Sunny Kumar, Ph.D. Electrical

Assistant Professor, Electrical Dept.VJTI, Mumbai, India
+91 90406 03119
sunnykr642@gmail.com/ sskumar@ee.vjti.ac.in

Education

2021-2024 **PhD, Electrical Engineering**, *ICT*, Mumbai, Maharashtra, India., in collaboration with the CoE-CNDS, VJTI, Mumbai
Thesis Title- **Smart Grid Operation and Control with RT-HIL Testbed for Protection and Islanding Scheme**
Presented research at **PESGM 2023, Florida, USA**

2018-2020 **M.Tech, Power Systems**, *VJTI*, Mumbai, Maharashtra, India.
Thesis Title- **Low rank approximation of dynamical system**

2013-2017 **B.Tech., Electrical Engineering**, *TAT, Bhubaneshwar*, Odisha, India

Jan 2021 **IELTS: Overall 6.0**

Experience

Aug-2024 Till date — Assistant Professor(Adhoc), at **Electrical Engg Dept, VJTI**, Mumbai, India
Courses taught: Applied Linear Algebra, Numerical Relay and Wide Area Protection; Lab Experiments Conducted: Basic Electrical Engg, Electrical Machines, Drives and Control Lab, Power System Analysis.

Aug-2021 July 2024 — Teaching Assistant (TA), at **ICT**, Mumbai, India
Lab Experiments Conducted: Basic Electrical Engg, Electrical Machines and Electrical Drives

Nov-2020 Oct-2021 — Junior Research Fellow (JRF), at **CoE-CNDS, VJTI**, Mumbai, India
Major Research project: Mumbai Grid Blackout Analysis

Projects Participated, Developed, and Guided

2024-ongoing **Development of Typhoon RT-HIL set up for implementation and validation of complex power grid.**

2024-ongoing **Development of Typhoon RT-HIL set up with dSAPCE for motor control and drives application (academic model)**

2023-2024 **Development of mathematical model for MATLAB simulation of inverter dominated hybrid grid stability analysis.**

2023 **Development of simulation model using PSAT for IBR-rich hybrid grid operation and stability analysis.**

2023 **Test-bed setup for RT-HIL - Development of RT-HIL set up for implementation and validation of complex power grid.**

2020-2021 **Development of dynamic model for cascade failure analysis of Mumbai Grid blackout occurred on 12 Oct 2020**

2021-2022 **Restoration of Mumbai grid after the blackout of Oct 2020**

2022-2024 **Development of Actual-Virtual Machines Lab, a kind of unique project to provide a practical guide for of all Machines experiments (transformers and Ac and DC Machines)for Diploma, UG and PG students academic purpose. (https://sites.google.com/ee.vjti.ac.in/actual-virtual-machines-lab/team)**

Selected Publications

ICPC2T (2024) **S. Kumar**, A. Chavekar, A. Pandey, P. Goswamić and F. S. Kazi "Real-Time Hardware-in-Loop Test Bench for Power System Analysis," *ICPC2T, 2024, NITRR*

IEEE Access (2022) A. Pandey, **S. Kumar**, S. Mohire, P. Pentayyać and F. S. Kazi, "Dynamic Modeling and Cascade Failure Analysis of the Mumbai Grid Incident of October 12, 2020," *IEEE Access, vol. 10, pp. 43598-43610, 2022. doi: 10.1109/ACCESS.2022.3160740*

IEEE TPS (2023) **S. Kumar**, A. Pandey, P. Pentayya, P. Goswami, and F. S. Kazi, "Analysis of Mumbai Grid Failure Restoration on Oct 12, 2020: Challenges and Lessons Learnt," *IEEE Trans. on Power Systems* [Presented at PESGM 2023]

.

MED (2020) **S. Kumar**, A. Sheikh, S. Wagh, and, N M Singh, "Prediction and classification of temperature data in smart building using dynamic mode decomposition," *Mediterranean Control Conference (MED). Sept 2020, France*

CoDIT (2020) **S. Kumar**, and A. Sheikh "Dynamic Mode Decomposition for Prediction and Enhancement of Rotor Angle Stability," 30^{th} *International Conference on Control Decision and Information Technologies (CoDIT), July 2020, Czech Republic*

ICEFEET (2022) M. Patil, A. Pandey, **S. Kumar**,P. Pentayya, and F. Kazi, "Modeling and EMT Simulation of Renewable Energy Sources using HYPERSIM," 2^{nd} *International Conference on Emerging Frontiers in Electrical and Electronic Technologies (ICEFEET), Jun 2022.*

Skills and Knowledge

Hardware: Opal-RT OP5600, Typhoon HIL, dSPACE Control Desk, Hypersim, Micom Relay, PMU, IEC 61850, Modbus

Languages: Python, Julia, MATLAB, SIMULINK, SCILAB, C

Software: DIgSILENT PowerFactory, ETAP, PSS-E, Opal-RT, Typhoon, MS Windows, MS Office, Visio and GAMS, LaTeX.

Professional Membership

IEEE Member (Number - 98188456)

Scholarships Received

2023 **Travel grant** received from CoE-CNDS, VJTI, Mumbai for paper presentation in USA

2021-2024 **Scholarship during PhD:** Selected for AICTE Doctoral Fellowship (ADF) for PhD in Electrical Engineering at ICT, Mumbai, India (2021-24)

2018-2020 **AICTE GATE scholarship:** Received AICTE GATE scholarship during M.Tech at VJTI, Mumbai

Training Courses / Workshops Attended (Selected)

2023 **Bug Bounty-Ethical Hacking**

2022 **100W Cybersecurity Practices for Industrial Control Systems**

2021 **Workshop on Cyber-Physical Systems Security for Advanced Metering Infrastructure CPRI, Bengaluru**

2021 **Workshop on Perspectives in Linear Control System VJTI, Mumbai**

2021 **Introduction to Deep Learning by HSE University**