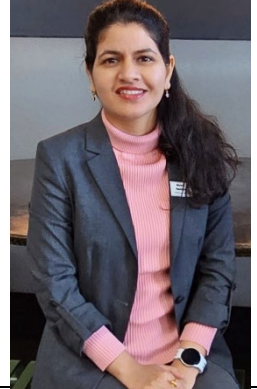


SHRUTI PANDEY

Address: 2021H Robert W Plaster, Center for Free Enterprise, Springfield Mo.
Email: spz8c@umsystem.edu
Mobile: +1(502)-249-5693



Research Interests

Power Converters Design, Renewable Energy, Control system, Hardware in Loop, Microgrid systems, Battery Management System.

Professional Experience:

Designation	Organization	Duration
Assistant Teaching Professor	Electrical and Computer Engineering Department, Missouri University of Science and Technology, Rolla, Missouri	Oct 2023 – August 2025
Postdoctoral Fellow cum Faculty Instructor	Conn Center of Renewable Energy, UofL, Kentucky.	Oct 2023 – August 2025
Visiting Research Scholar	Conn Center of Renewable Energy, UofL, Kentucky.	Sept 2022 – Sept 2023
Guest Lecturer on Power Electronics and Control Systems	Nominated by State Government University to take lectures on Power Electronics and Control Systems via National Channel DD SWAYAM PRABHA	May 2020 – July 2022
Assistant Professor	KIET Group of Institutions ,INDIA	Jan 2019 – July 2022
Junior Research Fellow	National Institute of Technology Delhi (Declared as an Institute of National Importance by Govt. of India)	Aug 2017 – Dec 2018
Research cum Teaching Assistant	Institute of Engineering and Technology, Lucknow , (Top Ranked State Government Engineering College)	Apr 2014 – Aug 2017
Lecturer	Babu Banarasi Das Engineering College , Lucknow	Aug 2012 – Apr 2014

Education

- Postdoc Fellow in Power Electronics, Control and Renewable Energy, Microgrids
Conn Center of Renewable Energy, UofL, Kentucky.
- PhD in Power Electronics (2019) Honors
Dr. APJ Abdul Kalam Technical University, Lucknow, UP, INDIA.
- MTech. in Power Electronics and Drives -2012
Madan Mohan Malviya University, Gorakhpur, UP, INDIA.
- B.Tech. in Electrical and Electronics Engineering 2010 (Honors with Distinction)
Integral University, Lucknow, UP, INDIA

Technical Skills

- PLECS, MATLAB/SIMULINK, PSIM, Embedded System, FPGA
- KI-CAD, Altium, Proteus (PCB Design)
- OPAL-RT, D-space, PLECS hardware in loop,
- DSP, FPGA, TEXAS INSTRUMENTS LAUNCH PAD.

- Automation Course in PLC and SCADA (Certified from SOFCON India Private Limited)
- Proficient in C, C++, and Python

Research Projects

1. Low Carbon Microgrid Integration at Conn Center.

- Leading the development and implementation of a unique centralized controller for decision-making, online health monitoring, fault diagnostics, and protection of stand-alone micro-grids.
- Developed a Rapid Control Prototyping Platform for Grid Connected Electrical Energy Conversion Systems for researchers.
- Developed and tested a custom full-bridge DC-DC converter and PWM inverter in PLECS hardware-in-loop, with controllers developed in PLECS and TI Launchpad.
- Conducted real time analysis for Nonlinear Self-Synchronizing (without PLL) Current Control for Single Phase Grid-Connected Inverters.
- Estimated speed control parameters of a PMSM drive in PLECS hardware-in-loop.
- Performed complete load testing of a closed loop controlled 60-Watt, 24V, 25Amp fuel cell for the microgrid system.

2. 120V Induction Cooktop with GE Appliances.

- Developed a 120V induction range capable of operating on a standard 120V, 15 Amp circuit.
- Engineered an 1800W AC/DC converter and a 230V, ~2 kWh battery pack with an integrated battery management system (BMS).
- Fabricated 72S pack with a functional BMS.
- Tested (CC, CV) charging, discharging, and power sharing between the supply and battery pack, at various C rates.
- Conducted cell-level testing and analysis using Electrochemical Impedance Spectroscopy (SP-200 Biologics) to measure resistance and assess overall heat loss generated by the pack.
- Performed thermal testing with thermistors at both cell and pack levels.
- Designed and tested custom PCBs for buck and flyback converters integrated between supply and the pack.
- Conducted hardware and closed-loop feed-forward current control testing for charging and discharging processes with the power converters using PLECS RT-Box (HIL) , TI C2000 Board and Embedded Systems.

3. Fast Charging Gas stations with SES Technologies.

- We have an ongoing project on a small and adequately controlled islanded DC Microgrid system for EV fast charging at a gas station in metro Louisville.
- This DC Microgrid charging station aims to reduce the dependency on the grid during peak load time, and it will also be helpful when the grid power is not available. For an effective micro-grid power system, the system needs to manage a multitude of control and optimization objectives across the time continuum to meet the power and energy demands of the user. This system will exhibit higher robustness against system uncertainties and unexpected disturbances, and higher resiliency against out-of-range variations of the charging current and will also keep the DC bus voltage constant.

4. **Higher-Order DC-DC Converters for Power Management of DC Nano-Grid for Futuristic Smart Building**

- I have worked as JRF in SERB-DST sponsored research project. During my 18 months tenure on this project, I performed detailed small signal and dynamic modeling analysis of several second and fourth-order power electronics converters, along with their simulation models, analog gate driver circuits and PCB designs. I have performed experimental work on Solar Power Modules and Solar PV Emulators and worked on different MPPT algorithms. I used my expertise on linear, non-linear controllers (viz. Sliding Mode Control), sensors and filters during my research to get the robust performance of converters in Microgrid systems. I have used DSP Controllers for the implementation of control algorithms and OPAL-RT, D-space for real-time validation.

5. **Modeling and Simulation of different Controllers and Converters in Renewable Energy fed Micro grid – (PhD thesis)**

- Designed a MATLAB based standalone microgrid system that comprise of an MPPT controlled Photovoltaic (PV) source, in conjunction with a supercapacitor, cascaded with a Sliding Mode Controlled inverter, supplying linear and nonlinear loads.

6. **Modelling and simulation of open and closed loop-controlled Buck and Boost converter for solar installation – (MTech. Major project)**

- Developed a MATLAB based model where solar power was efficiently used with the help of Power converters for driving ac and dc drives.

7. **Energy management using solar and fuel cell-based appliances in rural areas of India – (MTech. Minor project)**

- An attempt has been made to estimate the greenhouse gases potential using the diffusion models (pearl model used here) in rural areas of India which comprises of thousands of villages.

8. **Dissemination of Solar home lighting system in rural areas of Barabanki in INDIA located at a distance more than 3 miles from grid supply lines – (MTech. Minor project)**

- An innovation diffusion framework based on well-known Bass models was proposed to analyze and forecast the adoption patterns of solar home lighting for the upcoming 50 years.

9. **Industrial automation prototype using PLC SCADA- BTech Final Yr. Project**

- Designed and Implemented Industrial Automation Prototype for "Automatic Filling System" to fill water bottles placed on conveyor belts utilizing proximity sensors, PLC & SCADA.

Journal Publications

1. S Pandey, M McIntyre "Nonlinear Self-Synchronizing Current Control for Single-Phase AC Inverters" Energies 18 (4), 941, (SCI)
2. P. Shruti, B. C. Babu, Y. G. Praveen, C. P. Vipin, "Analytical tuning of 2-DOF smith predictor control scheme for dc–dc boost converter: a process control perspective", International Journal of Circuit Theory and Applications (**WILEY SCI**), (2021);49:641–655. <https://doi.org/10.1002/cta.2966>
3. S Pandey, M McIntyre, "Nonlinear Self-Synchronizing Current Control for Single Phase Grid-Connected Inverters." Communicated in International Journal of Circuit Theory and Applications (**WILEY SCI**).
4. S Pandey, N Priyadarshi, S Padmanabhan, "Power Management of Battery Integrated PV System with SMC-Controlled Bidirectional Converter"," DC—DC Converters for Future Renewable Energy Systems" **Springer**, Singapore, Pages 423-432 (2021) **SCOPUS INDEXED**

5. S Pandey, B Dwivedi, A Tripathi "Performance analysis of super capacitor integrated PV fed multistage converter with SMC controlled VSI for varying nonlinear load conditions", **International Journal of Engineering & Technology**; Vol 7, No 1 (2018) **SCOPUS INDEXED**
6. S Pandey, B Dwivedi, A Tripathi "Performance Analysis of Supercapacitor Integrated PV Fed Multistage Converter with SMC Controlled VSI for Variable Load Conditions", "**Advances in Intelligent Systems and Computing**" (Springer, Germany), pp 455-465, **SCOPUS INDEXED**
7. S Pandey, B Dwivedi, A Tripathi "Performance analysis of supercapacitor integrated PV fed multistage converter with SMC controlled VSI for different load conditions", **International Journal of Power Electronics and Drive Systems (IJPEDS)**, Vol 9, No 2 (2018) **SCOPUS INDEXED**
8. MA Mallick, I Ashraf, MI Khan, S Pandey, "Energy management using solar and fuel cell-based appliances in rural areas of India", **International Journal of Engineering, Science & Technology (IJEST)** Vol-3, No.1, 2011, pp. 265-271

Conference Publications:

1. N. Wilding, S. K. Sarkar, S. Pandey and M. L. McIntyre, "Nonlinear Control of Buck-Type Converters for Micro-Wind Generators," **2025 IEEE International Electric Machines & Drives Conference (IEMDC), Houston, TX, USA, 2025**, pp. 190-194, doi: 10.1109/IEMDC60492.2025.11061160.
2. S. K. Sarkar, N. Wilding, S. Pandey, N. Hawkins and M. L. McIntyre, "Filter Based Motor Control for Robotic Applications," **2025 IEEE International Electric Machines & Drives Conference (IEMDC), Houston, TX, USA, 2025**, pp. 1256-1261, doi: 10.1109/IEMDC60492.2025.11060957.
3. S Pandey, Michael McIntyre, "Rapid Control Prototyping Platform for Grid Connected Electrical Energy Conversion Systems." International Conference on IEEE Southeast Con **2024, Atlanta, Georgia, USA.**
4. S Pandey, B Dwivedi, A Tripathi, "Closed Loop Boost Converter Control of Induction Motor Drive fed by Solar Cells", **IEEE International Conference on Emerging Trends in Electrical Electronics & Sustainable Energy Systems (ICETEESES), 2016, KNIT Sultanpur**, Pages: 286 - 291, DOI: 10.1109/ICETEESES.2016.7581395
5. S Pandey, B Dwivedi, A Tripathi, "Performance Analysis of SMC Controlled PV Fed VSI" IEEE International Conference (**ICPEICES-2016**), DELHI TECHNICAL UNIVERSITY (**DTU**), Pages 1-6, DOI: 10.1109/ICPEICES.2016.7853523
6. S Pandey, B Dwivedi, A Tripathi, "Performance Analysis of SMC Controlled PV Fed Boost Converter", IEEE Seventh India International Conference on Power Electronics (**IICPE-2016**), **THAPAR University** November 17-19, 2016, Pages: 1-4, DOI: 10.1109/IICPE.2016.8079544
7. S Pandey, B Dwivedi, A Tripathi, "Performance Analysis of PV Fed Multistage Converter with SMC Controlled VSI", UPCON IEEE-2016, **IIT-BHU** Varanasi, Pages: 473 - 478, DOI: 10.1109/UPCON.2016.7894700
8. S Pandey, B Dwivedi, A Tripathi, "Energy management using solar and fuel cell-based appliances in rural areas of India", national conference RAEPESM 2011 (25th -26th March), MMMEC Gorakhpur, INDIA
9. S Pandey, B Dwivedi, A Tripathi, "Modelling and simulation of Closed Loop Controlled Boost Converter for solar Installation", national conference NCETEEE-16 (19th -20th Aug), I.E.T. Lucknow, INDIA.

Book Editor:

1. Edited a book entitled "**Advanced Control & Optimization Paradigms for Energy System Operation and Management**", by River Publication (partner with IEEE), ISBN: 9788770226684.

Training

- Summer training of four weeks in Uttar Pradesh Power Corporation Limited, Lucknow
Role/Responsibilities: Study of 132 KV Gomti Nagar sub-station Lucknow
- Training in Larsen & Toubro on Low Voltage Switch Gears

Professional Membership

- IEEE, (Id: 92282546)

Professional Activities

- Received best paper award in an international conference SIGMA 2018 organized by NSIT Delhi (23-25 Feb 2018) <http://www.nsit.ac.in/static/images/SIGMA2018/Best%20Paper%20Award.pdf>
- **Received Young Drona Charya Award (Best Teaching Faculty Award) 2020** with cash prize of INR 11,000/- at KIET Ghaziabad, India.
- Chaired a session in a 2-day IEEE Conference (International Conference on Advance Computing and Innovative Technologies in Engineering) held at GALGOTIAS COLLEGE OF ENGINEERING AND TECHNOLOGY, Greater Noida, INDIA in March 2020-21.
- Invited as Chief Guest at BIET (in 3 days National Webinar on New Paradigm of Industry Research trends in VLSI and Data science) one of the largest Engineering Colleges in Telangana, INDIA in September 2020.
- Organizer and Co-Ordinator of VCIPEC 2020 a two days International Conference (VCIPECH-2020)" on 06-07 November 2020. organized KIET Ghaziabad, India.
- Organizer and Co-Ordinator of One Week STTP on "Emerging Trends and Challenges in Grid Connected Renewable Power Generation" from 1st - 6th July 2019 organized KIET Group of Institutions Ghaziabad.
- Co-Ordinator of E-vehicle Club at KIET Group of Institutions Ghaziabad.
- Foundation Knowledge of German Language
- Reviewed multiple papers of several Journals and conferences-
 - International Transactions on Electrical Energy Systems (**Wiley**)
 - 2024 IEEE Energy Conversion Congress And Exposition (**ECCE**), in Phoenix, Arizona on October 20-24, 2024
 - IEEE **Southeast Con 2024** Atlanta, GA, USA - 15-24 March 2024

References:

Prof. Michael Mclyntyre
ECE, UofL, Louisville
+1(270)-562-5329
michael.mcintyre@louisville.edu

Prof. Akshay Rathore
SIT Singapore
+91 9928673580
rathoreakshay@gmail.com

Prof. Bharti Dwivedi
Electrical Eng., IET Lucknow
+919936452439
bharti_dwivedi@yahoo.com