

BIO-DATA

A. Personal Information:

- **Name:** Dr. Gururaj Mirle Vishwanath
- **Date of Birth:** 08/02/1987
- **Email:** gururajmv@iitk.ac.in
- **Academic Qualification (in reverse chronological order)**

University/Institution	Specialization	Degree/Year
IIT Roorkee	Ph.D in Power Systems	2020
NITK Surathkal	M.Tech (Research) in Power and Energy Systems	2015
VTU, Belgaum	B.E in Electrical and Electronics	2009

- **Academic Work experience (in reverse chronological order)**

Position	Division/ Department	University/ Institution	From (Month Year)	To (Month Year)
Assistant Professor Grade I	Electrical Engineering	IIT Kanpur	April 2023	Till Date
Assistant Professor Grade II	Electrical Engineering	IIT Kanpur	Oct 2021	April 2023
Research Associate	UI-ASSIST Project	IIT Roorkee	Feb 2021	Sept 2021

B. Teaching:

Sl No	Name of the Course	Sem/Year	UG/PG	Existing/New
1	Economic Operations and Control of Power Systems (EE 632A)	2021-2022, Sem 2	PG	Existing
2	Introduction to Electrical Engineering (ESO 203P)	2021-2022 Sem 3 (Summer)	UG	Existing
3	Power Systems (EE 330A) Overall Coordinator	2022-2023 Sem 1	UG	Existing
4	Modern Power Systems Operations and Control (EE 630A)	2022-2023 Sem 2	PG	Existing
5	Practical Ethics (ETH 111)	2022-2023 Sem 2	UG	Existing
6	Economic Operations and Control of Power Systems (EE 632A)	2023-2024 Sem 1	PG	Existing

7	Introduction to Electrical Engineering (ESO 203): Overall Coordinator	2023-2024 Sem 2	UG	Existing
8	HVDC Transmission and FACTS (EE 635)	2024-2025 Sem1	PG	Existing
9	Electrical Engineering PG Seminar Course (EE 801)	2024-2025 Sem1	PG	Existing
10	Design Operation and Control of Microgrids	2024-2025 Sem 2	PG	New (Received Commemorate from the Director for Teaching Exceptionally Good)
11	Introduction to Electrical Engineering (ESO 203): Overall Coordinator	2024-2025 Sem 3	UG	Existing
12	Simulation Study of Power System with Microgrid	2025-2026 Sem 1	PG	New
13	Design Operation and Control of Microgrids	2025-2026 Sem 2	PG	Existing

C. Supervision of Bachelor's/Master's thesis:

M.Tech: 14 (6 Completed)

Sl No	Name of the student	Enrolment No	Thesis Status	Thesis Title	Joint Supervisors	Publications
1	Ravikant	20104101	Degree Awarded	Design and Development of grid connected solar-wind system with charging station for electric vehicles.	Nil	2 Conference
2	Vishnu Vardhan Gurralla	22104139	Degree Awarded	Short-Term Load Forecasting for Indian Railways Using Machine Learning Models	Nil	1 Conference
3	Sidhi Vishnu Vardhana Chary	22104103	Degree Awarded	Hardware Implementation and Validation of Suitable Control Algorithms to Improve Power Quality of a PV-Integrated Distribution System	Dr Ankush Sharma	1 Conference
4	Dannapaneni Sandeep Saikumar	22104132	Degree Awarded	Optimizing Solar and Wind Power Predictions Using AI - A Study on EMD, Seasonality, Hybrid	Nil	2 Conference

				Models and Hardware Implementation		
5	Sandeep Patwa	21104088	Degree Awarded	Design and Evaluation of a Bridgeless Buck Converter for Enhanced Power Factor Correction in Electric Vehicle Charging Infrastructure	Nil	1 Conference
6	Prachetha Singh	231040078	Defense Completed	Minimizing circulating current in grid connected battery charging system	Dr Swathi Battula	Nil
7	Swathi Gupta	231040115	Thesis work under progress	Operation of three phase grid connected and islanded PV battery system	Dr Swathi Battula	Nil
8	Aritra Patra	231040025	Thesis work under progress	Power Quality Issues and DC Microgrid Operation and Control	Dr Abheejeet Mohapatra	Nil
9	Naresh Kumar Saini	241040051	Thesis work under progress	Energy Management and operation and control of the Microgrid: Simulation and Hardware	Nil	Nil
10	Ashok Meena	241040011	Thesis work under progress	Energy Management and operation and control of the Microgrid: Simulation and Hardware	Dr Ankush Sharma	Nil
11	Praveen	241290013	Thesis work under progress	Smart Metering	Dr Prabodh Bajapai	Nil
12	Aniket Singh		On semester leave		Dr Amarendra Edpuganti	Nil
13	Sunny Kumar Shivam	251040116	Course Work Under Progress			
14	Udaybhan Yadav	251040120	Course Work Under Progress			

MSR: 01 (Completed)

Sl No	Name of the student	Enrolment No	Thesis Status	Thesis Title	Joint Supervisors	Publications
1	Prince	21104407	Thesis Defended	Modified bridgeless boost pfc converter of ev charging applications.	Nil	1 Journal, 1 Conference (Received POSOCO Power System Award-2026)

D. PhD Supervision:

Ph.D: 08 (Ongoing+Completed)

Sl No	Name of the student	Enrolment No	Thesis Status	Thesis Title	Joint Supervisors	Publications
1	Mayank Arora	21104265	Thesis Successfully Defended on 08/12/2025 (Graduated)	A Resilient and Secure Framework for Energy Pricing and Peer-to-Peer Trading in Smart Grid Environment.	Dr Ankush Sharma and Dr Naveen Chilamkurti (La-Trobe University)	6 Journals, 5 Conferences, 1 Book Chapter.
2	Jitendra Kumar Mahawar	20104284	Thesis Submitted on 30/01/2026	Enhancing The Performance of Doubly Fed Induction Generator Under Grid Disturbances	Dr Saikat Chakrabarti	2 Journals, 4 Conferences
3	Diksha Singh	19104266	Open Seminar Conducted on 17/04/2026	Opportunities and Challenges of EV integration to the grid.	Dr Laxmidhar Behera,	1 Journal, 05 Conference
4	Mukesh Maurya	21204265	SOTA Completed	Study on PV and grid interactive EV charging station	Nil	02 Conference
5	Arpan Gayen	22104265	SOTA Completed	Load Redistribution Attack Modelling in Power System	Dr Tushar Sandhan, Dr Naveen M Chilamkurti and Dr Abdun Mahmood	1 Conference
6	Krishnakant	22229262	SOTA Completed	Optimal Planning and Control of Multi-Energy Vector based Microgrid	Dr Prabodh Bajapai	Nil

7	Amit Kumar	232040603	Comprehensive Completed	Performance Investigation of the Inverter under diversified operating conditions	Dr Ebin Cherian Matthew	Nil
8	Nishant Saxena	251040626	Course Work is ongoing	Microgrid and its interfacing challenges with the grid.	Dr Ankush Sharma, Dr Naveen Chilamkurti and Dr Abdun Mahmood (La-Trobe University)	Nil

E. Knowledge Dissemination:

- **Book Chapters:**

1) Arora, M., **Vishwanath, G.M.**, Sharma, A., Chilamkurthi, N. (2025). Maximizing Customer Satisfaction and Grid Resilience Through a Three-Tiered Energy Bidding Framework. In: Kalam, A., Mekhilef, S., Williamson, S.S. (eds) Innovations in Electrical and Electronics Engineering. ICEEE 2024. Lecture Notes in Electrical Engineering, vol 1294, pp 251–265, Springer, Singapore. https://doi.org/10.1007/978-981-97-9037-1_18.

- **Online Courses:**

Sl No	Name of the course	Scheme	Number of Students Registered	Number of Students Appeared for Exam/Certified	Year
1	Economic Operations and Control of Power Systems	NPTEL/SWAYAM	4300	1223/458	2023-2026
2	Power Sector Regulation, Economics and Management	E-Masters/ IITK			2022-2025
3	Smart Grid	E Masters/IITK			2024-2025
4	We-Power-SAR100	Online Education for the SAARC Women from Asian Countries	More than 50	NA	2024-2025

- **Workshops Conducted/Scheduled (Funds Received: 30+ Lakhs): 07.**

- 1) **Chair of the IEEE UPCON Conference** to be held at IIT Kanpur **from 19th to 21st December 2026.**
- 2) **As a chair organized SPARC Project (MHRD) Funded Workshop** on the topic “Grid Resilience in the Era of Mass EV Adoption”, **12th-14th Jan 2026 at IIT Kanpur.** Overall, 40 participants benefited. International experts were invited to deliver technical talks; panel discussions were held with Industry experts.
- 3) **As a Co-chair organized the LIFE Conference SANKET** Sustainability through Ancient Knowledge and Emerging Technologies **on 13th Dec 2025 at IIT Bombay** with over 100 participants and

speakers from industry, academia, and sustainable practitioners.

- 4) **As a chair organized** the 6th Edition of the IEEE PES R10 Meet and Greet Event and the **Two-Day IEEE PES R10 Global Workshop 2025** on the topic “The Role of AI In achieving the net zero” held during **May 30 and 31st 2025 at KIIT University Bhubaneswar**. Around 80 participants took part in the event.
- 5) **As a chair of** IEEE PES Chapter UP section and IEEE Student Branch Chapter (SBC) IIT Kanpur organized the **"Empowering a Sustainable Future: Resilient Renewable Energy and Electric Mobility" under the flagship event (Power Engineering Research Application (PERA))** workshop from **Nov 29th to Dec 1st 2024**. Over 100 Participants took part in the workshop, with 15 technical sessions, panel discussions and industry super sessions were also held. Field visit was the highlight of the workshop. **Received sponsorship from TMEIC India, UPNEDA, IEEE UP Section, RTDS, Typhoon HIL, Entuple Technologies, Baud Resources, IEEE YP and HIOKI**. This workshop was a grand success and **was flagged as an event of the month in the IEEE PES R10 region**.
- 6) **As a chair organized I-metro Sponsored Workshop** for “Transition of Indian Metros: Automated, Intelligent, and Sustainable Solutions for Energy Savings” from **July 3rd to 5th, 2024**. **The approved fee is Rs.19.0 Lakhs, 23 Participants participated. We Received appreciation from I-Metro** for the successful organization of the workshop.
- 7) **As a Co-chair organized the LIFE Conference “Bharatiya Perspective on Sustainability” in National Stock Exchange, Bombay on 27th November 2024. Chief Guest: Shri C.P Radha Krishnan - Governor of Maharashtra, Shri Shri S Gurumurthy - CA, Corporate & Legal Advisor.**

• **Technical Talks Delivered/Scheduled (30+):**

- 1) Delivered talk on “Design Operation and Control of DC Microgrids” in the FDP on “Energy Management in DC Microgrid for EV Charging Infrastructure” organized by MNIT Jaipur on 18.02.2026.
- 2) Delivered Talk on “The Role of Electric Vehicles in enhancing resilience of the modern power system” Grid Resilience in the Era of Mass EV Adoption: A Technical Workshop" Organized during 12th-13th January 2026 at IIT Kanpur.
- 3) Took part in the industry–Academia Leadership Roundtable at PCIM India Conference 9-10 Dec 2025.
- 4) Delivered Talk on “AI Applications to Power Systems” at the ICEA conference held in Melbourne on 03-05 December 2025.
- 5) Expert Speaker for Webinar on “Opportunities and Challenges in New Markets for Offshore Wind” for SAARC Energy Centre, Islamabad, Pakistan scheduled on 1st Dec 2025.
- 6) Delivered Technical Talk on “Renewable Energy and Electric Vehicles”, Organized by PESCE, Mandya on 17th Oct 2025.
- 7) Delivered online talk titled “Resiliency improvement using renewables and EV” in the FDP "Grid Resilience and Adaptive Control Evolution in Power Systems (GRACE-PS-2025)" jointly organized by NIT Patna & MNNIT Allahabad on 12th Oct 2025.
- 8) Delivered Technical Talk on the topic “DC Microgrid: Design, Operation and Control” in ANRF Sponsored 5 Days Symposium RICO-2025, at NIT Jalandhar on Sept 25th 2025.
- 9) Delivered Technical Talk on the topic “Real Time Studies of Microgrid”, in the “Smart Grid Resilience: Integration of Inverter-Based RESs, EVs, and Cybersecurity Measures (SGIEC 2025)”, organized by the Department of Electrical and Electronics Engineering, National Institute of Technology, Tiruchirappalli, Tamil Nadu, on Sept 9th 2025.
- 10) Delivered Online Technical Talk on “Achieving Net Zero: Role of of AI” during the two weeks online Faculty Development Programme on “AI and EV Synergy: Driving the Evolution of Next-Gen Smart Energy Systems (AI-EVS-2025)” organized by Electronics & ICT Academy, NIT Patna and NIT Agartala, on July 14th 2025.

- 11) Delivered online talk on the topic “Resilience Enhancement of the modern power system with renewable and EVs” along with the Lab session Titled: Operation and control of Micro-grid in the (FDP) on "Application of AI in Sustainable Power Systems" organized by Electrical Engineering Department, G H Rasoni College of Engineering and Management, Nagpur collaboration with E&ICT academy *IIT, Roorkee, on 11th July 2025.
- 12) Panel Member in the Session Titled “Exploring UP’s Current Energy Mix & Future Roadmap Considering the USD 1 Trillion target”, during clean energy summit 2025 organized by CII at Lucknow on 8th July 2025.
- 13) Delivered expert talk on the topic “Modelling and Control of Power Electronic Converters for Green Energy Applications” talk in the Online Faculty Development Programme (FDP) on "Modelling and Control of Power Electronic Converters for Green Energy Applications", Organized by MNIT Jaipur, on June 23rd 2025.
- 14) Delivered Invited Lecture on the topic “Transition towards Net Zero: Role of AI” at JSS STU, Mysuru on June 19th 2025.
- 15) Delivered the Talk on the topic, " Role of AI in Renewable and Load Forecasting during the 6th Edition of the IEEE PES R10 Meet and Greet IEEE PES R10 Global Workshop 2025 with the Theme, "The Role of AI and Storage in Achieving Net Zero” at KIIT Bhubaneswar, Organized by IEEE Bhubaneswar Section and IEEE UP Section on May 30th 2025.
- 16) Delivered a practicum session on the topic “Real Time Study on Transmission and Distribution models with the Renewable Energy, Module 3 on Planning, Design, and Operation of Integrated Power organized by AIT Thailand for WePOWER SAR100-2.0 on Jan 2025.
- 17) Panel Member in the Student Young Professional (SYP) Panel Discussion titled "Fireside Chat on Career Guidance with Young Professionals," during PEDES 2024 held at National Institute of Technology Karnataka on December 19, 2024.
- 18) Delivered talk titled “Real Time Studies on Resilience Improvement using Renewables and EVs” in the Power Energy Research Applications (PERA-2024) workshop “Empowering a Sustainable Future: Resilient Renewable Energy and Electric Mobility” held at IIT Kanpur on 29th Nov 2024.
- 19) Delivered online Lecture on "EV and Renewable Penetration challenges to the Distribution System" for workshop on Energy Conservation & Sustainable Development (ECSD-23), 18th December 2023, Organized by NIT Kurukshetra.
- 20) Delivered Lecture on “Outage Resilient Peer-to-Peer Energy Trading in Smart Grids using Transactive Energy and Blockchain Technology” at La-Trobe University, Melbourne, Australia on 27th Nov 2023.
- 21) Delivered Lecture on “Case Studies on Renewable and EV Integration Issues with the Distribution Systems on 10th Oct 2023, NIT Kurukshetra.
- 22) Delivered online talks on the topic “Unit commitment & economic dispatch” as part of the curriculum teaching on the WePower-SAR100 Programme for the SAR100, Organized by AIT Thailand during 13th Sept 2023.
- 23) Delivered Lecture on a Panel Session Utility Scale Demonstrations: Lessons Learned from US-India Joint UI-ASSIST Project on topic “A Semi Urban IIT Kanpur Campus Microgrid Demonstrations” July 20th 2023, Orlando, Florida, USA.
- 24) Invited Speaker on the topic “Power Converters for EV and Its Applications” on 19th June 2023, organized by NSRIT, Visakhapatnam, India.
- 25) Invited Speaker on the topic “Applications of Power Electronics in the field of Renewables and EVs: Real Time Studies” on 20th June 2023, organized by HBTI, Kanpur India.
- 26) Invited Speaker on the topic “Wind and Solar based Power Systems” on 29th April 2023, Organized by IIT Kanpur in support of PFC and UI-ASSIST Project.
- 27) Invited Speaker on the topic “Future Power System in the Presence of Renewables and EV” on 29th March 2023” organized by BMSCE, Bangalore.

- 28) Guest Speaker at Alliance University, Bangalore on the topic "The Role of AI in Modern Power Engineering on 11th March 2023".
- 29) Invited Expert Lecture on Topic "Issues Associated with Greener Power System and E-Transportations", Short Term Course Organized by SVNIT Surat on 24th Feb 2023.
- 30) Guest Speaker on topic "Renewable and EV Integration Issues with the Power Systems" in FDP Organized by Reva College of Engineering Bangalore, 07th Feb 2023.
- 31) Guest Speaker in PERA 2022 hosted by IEEE SBC IIT Kanpur on topic "Moving towards sustainable and Resilient Power Systems: Challenges and Case studies", 17th Oct 2022, IIT Kanpur.
- 32) Guest Speaker at the UP-Power Conclave 2022 on Topic "Machine Learning Applications in Distribution Sector" on 10th August 2022.
- 33) Delivered Lecture on a Panel Session Asian and Australian Experiences on topic "Rural Microgrid Modelling, Simulation and Operation" July 19th 2022, Denver USA.
- 34) Delivered Expert Talk during Training Program Intelligent Power Transmission and Distribution Systems on topic "EV Integration Challenges to Power Systems", 19th May 2022, IIT Kanpur.
- 35) Expert Talk Delivered on "PHIL Experimentation" to IIT Jammu on 06th April 2022.
- 36) Delivered Talk on IEEE Webinar Invite on topic "EV Challenges when Interfaced with Power System", 16th March 2022, IIT Mandi.
- 37) Delivered Talk on "EV Challenges: Power System Perspective" for an ATAL FDP on Electric Charging Station for Vehicles organized by Government college of Engineering Thrissur, during 25th Feb 2022.
- 38) Delivered Talk on "Real Time Case studies on Distribution System Automation with Renewable Energy Systems Integrated with the Grid" for an online Expert session organized by NITK, Surathkal on 31st Dec 2021.

F. Publications (Journals 16, Conference 39, Patent 1): (Total: 56) (Highlighted are those published after joining IIT Kanpur)

Journals (16):

- 1) J. K. Mahawar, G. M. Vishwanath and S. Chakrabarti, "Enhancing Performance of Doubly Fed Induction Generator Under Unbalanced Voltage," in **IEEE Transactions on Industry Applications**, doi: 10.1109/TIA.2026.3679657, 2026.
- 2) M. Arora, G. M. Vishwanath, A. Sharma, and N. Chilamkurti, "Blockchain-enabled secure energy trading in smart home devices," **Electric Power Systems Research (Elsevier)**, Volume 258, 2026, 113113, ISSN 0378-7796, <https://doi.org/10.1016/j.epsr.2026.113113>, in press, 2026.
- 3) Diksha Singh, Laxmidhar Behera, Gururaj Mirle Vishwanath, "Behavior-driven planning of community energy storage with dynamic EV support for distribution system resilience, **Electric Power Systems Research (Elsevier)**, Volume 257, 2026, 112989, ISSN 0378-7796, <https://doi.org/10.1016/j.epsr.2026.112989>.
- 4) Mayank Arora, Gururaj Mirle Vishwanath, Ankush Sharma, Naveen Chilamkurti, "Incentive model for fair and resilient peer-to-peer energy trading based on the time value of money", **Utilities Policy (Elsevier)**, Volume 99, 2026, 102122, ISSN 0957-1787, <https://doi.org/10.1016/j.jup.2025.102122>.
- 5) M. Arora, G. M. Vishwanath, A. Sharma and N. Chilamkurti, "Peer-to-Peer Energy Trading Framework Using Markov Chain for a Resilient Smart Grid," in **IEEE Transactions on Industry Applications**, vol. 61, no. 3, pp. 4499-4514, May-June 2025. DOI: 10.1109/TIA.2025.3549002.
- 6) J. K. Mahawar, M. Sehwat, G. M. Vishwanath and S. Chakrabarti, "Multi-Target Control Technique for DFIG Under Unbalanced Voltage," in **IEEE Transactions on Energy Conversion**, vol. 40, no. 3, pp. 2022-2035, Sept. 2025, doi: 10.1109/TEC.2025.3539425.

- 7) Mayank Arora, Gururaj Mirle Vishwanath, Ankush Sharma, Naveen Chilamkurti, "Adaptive ensemble learning for real-time detection of price manipulation attacks on smart meters", Sustainable Energy, Grids and Networks (**Elsevier**), Volume 43, 2025, 101881, ISSN 2352-4677, <https://doi.org/10.1016/j.segan.2025.101881>.
- 8) Mayank Arora, Gururaj Mirle Vishwanath, Ankush Sharma, Naveen Chilamkurti, "A novel congestion based pricing model for prosumer-centric smart grid systems", **Electric Power Systems Research (Elsevier)**, Volume 247, 2025, 111732, ISSN 0378-7796, <https://doi.org/10.1016/j.epsr.2025.111732>.
- 9) M. Arora, G. M. Vishwanath, A. Sharma and N. Chilamkurti, "A Novel Price Discovery Insurance Scheme for Outage Resilient Energy Management System," in **IEEE Transactions on Industry Applications**, vol. 60, no. 2, pp. 1986-2001, March-April 2024. doi: 10.1109/TIA.2023.3339471.
- 10) P. Dadhaniya, M. Maurya and G. M. Vishwanath, "A Bridgeless Modified Boost Converter to Improve Power Factor in EV Battery Charging Applications," in **IEEE Journal of Emerging and Selected Topics in Industrial Electronics**, vol. 5, no. 2, pp. 553-564, April 2024.
- 11) Ilgiz Murzakhanova, Gururaj Mirle Vishwanath, Kasi Vemalaiah, Garima Prashal, Spyros Chatzivasileiadis, Narayana Prasad Padhy, "A Novel Decentralized Inverter Control Algorithm for Loss Minimization and LVRT Improvement", **Electric Power Systems Research (Elsevier)**, Volume 221, 2023, 109433, ISSN 0378-7796, <https://doi.org/10.1016/j.epsr.2023.109433>.
- 12) A. K. Mishra, A. K. Singh and G. M. Vishwanath, "A Fuel-Efficient BLDC Motor-Driven Light Electric Vehicle With Single-Stage Onboard Charging System," in **IEEE Transactions on Transportation Electrification**, vol. 9, no. 4, pp. 4909-4921, Dec. 2023, doi: 10.1109/TTE.2022.3226536.
- 13) M. V. Gururaj and Narayana Prasad Padhy, "PHIL Experimentation on Fault Ride Through Behavior of Doubly Fed Induction Generator-Based Wind System in the Presence of Fault Current Limiter," in **IEEE Transactions on Industry Applications**, Vol. 56, no. 3, pp. 2988-3005, May-June 2020.
- 14) M. V. Gururaj and Narayana Prasad Padhy "A Cost-Effective Single Architecture to Operate DC Microgrid Interfaced DFIG Wind System During Grid Connected, Fault and Isolated Conditions", **IEEE Transactions on Industry Applications**, Vol. 16, no. 2, pp. 922-934, Feb 2020.
- 15) M. V. Gururaj and Narayana Prasad Padhy "An Improved Coordinated Voltage Control Scheme for Better Utilization of Regulating Devices During Various Operating Conditions of a Distribution System", **IEEE Systems Journal**, Vol. 14, no. 4, pp. 4891- 4900, Dec 2020.
- 16) M. V. Gururaj and Narayana Prasad Padhy "A Novel Master/Slave Based Decentralized Coordinated Voltage Control Scheme for Medium Voltage DC Microgrid", **IEEE Transaction on Industrial Informatics**, Vol. 14, No. 5, pp. 1962-1973, May 2018.

Conferences (39)

- 1) Jitendra Kumar Mahawar, Gururaj Mirle Vishwanath, Saikat Chakrabarti, "Multi-Target Control Technique for DFIG Under Unbalanced Voltage", **Accepted for presentation in IEEE PES General Meeting 2026** to be held during July 19-23, Montreal Canada.
- 2) D. Singh, M. Maurya, L. Behera and G. M. Vishwanath, "A Unique Power Management Scheme for Improving the Performance of Distribution Transformer Using Electric Vehicles" 6th IEEE International Conference on Electric Power and Renewable Energy (EPEC-2026), IIT Bhilai, India, 2nd - 4th January 2026. (**Received Best Paper Award**).
- 3) M Maurya, B Diana, and Gururaj M V, "Observer-Based Sliding Mode Control for Three-Level ANPC Converters," 2025 IEEE International Conference on Energy Technologies for Future Grids (ETFG), Wollongong, Australia, 2025, pp. 1-6.

- 4) Jitendra Kumar Mahawar, **Gururaj Mirle Vishwanath**, Saikat Chakrabarti, "Hardware in Loop Validation for DFIG Control under Normal and Abnormal Grid Conditions" 2025 IEEE International Conference on Energy Technologies for Future Grids (IEEE ETFG 2025), Accepted on 19 July 2025.
- 5) M. Arora, **G. M. Vishwanath**, A. Sharma, and N. Chilamkurti, "A Novel PoEAC Consensus Mechanism for Decentralized Energy Trading Systems," accepted in the 8th International Conference on Electrical, Communication and Computer Engineering (ICECCE), 27-28 August 2025, Istanbul, Turkey.
- 6) M. Arora, **G. M. Vishwanath**, A. Sharma, and N. Chilamkurti, "Incorporating Hedonistic Motivations in Peer-to-Peer Energy Trading to Enhance Consumer Engagement and Market Efficiency," accepted in the 2025 IEEE International Conference on Energy Technologies for Future Grids, ETFG-2025.
- 7) Diksha Singh, **Gururaj M.V.** and L. Behera, "A Unique MISOCPP Approach for Electric Vehicle Centric Distribution System Expansion," 2025 IEEE Sustainable Energy and Future Electric Transportation (SEFET), Jaipur, India, 9-12 July 2025.
- 8) Jitendra Kumar Mahawar, **Gururaj Mirle Vishwanath**, and Saikat Chakrabarti "A Study of Startup and Synchronization Process of DFIG using Experimental Setup", 2025 IEEE International Conference on Sustainable Energy and Future Electric transportation (SEFET), Jaipur, India, 9-12 July 2025.
- 9) Arpan Gayen, Naveen Chilamkurti, **Gururaj M.V.**, "A novel Load redistribution attack detection algorithm using hellinger distance and power transfer distribution factor," 2025 IEEE Sustainable Energy and Future Electric Transportation (SEFET), Jaipur, India, 9-12 July 2025.
- 10) Mukesh Maurya, Abhishek Sharma, **Gururaj M V**, "Initial Set Point Prediction of Adaptive PI Controller using Machine Learning Algorithm ," 2025 ECCE Asia Bangalore , India, 11-14 May 2025, pp. 1-6, ECCE Asia.
- 11) Jitendra Kumar Mahawar, **Gururaj Mirle Vishwanath**, and Saikat Chakrabarti "Transient Stability Enhancement of a Synchronous Generator Using DFIG Considering its LVRT Capability", 2024 IEEE International Conference on Power Electronics Drives and Energy Systems (PEDES), NIT Karnataka, Surathkal, India, December 18-21, 2024.
- 12) Vishnu Vardhan Gurralla, Diksha Singh, Abhishek Sharma, **Gururaj M V**, "Short-Term Load Forecasting For Indian Railways Using Seasonal-Trend Decomposition" has been accepted for presentation in 23rd National Power Systems Conference (NPSC) 2024, Indore, December 14th to 16th 2024, IIT Indore, India.
- 13) Mayank Arora, **Gururaj M V**, N Chilamkurti, "Optimizing Fairness in Peer-to-Peer Energy Systems for Effective Duck Curve Management", National Power System Conference (NPSC), IT Indore India, in 23rd National Power Systems Conference (NPSC) 2024, Indore, December 14th to 16th 2024, IIT Indore, India.
- 14) M. Arora, **G. M. Vishwanath**, A. Sharma and N. Chilamkurti, "A Novel Approach to Sustainable Energy Trading Optimizing Prosumer Incentives and Carbon Footprint," 2024 13th International Conference on Renewable Energy Research and Applications (ICRERA), Nagasaki, Japan, 2024, pp. 1022-1027, <https://doi.org/10.1109/ICRERA62673.2024.10815200>.
- 15) Sidhi Vishnu Vardhana Chary, M Maurya, Manoj Kumar Behera, Ankush Sharma, **Gururaj M V** "Hardware Implementation and Validation of Suitable Control Algorithms to Improve Power Quality of a PV-Integrated Distribution System," 2024 IEEE 11th Power India International Conference (PIICON), Jaipur, India, 10th to 12th December 2024, pp. 1-6.
- 16) D. Singh, L. Behera, and **G. M. Vishwanath**, "Optimal Mobile Power Source Depot Placement for Resilient Coupled Power Transport Networks," 2024 IEEE Innovative Smart Grid Technologies - Asia (ISGT Asia), Bangalore, India, Nov. 10-13, 2024.

- 17) Dannapaneni Sandeep, Abhishek Sharma, Mukesh Maurya, Vishnu Vardhan Chary, **Gururaj M V**, "Boosting Solar Load Forecasting Using Artificial Intelligence and Hardware Prototype" 2024 IEEE 5th International Conference on Sustainable Energy and Future Electric Transportation (SEFET), 09 July - 12 July, 2024, Hyderabad.
- 18) V. V. Gurrula, A. Sharma and **G. M. Vishwanath**, "Short-Term Load Forecasting for Indian Railways Using Machine Learning Models," 2024 IEEE Students Conference on Engineering and Systems (SCES), Prayagraj, India, 2024, pp. 1-6, doi: 10.1109/SCES61914.2024.10652452.
- 19) Dannapaneni Sandeep Saikumar, Vishnu Vardhan Gurrula, **Gururaj Mirle Vishwanath**, Ankush Sharma, Tushar Sandhan, "Forecasting Air Pollutant Concentrations using Time-series Data from the Vicinity of Coalmines", SEGTECH 11th Dec 2023, Vietnam.
- 20) D. Singh, **G. M. Vishwanath**, and L. Behera, "Resilience-Driven Distribution Network Optimization with BESS and EV Integration," 2023 IEEE International Conference on Energy Technologies for Future Grids (ETFG), Wollongong, Australia, 3-6 December 2023, pp. 1-6, doi: 10.1109/ETFG55873.2023.10407786.
- 21) Jitendra Kumar Mahawar, **Gururaj Mirle Vishwanath**, and Saikat Chakrabarti "LVRT Capability Enhancement of Doubly-Fed Induction Generator using Multi-Stage Control", 2023 10th IEEE International Conference on Power Systems (ICPS), Cox's Bazar, Bangladesh, accepted on Nov 9, 2023.
- 22) A. K. Singh, A. K. Mishra and **G. M. Vishwanath**, "A Bidirectional DC-DC Converter for Supercapacitor Assisted EVs," 2023 7th International Conference on Computer Applications in Electrical Engineering-Recent Advances (CERA), Roorkee, Oct 27-29, IIT Roorkee, India, 2023, pp. 1-6.
- 23) Arora, Mayank, **M. V. Gururaj**, Ankush Sharma, and Naveen Chilamkurti. "Enhancing Peer-to-Peer Energy Trading Efficiency and Fairness Through a Hybrid Auction Mechanism in Decentralized Smart Grids." In IECON 2023-49th Annual Conference of the IEEE Industrial Electronics Society, pp. 1-6. IEEE, Oct 16-19 2023.
- 24) Prince Dhadaniya, **Gururaj Mirle Vishwanath**, Ankush Sharma "Modified Isolated Bridgeless SEPIC PFC Converter for EV Battery Applications" Accepted in IEEE 2nd International Conference On Smart Technologies For Smart Nations (SmartTechCon 2023), 19-21 August 2023, Singapore.
- 25) Sandeep Patwa, **Gururaj Mirle Vishwanath**, Ankush Sharma, "A Modified Buck Converter with Bridgeless configuration to achieve Power Factor Correction for suitable for EV application" Accepted in IEEE 2nd International Conference On Smart Technologies For Smart Nations (SmartTechCon 2023), 19-21 August 2023, Singapore.
- 26) Diksha Singh, Mukesh Maurya, **M V Gururaj**, L Behera, "A Unique Energy Management Scheme for Harnessing Electric Vehicle Potential to Improve Grid Resiliency" IEEE PES General Meeting 2023, 16-20 July, Florida, USA.
- 27) Ravikant Yadav, Mukesh Maurya, **M.V. Gururaj**, "Implementation of a Solar-Wind hybrid Charging Station For Electric Vehicles", Accepted in IEEE PES General Meeting 2023, to be presented 16-20 July, Florida, USA.
- 28) Subho Paul, **Gururaj Mirle Vishwanath**, Narayana Prasad Padhy, "A New Iterative Mixed Integer Linear Programming Algorithm for Energy Management in Active Unbalanced Distribution Networks", IEEE PES General Meeting 2023, 16-20 July, Florida, USA.
- 29) Ravikant Yadav, Mukesh Maurya, **M.V. Gururaj**, "Implementation of grid connected solar-wind system with charging station for electric vehicles, IEEE PEDES, Dec 14-17 2022, MNIT Jaipur.
- 30) Mayank Arora, **M V Gururaj**, Ankush Sharma, "Simulation of Parallel-Series Converter in Open Loop and Closed Loop for Wireless Power Transfer", IEEE GUCON, September 23-25 2022, India Habitat Centre, New Delhi.

- 31) Rashmi Prasad, **Gururaj M V** and Narayana Prasad Padhy, "Frequency Regulation of PMSG Based Wind Turbine Considering Location Identification Technique in High Penetration of Renewable Generation System", IEEE PESGRE, 02-05th Jan. 2022.
- 32) **Gururaj M V**, Rashmi Prasad and Narayana Prasad Padhy, Real Time Simulations Study Upon the Impact of DFIG Interconnected DC Microgrid on the Distribution System, 2021 IEEE IAS 4th International Conference on Computing, Power and Communication Technologies (IEEE GUCON 2021), Sept. 24th 2021. (Grabbed Best paper award).
- 33) B. Krishna Chaithanya, **M V Gururaj** and Narayana Prasad Padhy, "Decentralized and Coordinated Virtual Synchronous Generator control for Hybrid AC-DC Microgrids", The IEEE International conference on "IEEE Power Electronics, Smart Grid and Renewable Energy (PESGRE 2020)" Cochin, Kerala, India.
- 34) **M. V. Gururaj**, Rashmi Prasad and Narayana Prasad Padhy, "Power Hardware in Loop Experimentation for Asymmetrical Fault Ride Through analysis of Grid Connected DFIG Wind Turbine" The IEEE International conference on "Power Electronics, Smart Grid and Renewable Energy (PESGRE 2020)" Cochin, Kerala, India.
- 35) **M. V. Gururaj** and Narayana Prasad Padhy, "Power Hardware in Loop based experimentation on DFIG wind system integrated to isolated DC microgrid", IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2018), Chennai, India.
- 36) **M. V. Gururaj** and Narayana Prasad Padhy, "Fault Ride Through Analysis of Grid Connected Doubly Fed Induction Generator Based Wind System," 2018 IEEE Power & Energy Society General Meeting (PESGM 2018), Portland, OR, USA.
- 37) **M. V. Gururaj** and Narayana Prasad Padhy, "PHIL experimentation on fault ride through behaviour of doubly fed induction generator based wind system in the presence of fault current limiter", IEEE IEEMA Engineer Infinite Conference (e-TechNxt 2018), New Delhi.
- 38) Jayasankar V N, **Gururaj M V** and Vinatha U., "A study on hybrid Renewable Energy Source interface to the non-ideal grid at distribution level with power quality improvements," 2016 IEEE 6th International Conference on Power Systems (ICPS), 2016, pp. 1-5, doi: 10.1109/ICPES.2016.7584239.
- 39) **Gururaj M V**, Vinatha U. and Jayasankar V N, "Interconnection of wind-solar hybrid Renewable Energy source to the 3 phase-3 wire distribution system along with power quality improvements at the grid side, "IEEE International Conference on Power and Advanced Control Engineering (ICPACE), 2015, pp. 168-172, doi: 10.1109/ICPACE.2015.7274937.

Patent (1):

1) **M V Gururaj**, Narayana Prasad Padhy, Bandla Krishna Chaithanya and Rashmi Prasad, Cost- Effective Isolated Operation of the DFIG wind system supported by the DC Microgrid, File no. 202011048384, 05th November 2020. Status: Granted on 05/12/2023, Patent Number is 476919.

G. Development:

- 1) **As a mentor of the Baud Resources, a start-up based out of IIT Kanpur, we have developed a Gravity-based energy storage system (GESS) that provides a fundamentally different approach to long-duration energy storage.**



Completed Milestones:

- **Vivek-1:** 30W lab prototype successfully demonstrated proof of concept
 - **Vivek-2 (TRL 7):** 0.1 kW field prototype deployed at IIT Kanpur, November 2023.
 - **Vivek-2.2 (TRL 8):** 0.2 kW field prototype **completed April-September 2025** with validated performance metrics including 65% round-trip efficiency (exceeding target), and full validation of mechanical, electrical, civil engineering functions. Power generation has been demonstrated with documented site trials.
 - **Vivek-2.3 (TRL 9):** 5 kW × 1 hr demonstration plant currently under development. This represents a 25× scale-up from the previous prototype. An MOU has been executed with the National Institute of Solar Energy (NISE) in Gurugram, securing 6 acres of land for deployment. Site development is advancing following the monsoon season.
- 2) Developed the three level ANPC control strategies which is embedded to the design and **development of the 5 MW Solar Inverter** in collaboration with the TMEIC India Ltd.
 - 3) Working on development of the Indigenous **Energy Management Solution (EMS) for the micro grid** in collaboration with the MARS Antenna Pvt Ltd.
 - 4) Developed the indigenous **AI based load forecasting for the Indian Railways** to be deployed at 14 different states. Also, AI based solar and the wind forecasting models have been developed.
 - 5) **Developed the AC-DC Hybrid Microgrid** with the renewables, the battery and the loads, with this setup the research work is carried out broadly in the areas as 1) Renewables integration challenges with the distribution system, 2) EV Integration Challenges with the Distribution System, 3) AI Application to the Power Systems.



H. Funding:

Details of Projects under implementation:

As PI: (Total Budget Sanctioned: 4.3 Crores, External Funding (3.4 Crores))

- 1) **ANRF Sponsored Project:** Developing Indigenous Gravity Energy Storage Technology (DIGEST): Integrated with advanced control features suitable for high RE penetrated Power Grid. **Budget of Rs 97.9 L (Ongoing).**
- 2) **ITES Sponsored Project:** Artificial Intelligence based Cost-Optimization in Indian Railways Minimizing Overall Carbon Emission. **Budget of Rs 92 L. (Ongoing).**
- 3) **MHRD Sponsored Project:** Resilience and Cyber Security Enhancement for an optimized Distribution System Using Block Chain. **Budget 80.78 L. (Ongoing).**
- 4) **TMEIC Industry Sponsored Project** "Development of New Gen Photovoltaic Inverter for Indian Market": **Budget Rs 50 Lakhs. (Completed).**
- 5) **MARS Antenna Pvt Ltd Industry Sponsored Project** "Design, Development, Fabrication, Testing And Integration of Smart Energy Management System (Ems) For Hybrid Micro-Grid And Scale Energy Storage Applications": **Budget Rs 17.7 Lakhs. (Ongoing).**
- 6) **IIT Kanpur Sponsorship:** Development of AC-DC hybrid microgrid based Power Hardware in the loop (PHIL) Experimentation Prototype consisting of Renewables and the Electric Vehicle to assess its impact on the Distribution Grid. **Budget of Rs 89 Lakhs. (Completed).**

As Co-PI: (Total Budget Sanctioned: 61.1 Crores)

- 7) "Grid Readiness for EV: Enablers and Technological developments (GREET), MAHA Call for proposal, by DST: PI Prof Saikat Chakrabarti. **Budget of Rs 24.81 Crores. (Ongoing).**
- 8) SERB Project: Centre For Rechargeable Energy Storage Systems For Augmenting Transportation And Electrification (Create): PI: Prof Raju Gupta. **(Budget Rs 8.45 Cr: Ongoing)**
- 9) Kotak School of Sustainability Funding: "Demand Side Management for Energy Efficient IITK Campus". PI: Prof Anubha. **(Budget Rs 41.1 Lakhs). (Ongoing)**
- 10) MARS Antenna Pvt Ltd Sponsored Project "Design, Development, Fabrication, And Testing of Smart Ev Charges And Smart Hybrid Inverters For ESS Application": PI Prof Amarendra Edpuganti. **Budget Rs 17.7 Lakhs. (Ongoing).**
- 11) UI-Assist: US India Collaborative for Smart Distribution System With Storage. PI Prof Ankush

Sharma. **(Budget 26.61 Crores: Completed)**

12) TMEIC Funding: "Next Generation UPS". Prof Suvendu Samanta. **Budget Rs 50 Lakhs. (Completed).**

13) IITK-Tandon Collaborative Project: "EMI Shielded and FOD Enabled Smart Wireless EV Charging Station Powered by Renewable Energy". PI: Prof Suvendu Samanta. **Budget Rs 15 Lakhs. (Completed).**

Survey work Carried out: Budget 17.13 Lakhs

SI No	Title	Funding Agency	Budget	Duration
1	Third-Party Inspection of Solar Street Lights and Solar High Mast Lights.	UPNEDA	6.53 Lakhs	15 Days
2	Proposal For Street Lights and Ayodhya Solar Smart City Inspection.	UPNEDA	10.6 Lakhs	15 Days

I. Peer Recognition:

- 1) **IEEE Best Paper Award-2026:** 6th IEEE International Conference on Electric Power and Renewable Energy (EPREC-2026), IIT Bhilai.
- 2) **IEEE UP Section Award-2025** IEEE Uttar Pradesh Section Outstanding Student Branch Chapter Advisor Award.
- 3) **POSOCO Power System Award 2021-PPSA 2021** (National Doctoral Best Thesis Award in Power Systems).
- 4) **AWSAR Award 2021-AWSAR 2021** (Best Popular science story under the PDF Category).
- 5) **IEEE Best Paper Award 2021:** IEEE IAS GUCON 2021, Kaulalampur Malaysia, Sept 24-26-2021.

J. Contributions to the Institute:

- 1) Hall 14-Mess Warden (Since Sept 2024).
- 2) Internship Management and Placement Committee Convener (2025-2026).
- 3) PG Admission Committee Member (2022-2025).

K. Contributions outside the Institute:

- 1) General Co-Chair of the 2025 International Conference on Intelligent Computing and Its Emerging Applications, held in Melbourne, 3rd to 5th December 2025.
- 2) Chair of the Super Session 9, in the 6th IEEE International Conference on Electric Power and Renewable Energy, EPREC -2026 held at IIT Bhilai, During 2nd-4th Jan 2026.
- 3) NITK Surathkal B.Tech Curriculum Revision Committee Member (June 2025).
- 4) NIT Trichy M.Tech Thesis Evaluation Committee (2024).
- 5) GIPSA Award Evaluation Committee (2023-2024).
- 6) PMRF Review Committee Member (2022-2025).
- 7) PMRF Review Committee: Subject Coordinator (2025).
- 8) IEEE UP Section PES Chapter Chair (2024-2025).
- 9) IEEE PES R10 Technical Activity Coordinator (2024-2025).
- 10) IEEE PES Student Branch Faculty Advisor (2024-2025).
- 11) IEEE PES Member (USA): 2021 Onwards.