)*, IIT Gandhinagar, Dec 17-19, 2020, pp. 1-5.
- Payal V Dahiwale and Naran M Pindoriya, "Fault Management Scheme for Islanded DC Microgrid", *2020 IEEE PES 21st National Power Systems Conference (NPSC 2020)*, IIT Gandhinagar, Dec 17-19, 2020, pp. 1-6.
- Suresh Velamuri, S Hari Charan Cherukuri and Naran M Pindoriya, "Micro grid level Holistic Approach for Scheduling Heating Loads and Electric Vehicles", *2020 IEEE PES 21st National Power Systems Conference (NPSC 2020)*, IIT Gandhinagar, Dec 17-19, 2020, pp. 1-6.
- Yuanda Gao, Desen Kirli, Mehdi Zeinali, Shubhankan Mukherjee, Aziza Birzhanova, John Thompson, Naran Pindoriya, Aristides Kiprakis, "Development of a Hardware in-the-Loop Co-Simulation Platform for Smart Distribution Networks", *2020 15th International Conference on Ecological Vehicles and Renewable Energies (EVER)*, Monaco, Sept. 10-12, 2020.
- Anish Mathew, Deepak P, Sahely Bhadra, Naran Pindoriya, Aristides Kiprakis, and S N Singh, "Time Series Representation Learning Applications for Power Analytics", *2019 20th IEEE International Conference on Intelligent System Application to Power Systems (ISAP 2019)*, New Delhi, 10-14 Dec 2019, pp. 1-6.
- Payal Dahiwale and Naran Pindoriya, "Review on Fault Management in Hybrid Microgrid," *2019 IEEE Region 10 Symposium (TENSYP 2019)*, Kolkatta, India, 7-9 June 2019.
- Sachinkumar Suthar and Naran Pindoriya, "Cost-effective Energy Management of Grid-connected PV and BESS: A Case Study," *2019 IEEE PES Innovative Smart Grid Technologies Asia (ISGT Asia)*, Chengdu, China, 21-24 May 2019.
- P Bala Sai Kiran and Naran Pindoriya, "Centralized Demand Response Framework of an Aggregator under Uncertainty" *2019 IEEE PES Innovative Smart Grid Technologies Asia (ISGT Asia)*, Chengdu, China, 21-24 May 2019.

Patents filed:

A Universal IoT-based Smart Energy Management Device (Patent Application No.: 202221028935 dated 19.05.2022)

Books Published /Chapters contributed

- Shivashankar Sukumar, Naran M. Pindoriya, and Sri Niwas Singh, book chapter on “Short-Term Solar PV Generation Forecast Using Neural Networks and Deep Learning Models”, in Fundamentals and Innovations in Solar Energy, Springer, 2021.
- Kalpesh Joshi, Naran M. Pindoriya, and Anurag Srivastava, book chapter on “Evaluation of multiple storage benefits and optimization of energy storage operations in distribution networks” in Battery Storage at Different Grid Levels – Technology, Integration, and Market Aspects, Institution of Engineering & Technology (IET), 2018, ISBN: 978-1-78561-349-4
- Kalpesh Joshi and Naran M. Pindoriya, book chapter on “Integration of PV generation in unbalanced distribution network” in handbook of Distributed Generation, Springer International Publishing, 2017, ISBN: 978-3-319-51343-0
- Rajasekhar Batchu, Kalpesh Joshi, and Naran M. Pindoriya, Book chapter on “Integration of Distributed Renewable Energy Generation with Customer-end Energy Management System for Effective Smart Distribution Grid Operation” in edited book titled “The Water-Food-Energy Nexus: Processes, Technologies and Challenges”, CRC Press, 2017, ISBN: 9781498760836.
- Rajasekhar Batchu and Naran M. Pindoriya, Book chapter on “Residential Demand Response Algorithms: State-of-the-Art, Key Issues and Challenges”, in book titled, Wireless and Satellite Systems, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Vol. 154, Springer International Publishing, 2015.
- Naran M. Pindoriya, Dipankar Dasgupta, Dipti Srinivasan, Marco Carvalho, “Infrastructure Security for Smart Electric Grid: A Survey”, A book chapter in Optimization and Security Challenges in Smart Power Grid, Springer International Publishing, 2013.

Outreach and Professional Activities:

I am actively involved in *professional and outreach activities viz. organizing the training programs/energy awareness workshops* for power and energy industry professionals viz. GUVNL, MSME industries in Gujarat, and organizing the conferences - to disseminate the domain knowledge to the academic communities and industry professionals.

- Training program on "AI/ML Applications in Power Sector" for the officers of the [Gujarat Urja Vikas Nigam Ltd \(GUVNL\)](#) and its subsidiary companies during August 21-25, 2023 at IIT Gandhinagar.
- Organised the training program on “Regulatory Framework in Power Sector” for the officers of [GUVNL](#) and its subsidiary companies at IIT Gandhinagar during February 20-22, 2023.
- Organised the industry workshop-cum-seminar on "Energy Efficiency and Conservation in MSMEs", on January 12, 2023 at IIT Gandhinagar, enlightened the audience on the energy conservation measures and saving the monetary losses in the local Micro, Small & Medium Enterprises (MSMEs).
- Organised the two-week residential training program on “System Operation and Commercial Aspects of Power Purchase, Open Access, & Energy Accounting” for the officers of [GUVNL](#) and its subsidiary companies at IIT Gandhinagar during June 27-July 8, 2022.
- A short-term training program on "Renewable Energy Future and Flexibility" was organised by me and Prof Anand Kumar, during September 22-24, 2021 (online)

- Organizing Chair, [21st National Power Systems Conference \(NPSC 2020\)](#) organised by IIT Gandhinagar during Dec 17-19 Dec 2020. The NPSC 2020 conference featured 14 Keynote talks, Two dedicated industry-academia panel sessions, Four tutorial sessions, and 132 technical paper presentations. The conference was technically supported by the IEEE Industry Applications Society (IAS), IEEE Gujarat Section, and Power & Energy Society (PES) Gujarat Chapter, and sponsored by POWERGRID, POSOCO, ENPHASE, and OPAL-RT Technologies.
- Co-organizer, DST-UKIERI project workshop/webinar on “*Intelligent Energy Management for Environmentally Sustainable Energy Access*”, held on March 31, 2021.

Professional Activities

- Member, Research Advisory Committee, [Electrical Research and Development Association \(ERDA\)](#), Vadodara, 2017 - till date.
- Member, technical expert group to conduct a comprehensive study of technical parameters for the grid connectivity of renewable energy plants, March 2023
- Member, Pre-screening committee of [POSOCO Power System Award \(PPSA\)](#), 2020-2022.
- Member, Technical program committee (Academia), IEEE 22nd National Power Systems conference 2022 (NPSC 2022), IIT Delhi, December 17-19, 2022.
- National Advisory Committee (Academia), 9th International Conference on Power Systems 2021 (ICPS 2021), IIT Kharagpur, December 16-18, 2021.
- Senior member of the IEEE and member of IEEE Power & Energy Society (since 10 years), member of IEEE Industrial Electronics Society (since 4 years) and IEEE Industry Applications Society (since 3 years)
- Fellow of the Institution of Engineers (India)
- Fellow, The Institution of Electronics and Telecommunication Engineers (IETE)