

SWAGAT DAS

[das-swagat.github.io](https://github.com/das-swagat) | swagatdas2007@gmail.com | dass16@vcu.edu



EDUCATION

Doctor of Philosophy in Computer Science (Focus: AI and Cybersecurity)

Jan 2025 – Present

Virginia Commonwealth University, Richmond, USA

Master of Science in Electrical Engineering (Focus: Energy & Power Systems)

Graduated in May, 2016

University of Missouri, Kansas City, USA

Bachelor of Technology in Electrical Engineering

Graduated in May, 2014

Kalinga Institute of Industrial Technology, Bhubaneswar, India

RESEARCH AND PROFESSIONAL EXPERIENCE

Virginia Commonwealth University, Richmond, USA

Jan 2025 – Present

Graduate Research Assistant, Modern Heuristics Research Group (MHRG)

- Developed a real-time EV charger health analytics and forecasting platform with Idaho National Laboratory using Python, Dash, Mapbox, Dask, geospatial analysis, and approximately 1 million charging sessions.
- Developed scalable aerial LiDAR and 3D point cloud segmentation pipelines with the Virginia Innovation Partnership Corporation using PyTorch, GPU/HPC, semantic segmentation, domain adaptation, and class-imbalance handling.
- Developed an edge-based traffic video analytics pipeline on NVIDIA Jetson devices, combining YOLO detection and drivable-area segmentation, ByteTrack multi-object tracking, road-bound filtering, and trajectory analysis.
- Building a phased smart-manufacturing cybersecurity testbed that generates plant digital twins from SysML and network representations, converts them into Docker/Containernet cyber ranges, and supports attack-graph generation and controlled vulnerability testing through human-supervised agentic LLM workflows.
- Developing self-supervised anomaly detection for cyber-physical systems and diffusion-based 2D/3D medical imaging methods, with emphasis on explainable AI, responsible AI, and human-AI collaboration

Kalinga Institute of Industrial Technology, Bhubaneswar, India

August 2017 – December 2024

Assistant Professor - School of Electrical Engineering

- Taught and developed 12+ courses in power systems, power electronics, renewable energy, IoT, and industrial automation; contributed to curriculum, applied research, accreditation, and student mentoring.
- Helped establish industrial automation and PCB manufacturing laboratories with industry partners.

Assistant Director - University Quality Assurance Cell

- Led NAAC, NBA, ABET, QS, THE, and NIRF accreditation, ranking, audit, compliance, and institutional reporting.
- Built data-driven academic assessment and sustainability dashboards and coordinated reporting with external bodies.

University of Missouri – Kansas City, USA

January 2016 – July 2017

Graduate Research Assistant, Missouri Centre for Advanced Power (MCAP)

- Conducted research on power semiconductor aging, condition monitoring, and reflectometry based fault diagnosis, contributing to projects supported by NREL, DOE, and the University of Missouri Research Board.
- Designed and built an accelerated aging and diagnostic test platform for high-power switching devices using regulated power delivery, thermal management, PCB gate drivers, simulation, and laboratory validation.

SKILLS & COMPETENCIES

Artificial Intelligence and Machine Learning: Machine Learning, Deep Learning, Supervised Learning, Self Supervised Learning, Anomaly Detection, Time Series Forecasting, Predictive Modeling, Transformers, Graph Neural Networks, Diffusion Models, Domain Adaptation, Class Imbalance Handling, Feature Engineering, Model Evaluation, Explainable AI, Responsible AI, Human AI Collaboration

Computer Vision, Medical Imaging and Perception: Computer Vision, Medical Imaging, 2D and 3D Image Analysis, LiDAR, Point Cloud Processing, 2D and 3D Perception, Edge AI, Embedded Vision, Object Detection, Multi Object Tracking, Semantic Segmentation, Instance Segmentation, Video Analytics, Trajectory Analysis, OpenCV, YOLO, ByteTrack

Cybersecurity and Cyber Physical Systems: Cyber Physical Systems, Industrial Cybersecurity, Operational Technology, Industrial Control Systems, SCADA, Smart Manufacturing, Critical Infrastructure Security, Digital Twins, SysML, Attack Graphs, CAN Bus Security, Intrusion Detection Systems, Adversarial Machine Learning, Vulnerability Assessment, Penetration Testing, Cyber Range Evaluation, Red Team and Blue Team Evaluation, NIST Cybersecurity Framework

Large Language Models and Agentic AI: Large Language Models, Generative AI, Agentic AI, Human Supervised AI, Tool Augmented Reasoning, Model Context Protocol, Knowledge Representation, Graph Based Reasoning, Asset Level Risk Reasoning, Human Oversight, Decision Support Systems

Programming, Data and Computing Platforms: Python, PyTorch, Pandas, NumPy, Dask, cuDF, OpenCV, Docker, Containernet, Linux, Git, Jupyter, MATLAB, High Performance Computing, Parallel Computing, Distributed Computing, Large Scale Data Processing, C++, NVIDIA Jetson, Embedded Systems

Visualization, Geospatial Analytics and Engineering: Dash, Plotly, Mapbox, Interactive Dashboards, Data Visualization, Visual Analytics, Geospatial Analytics, Remote Sensing, EV Charging Infrastructure, Predictive Maintenance, Power Electronics, Smart Grid, Internet of Things

RESEARCH PUBLICATIONS

[1] Human-Supervised Agentic LLM Workflows for Industrial Cybersecurity: NIST-Aligned Task Mapping and Testbed Evaluation Criteria, IEEE HSI, 2026

[2] Learning Beyond Labels: Self-Supervised Methods for Anomaly Detection in Cyber-Physical Systems, IEEE IECON, 2025

[3] KPU-Net: Kernel Point U-Net for 3D LiDAR Ground Segmentation, IEEE IECON, 2025

[4] GAP-CAN: Gradient-Based Adversarial Attack on Transformers for CAN Bus Anomaly Detection, IEEE ICPS, 2025

[5] A Single-Source-Based 13-Level Switched Capacitor Multilevel Inverter with Reduced Components, IEEE STPEC, 2023

[6] Review of Faults in Transformers, International Journal of Engineering Applied Sciences and Technology, 2022

[7] Identification of the Dominant Harmonic Source Type in the Distribution Network Using the Soft Computing Technique, International Transactions on Electrical Energy Systems, 2022

[8] GaN-Based Isolated Bidirectional DC-DC Converter for High Load Current Application, IEEE DELCON, 2022

[9] Status of Energy in Syria: Study on How to Meet the Energy Shortage by Means of Renewable Resources, International Renewable Engineering Conference, 2021

[10] Performance Evaluation of PV-SOFC Grid-Integrated 3P3W System by UPQC with Sinusoidal Current Control Strategy at Constant Irradiance, IEEE HYDCON, 2020

[11] DGA and AI Technique for Fault Diagnosis in Distribution Transformer, ETAEERE, 2020

[12] A Novel Single-Phase Switched Capacitor Multilevel Inverter with Voltage Boosting Ability for Renewable Applications, ETAEERE, 2020

[13] Emerging Trends in Electric Vehicles in the Indian Market, RDCAPE, 2019

[14] Arduino-Based Safety Device for the Visually Challenged, IEEE ICCSP, 2019

[15] Classification of Different Types of Faults in a Photovoltaic System, ICCPEIC, 2018

[16] Active Power Cycling and Condition Monitoring of IGBT Power Modules Using Reflectometry, IEEE APEC, 2018

[17] Detection of Aging-Related IGBT Bond-Wire Lift-Off Using Spread Spectrum Time Domain Reflectometry, IEEE APEC, 2017

PATENTS

[1] "An Edge Computing Based Fault Detection and Localization for Intelligent DG Unit Disconnection in Power Distribution Networks", Indian Patent 202331053127, published 2024

[2] "IoT-Based Data Acquisition Server Machine", Indian Design Patent 413789, published 2024

CERTIFICATIONS AND RESEARCH TRAINING

Research Ethics, Compliance, and Clinical Research, CITI Program: Research Study Design (RSD); Research Security Training (Combined); Redefining Ethical Research Practice in the Age of AI; Information Security; ICH E6(R3): An Introduction; Health Privacy (HIPAA); General RCR Training; Gen AI in Research Design; GCP for Clinical Investigations of Drugs and Devices (FDA); Biomedical; Artificial Intelligence: The Impact on Academic and Research Integrity; Artificial Intelligence (AI) and Human Subject Protections.

Artificial Intelligence and Machine Learning: Neuro-symbolic AI: The Third Wave of AI; Supervised Machine Learning: Regression and Classification; Football Analytics Using Python.

Industrial AI, Cybersecurity, and Smart Systems: 2025 National Security Collegiate Academy; AI Frontiers 2025: Driving the Next Revolution in Smart Manufacturing; Harnessing AI and GenAI for Smarter Industrial Systems: Use Cases and Future Trends; IIoT World Energy Day 2026, Certificate of Attendance; SCADA Basic; IoT Foundations: Fundamentals.

Energy, IoT, and Engineering: Advancing Grid Resilience: Intelligent Control, Grid-Forming Inverters, and EV; An AI/IoT-Based System of GEOsensor NETWORKs for Real-Time Monitoring of Unstable Terrain and Artificial Structures; Electrical Engineering Simulations with ETAP by Coursovie Training Inc.; CornellX ENGR2000X: A Hands-on Introduction to Engineering Simulations.

Academic and Professional Development: QS Higher Ed Summit: Asia Pacific 2024; QS India Summit 2024; Verified International Academic Qualifications; International Graduate Teaching Assistant (IGTA).