

Publications

International Journals:

- Sonali Singh, Ankit Sachan, Jitendra Kumar Goyal, Shubhi Purwar, **“Encoder/decoder mismatch for input quantization with discrete time [K,KL] sector”**, International Journal of System Science, March 2025.
- S. Yadav, N. Kishor, S. Purwar, P. Raussi, and S. Chakrabarti, **“Switching attack modeling and vulnerability analysis of generator for dynamics study”**, Sustainable Energy, Grids and Networks, February 2024.
- Sonali Singh, Jitendra Kumar Goyal, Ankit Sachan, Amutha Prabha N., Awaneendra Kumar Tiwari, Shyam Kamal, Sandip Ghosh, Shubhi Purwar, Xiaogang Xiong. **“Modified ESO based disturbance rejection for dynamical systems: An experimental study,”** Journal of Process Control, June 2024.
- A. Anand, D. Guha, and S. Purwar, **“Adaptive Consensus Control of Leader-Follower MultiAgent System with Actuator Deception Attacks,”** Chaos, Solitons and Fractals, July 2024.
- Ankit Sachan, Sonali Singh, Shubhi Purwar, Jitendra Kumar Goyal, **“Supervisory-based Quantized Hands-off Control for a Class of Uncertain Systems with Nonlinear Sector”**, International Journal of Systems Science, Oct 2023.
- V. Patel, D. Guha, and S. Purwar, **“Frequency Regulation of Time-delayed Power System utilizing Nonlinear Resilient Controller”**, International Journal of Automation and Control, November 2023.
- S. Yadav, N. Kishor, S. Purwar, S. Chakrabarti, P. Raussi and A. Kumar, **“Real-time Implementation for Vulnerability of Power Components under Switching Attack Based on Sliding Mode”**, IET Cyber-Physical Systems: Theory& Applications, Dec 2023
- Aradhna Patel and Shubhi Purwar, **“Design of Event Trigger based Multirate Sliding Mode Load Frequency Controller for Interconnected Power System”**, ISA Transactions, December 2022.
- V. Patel, D. Guha, and S. Purwar, **“Frequency Regulation of Nonlinear Power Systems using Neural Network Observer-based Optimized Resilient Controller”**, International Transactions on Electrical Energy Systems, July 2022.
- V. Patel, D. Guha, and S. Purwar, **“Optimized cascade fractional-order 3DOF-controller for frequency regulation of a hybrid power system using marine predators algorithm,”** International Journal of Numerical Modelling: Electronic Networks, Devices And Fields, May 2022.
- Aradhna Patel and Shubhi Purwar, **“Novel Resilient Compensator design for FDI attack mitigation on AGC System”**, International Journal of Modelling and Simulation, April 2022.
- Vivek Patel, Dipayan Guha, Shubhi Purwar, **“Disturbance Observer-based Higher-order Sliding Mode Controller for Frequency Regulation of Hybrid Power Systems”**, International Journal of Automation and Control, January 2022.

- Vivek Patel, Dipayan Guha, Shubhi Purwar, “**Neural Network aided Fractional-Order Sliding Mode Controller for Frequency Regulation of Nonlinear Power Systems**”, Computers and Electrical Engineering, October 2021.
- Aradhna Patel and Shubhi Purwar, “**Event Triggered Detection of Cyber Attacks on Load Frequency Control**”, IET Cyber-Physical Systems: Theory & Applications, May 2020
- Satya Prakash, Shubhi Purwar & Soumya R. Mohanty, “**Adaptive Detection of Islanding and Power Quality Disturbances in a Grid-Integrated Photovoltaic System**”, Arabian Journal for Science and Engineering, February 2020
- Aradhna Patel and Shubhi Purwar, “**Switching Attacks on Smart Grid using Nonlinear Sliding Surface**”, IET Cyber-Physical Systems: Theory & Applications, September 2019.
- S. Singh and S. Purwar, “**Enhanced Composite Nonlinear Control Technique using Adaptive Control for Nonlinear Delayed Systems**”, Recent Advances in Electrical & Electronic Engineering, May 2020.
- Sheetla Prasad, Shubhi Purwar, Nand Kishor, “**Non-linear sliding mode control for frequency regulation with variable-speed wind turbine systems**,” International Journal of Electrical Power & Energy Systems, November 2019.
- Sheetla Prasad, Shubhi Purwar, and Nand Kishor, “**Load Frequency Regulation using Observer based Non-linear Sliding Mode Control**”, International Journal of Electrical Power Energy Systems, June 2019
- S. K. Mishra, S. Purwar and N. Kishor, “**Event-Triggered Nonlinear Control of OWC Ocean Wave Energy Plant**,” IEEE Transactions on Sustainable Energy, March 2018.
- Mishra, S.K.; Purwar, S.; Kishor, N. “**Maximizing Output Power in Oscillating Water Column Wave Power Plants: An Optimization Based MPPT Algorithm**,” Technologies, January 2018.
- Bhanu Pratap and Shubhi Purwar, “**Real-Time Implementation of Nonlinear State and Disturbance Observer Based Controller for Twin Rotor Control System**”, International Journal of Automation and Control, March 2019
- S. Singh and S. Purwar, “**Two Term Control Strategy For Position Control Of Twin Rotor System**,” International Journal of Applied Mathematics And Informatics, November 2017.
- Sonal Singh, Shubhi Purwar and Abhijit Kulkarni, “**Two term Composite non-linear feedback controller design for non-linear time-delay systems**” Transactions of the Institute of Measurement and Control, September 2017
- Sheetla Prasad, Shubhi Purwar, and NandKishor , “**Non-linear sliding mode load frequency control in multi-area power system**”, Elsevier, Control Engineering Practice, February 2017
- A. Kulkarni and S. Purwar , “**Adaptive nonlinear gain based composite nonlinear feedback controller with input saturation**,” IMA Journal of Mathematical Control and Information, January 2017.

- Sunil Kumar Mishra, Shubhi Purwar and Nand Kishor, **“An Optimal and Non-Linear Speed Control of OWC Wave Energy Plant with Wells Turbine and DFIG,”** International Journal of Renewable Energy Research, July 2016
- Sheetla Prasad, Shubhi Purwar, and Nand Kishor, **“H-infinity based non-linear sliding mode controller for frequency regulation in interconnected power systems with constant and time-varying delays,”** IET Generation Transmission and Distribution, August 2016.
- Nand Kishor, Liisa Haarla and Shubhi Purwar, **“Stability analysis and stabilization of delayed reduced-order model of large electric power system,”** International Transaction Electrical Energy System, January 2016
- Sunil Kumar Mishra, Shubhi Purwar, and Nand Kishor, **“Design of non-linear controller for ocean wave energy plant,”** Control Engineering Practice, August 2016
- Nand Kishor, Janne M Seppanen, Jukka Turunen, Antti- Juhani Nikilla, Liisa C Haarla, Shubhi Purwar, **“Low-order Controller Design using Remotely Measured Time-delayed Signals for Stabilisation of Equivalent Power grid,”** IET Generation, Transmission & Distribution, December 2015
- A. Kulkarni and S. Purwar, **“Nonlinear Experimental Estimation and Verification of a MIMO system through EKF,”** Journal of Electrical Engineering, 2015
- Vikas Sharma and Shubhi Purwar, **“Nonlinear Controllers for a Light Weighted All- Electric Vehicle using Chebyshev Neural Network,”** International Journal of Vehicular Technology, April 2014
- Vikas Sharma and Shubhi Purwar, **“Chebyshev Neural Network based Discrete-time Adaptive Speed Control for a Light Weighted All-Electric Vehicle,”** International Review of Electrical Engineering, 2014.
- Bhanu Pratap and Shubhi Purwar, **“Real-Time Implementation of Neuro Adaptive Observer Based Robust Backstepping Controller for Twin Rotor Control System,”** Journal of Control, Automation and Electrical Systems, January 2014.
- Bhanu Pratap and S. Purwar, **“Real-time Implementation of State Observers for Twin Rotor MIMO System: An Experimental Evaluation”** International Journal of Modelling, Identification and Control, May 2013.

Conferences:

- Pallavi Kumari, Pankaj K Mishra, Shubhi Purwar, **“Approximation-Free Non-Linear Quasi-SMC Design for Single-Link Manipulator with Motor Dynamics,”** Accepted in 6th International Conference on Control and Fault-Tolerant Systems (SysTol) to be held in Ayia Napa, Cyprus during October 6-8, 2025.
- S. Yadav, N. Kishor, S. Purwar, **“Detection and Mitigation using PCA- Adaptive Sliding mode Controller,”** DoCEIS, Portugal, July 2025.

- P. Kumar, A. Anand, D. Guha, and S. Purwar, **“Leader-Follower Consensus Control of Multi Agent Systems with Disturbance by Distributed Sliding Mode Control,”** IEEE 1st Int. Conf. on Smart and Sustainable Developments in Electrical Engineering, Feb 28 - March 2, 2025.
- P. Kumar, A. Anand, D. Guha, and S. Purwar, **“Second-Order Consensus in Heterogeneous Multi-Agent Systems by Distributed Sliding Mode Control,”** IEEE 1st Int. Conf. on Sustainable Energy Technologies and Computational Intelligence (SETCOM 2025), February 21 – 23, 2025.
- S. Yadav, N. Kishor, S. Purwar, V.S. Rajkumar, and A. Ştefanov, **“A State Partition Particle Filter based Approach for Detection of Switching Attack”**, In International Conference on Smart Grid Communications (SmartGridComm), Norway, September, 2024.
- S. Yadav, N. Kishor, S. Purwar, V S. Rajkumar, and A. Ştefanov, **“A State Partition Particle Filter based Approach for Detection of Switching Attack”**, In 2024 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), September 2024.
- A. Anand, D. Guha, and S. Purwar, **“Cooperative Formation Control of the Multi-Agent System,”** IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (IEEE SeFeT 2024), 31 July - 03 August, 2024.
- Sonali Singh, Ankit Sachan, Jitendra Kumar Goyal, Sandeep Kumar Soni, Shaym Kamal, Shubhi Purwar. **“Implicit-Euler Discretization with Twisting Algorithm Via Immersion & Invariance Approach.** 22nd IFAC World Congress, IFAC-Papers OnLine, November 2023.
- Sonali Singh, Ankit Sachan, Jitendra Kumar Goyal, Shubhi Purwar, Neeraj Gupta, Ganta Jane Gladys, Gouri P P, Surender Hans. **“Design and Stability Analysis of Non-smooth Integral Sliding Surface for Coupled-Tank System with Matching/Non-matching Disturbance.”** Australian & New Zealand Control Conference (ANZCC2024), Gold Coast, Australia, Feb. 1-2, 2024.
- Sonali Singh, Ganta Jane Gladys, P.P. Gouri, Jitendra Kumar Goyal, Ankit Sachan, Surender Hans, Shubhi Purwar, Neeraj Gupta. **“Robust H1 Controller Design With Regional Pole- Placement for Quarter Car Active Suspension System.”** Australian & New Zealand Control Conference (ANZCC2024), pp. 229-234, Gold Coast, Australia, Feb. 1-2, 2024.
- Sonali Singh, Ankit Sachan, Sandeep Kumar Soni, Jitendra Kumar Goyal, Shubhi Purwar. **“Quan-tized Input Signal based Adaptive Terminal Sliding Mode Control for Robotic Manipulator.”** 8th IFAC International Conference on Advances In Control And Optimization Of Dynamical Systems (ACODS2024), IFAC-PapersOnLine, May 2024.
- Sonali Singh, Ankit Sachan, Sandeep Kumar Soni, Jitendra Kumar Goyal, Shubhi Purwar. **“Fast-terminal Super-twisting Control Applications to Quadrotor UAV.”** 8th IFAC International Conference on Advances In Control And Optimization Of Dynamical Systems (ACODS2024), IFAC-PapersOnLine, May 2024.
- A. Anand, D. Guha, and S. Purwar, **“Adaptive Cooperative Control of the Multi-Agent System,”** In 2023 IEEE 3rd International Conference on Sustainable Energy

and Future Electric Transportation (SEFET), pp. 01-05, IEEE, August 2023.

- S. Yadav, N. Kishor, S. Purwar, and S. Chakrabarti, 2023, "**Indirect Cyber-Physical Attack with Combined Circuit Breaker and Excitation System**", In IEEE EUROCON 2023-20th International Conference on Smart Technologies, pp. 204-209, IEEE, July 2023.
- A. Ghosh, and S. Purwar, "**Detection of FDI Attacks on Power Grid Using Graph-Theoretical Methods**", In International Conference on Power Engineering and Intelligent Systems (PEIS), pp. 391-402, Singapore: Springer Nature Singapore, June 2023.
- S. Singh, A. Sachan, SkK. Soni, S. Purwar, J.K. Goyal, and S. Kamal, "**Implicit-Euler Discretization with Twisting Algorithm via Immersion & Invariance Approach**," IFAC-Papers On Line, 56(2), Jan 2023.
- V. Patel, D. Guha and S. Purwar, "**Fractional-order Adaptive Sliding Mode Approach for Frequency Regulation in Power System**," 2021 9th IEEE International Conference on Power Systems (ICPS), December 2021.
- V. Patel, D. Guha and S. Purwar, "**Frequency regulation of hybrid power system using reduced order disturbance observer-based integral sliding mode controller**," 2020 21st National Power Systems Conference (NPSC), December 2020.
- N. Patel and S. Purwar, "**Adaptive Neural Control of Quadcopter with Unknown Nonlinearities**," 2020 IEEE International Conference on Computing, Power and Communication Technologies (GUCON), October 2020.
- Agarwal, D. Guha and S. Purwar, "**Quasi-oppositional dragonfly algorithm: applied for frequency regulation of an isolated hybrid energy distributed power system**," 2020 IEEE 9th Power India International Conference (PIICON), June 2020.
- V. Patel, D. Guha and S. Purwar, "**Frequency regulation of an islanded microgrid using integral sliding mode control**," 2019 8th International Conference on Power Systems (ICPS), December 2019.
- N. Kumar, A. Porwal, A. R. Singh, R. Naskar and S. Purwar, "**Event Triggered Control of Robot Manipulator**," 2019 6th International Conference on Signal Processing and Integrated Networks (SPIN), Noida, India, May 2019.
- A. Patel and S. Purwar, "**Destabilizing smart grid by dynamic load altering attack using PI controller**," 2017 International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICICT), Kannur, July 2017, pp. 354-359.
- R. Kumar, A. Patel and S. Purwar, "**An adaptive control technique for trajectory tracking of a mobile robot using synchronization method**," 2017 International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICICT), Kannur, July 2017.
- S. Singh and S. Purwar, "**Two term controller design for multivariable linear time delay systems**," 2017 IEEE 16th International Conference on Cognitive Informatics & Cognitive Computing (ICCI*CC), Oxford, July 2017.
- S. Singh and S. Purwar, "**Two term control strategy for position control of twin rotor system**," 2017 4th International Conference on Control, Decision and Information Technologies (CoDIT), Barcelona, 2017, pp. 0926-0931.
- S. Prasad, S. Purwar and N. Kishor, "**Non-linear sliding mode based load frequency**

control for power systems using unknown-input-observer," 2017 Indian Control Conference (ICC), Guwahati, January 2017, pp. 233-239.

- S. K. Mishra, S. Purwar and N. Kishor, "**Fuzzy logic control of OWC wave energy plant for preventing wells turbine stalling,**" 2016 IEEE 7th Power India International Conference (PIICON), Bikaner, November 2016, pp. 1-6.
- Sunil Mishra, Shubhi Purwar and Nand Kishor, "**Air Flow Control of OWC Wave Power plants using FOPID Controller,**" MSC, Sydney, Sept. 21-23, 2015.
- Sheetla Prasad, Shubhi Purwar and Nand Kishor, "**On Design of a Nonlinear Sliding mode LFC of Interconnected Power System with Communication Time-delay**", MSC, Sydney, Sept. 21-23, 2015.
- Vikas Sharma and Shubhi Purwar, "**Adaptive Speed Control of a Light Weighted All-Electric Vehicle with Unknown Time-delay,**" SCES, Allahabad, May 28-30, 2014.
- Sunil Mishra and Shubhi Purwar, "**To Design Optimally Toned FOPID Controller for Twin Rotor MIMO system,**" SCES, Allahabad, May 28-30, 2014.
- Vikas Sharma and Shubhi Purwar, "**Discrete-Time Backstepping Control for a Light Weighted All- Electric Vehicle,**" INDICON, Mumbai, Dec 13-15, 2013.
- Vikas Sharma and Shubhi Purwar, "**Nonlinear Backstepping Control for a Light Weighted All- Electric Vehicle,**" in International Conference on Recent Trends in Power, Control and Instrumentation Engineering (PCIE 2013), Hyderabad, India, Nov. 8-9, 2013.

Book Chapters:

- Anand, D. Guha and S. Purwar, "**Distributed Adaptive Fault-tolerant Consensus Control of Multi-agent Systems with Deception attacks,**" Enhancing the Control of Systems and Devices: Improving Performance, Reliability and Adaptability in Dynamic Environments, Academic Press (Elsevier), March 26, 2024.
- A. Patel and S. Purwar, "**Event-Triggered Sliding Mode Controller Design for Interconnected Power System,**" Lecture Notes in Electrical Engineering, Springer India, February 2022.
- V. Patel, D. Guha, and S. Purwar, "**Minimum order disturbance observer-aided integral sliding mode controller for frequency regulation of hybrid power system,**" Control of Standalone, July 2021.
- V. Patel, D. Guha, and S. Purwar, "Disturbance observer aided adaptive sliding mode controller for frequency regulation in hybrid power system," Microgrids: Modeling, Control and Applications, Academic Press (Elsevier), Chapter 2, October 2021.