Rajarshi (Raj) Roychowdhury

Professional Engineer (PE) · Power Systems Technical Leader

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Performance Profile/Performance Summary

- Leading international expert on power system dynamics, control, stability, transients, reliability, generation interconnection, and facility addition studies for the bulk power system with over **11 years** of industry experience. Authored multiple peer-reviewed articles in top journals and filed multiple patents in the United States, Germany, and China, demonstrating a strong ability to innovate and protect intellectual property across international jurisdictions.
- Deep understanding of emerging trends and technologies in power system dynamics, system operations, including renewable energy integration, electricity markets, grid modernization, and smart grid solutions, enabling the development of cutting-edge strategies and solutions. Nationally recognized for thought leadership in grid modernization planning and power system policy with active participation in PJM, MISO, NERC, NATF, IEEE, and other forums.
- Subject matter expertise in planning processes and multi-scenario analysis across transmission, distribution, and reliability/performance models/systems. Technical leader in all generation interconnection requirements and studies across multiple RTO footprints.
- Demonstrated history of working with cross-disciplinary research teams, policymakers, and external stakeholders. Strong collaboration skills, having successfully collaborated with cross-functional teams, industry partners, and regulatory bodies to drive standardization and best practices in power system planning, dynamics and control.
- Recognized utility technical leader with a thorough understanding of integrated, multi-scale energy system models, operational challenges associated with distributed energy resources integration at scale, and the evolving energy market, policy, and regulatory landscape.
- Proven background leading teams in stressful, deadline-oriented environments under budget and time constraints through the entire project lifecycle - project conceptualization, work planning, and project execution. Skilled in troubleshooting and solving a wide variety of electrical engineering issues while working on challenging assignments.

Technical Skills

Power System Simulation & Design PSS/E, TARA, DSATools, PSCAD, EMTP, PSLF, Powerworld, CYME, OpenDSS

Scientific Programming Python, MATLAB, R, LaTeX

Education

Ohio State University — *Columbus, OH United States*

Ph.D. candidate in Electrical Engineering — *2024-25 (Expected)*

University of Pennsylvania — *Philadelphia, PA United States*

M.S. in Electrical Engineering — *May 2018*

Professional Experience (Selected)

Electric Power Research Institute (EPRI) — *Remote: Dayton, OH, USA*

Technical Leader, Grid Ops & Planning (Knoxville, TN, USA) — *August 2024 - Present*

- Led multiple consulting & applied R&D projects for utilities across North America and aborad.

The AES Corporation - AES US Utilities — *Dayton, OH, USA*

Principal Engineer, Power System Adv. Studies — *May 2020 - August 2024*

- Led all power system advanced studies including power flow analysis, dynamics, transients, technical analysis of disturbances, implementation of regulatory reliability standards, and coordination of reliability and economic studies with the Regional Transmission Operator for AES Utilities in both Ohio and Indiana.
- Spearheaded and directed all Department of Energy (DoE) and other related research and development (R&D) initiatives for AES US Utilities, overseeing a portfolio of innovative projects aimed at advancing the energy sector.
- Provided subject matter expertise to more than 50 IPP projects in Ohio through feasibility, system impact, and facilities study phases working with internal engineering, operations, and the IPP developers through construction. Also developed industry-leading EMT modeling standard for AES Ohio's facilities interconnection requirement standard.
- Directed the work of consultants/partners related to transmission planning and distribution planning assessments including financial performance, operational performance, and quality of project deliverables. Facilitated the interconnection process of new delivery points for AES customers leading to multiple economic development projects in the Miami Valley region, Dayton OH, and in the greater Indianapolis region.
- Led the interconnection studies for generation and transmission requests, including providing technical expertise to modeling and transmission assessments. Led and provided key technical direction to the team on several large load addition projects with critical business impact.
- Provided subject matter expertise to AES Indiana's Integrated Resource Plan (IRP) 2023, optimizing the utilization of conventional generation resources and incorporating renewable energy technologies to meet corporate policy goals maintaining system reliability.

Ford Motor Company

Dearborn, MI, USA

Research Engineer, Advanced Electrical System Architecture — *Dec 2018 - June 2020*

- Accelerated Ford's future electrical architecture overall system design; functional architecture development; feature partitioning; and system-level interactions with power, control, networking, and electric distribution systems for iconic global nameplates - Mustang and F-150.
- Delivered subject matter expertise in high-voltage and low voltage electrical system design, including power net design, power distribution unit, wiring, and Electric Vehicle system architecture design.
- Directed and optimized the advanced EDS (Electrical Distribution System) assessment for the next-gen mild hybrids with Ford Europe, interfacing with multiple internal teams and outside suppliers. Played a key role in developing trade-off studies that improved operational efficiency and reduced EDS cost by approximately 10% percent, equating to over a million dollars in savings.
- Influenced cutting-edge research with external stakeholders in controls and robotics for Ford's next-gen manufacturing concept.
- Guided a three million dollar Department of Energy (DoE) project to develop a secure and reliable Electric vehicle fast-charging station architecture and deployment.

The Navy Yard, Philadelphia

Philadelphia, PA, USA

Systems Engineer — *May 2017 - Aug. 2017*

- Developed the design and engineering, project scope, technical oversight, and interconnection requirements for construction of a building-scale microgrid in the Philadelphia Navy Yard.
- Managed and provided technical expertise to a range of equipment implementations of distribution and communication technologies, including the installation and configuration of the microgrid controllers.
- Developed the curriculum and the associated instructor guides, provided subject matter expertise, and project management for the Energy Storage and Microgrid Training and Certification (ESAMTAC) program; the only national Energy Storage and Microgrid safety training program certified by the National Electrical Contractor's Association (NECA).

Indian Institute of Engineering Science & Technology

India

Senior Research Fellow & Project Fellow — *Aug. 2011 - July 2013*

- Developed and improved guided avionics algorithms in the areas of guidance, navigation, controls, estimation, and target tracking.
- Led the team through initial conceptual development, developed performance specifications, process requirements, layout complexity, managed overall cost and lead-time limits.
- Supported design reviews, analyses, simulations, and component/system testing to ensure delivery of products that exceeded customer requirements and expectations.
- Led the team in multiple design and code reviews; submitted classified reports to the funding agency detailing our findings and recommendations.
- Supported compliance audits conducted by internal and external agencies, participated and led stakeholder conversations, and also managed group workflows to meet cost and schedules.

Gammon India Ltd.

India

Engineer, Transmission & Distribution — *June 2010 - Aug 2011*

- Performed overall construction management and project coordination and prepared drum schedules, sag calculations, reviewed construction drawings and specifications for the installation of the Extra High Voltage 765 kV Eastern India transmission corridor project.
- Led project-specific schedules, progress reports; interfaced with vendors and suppliers, developed and presented project reports to all levels of management and external contractors.
- Monitored and reviewed construction installations and lead project construction meetings and discussions, providing mentorship and guidance to construction technicians through the project life-cycle.

Professional Affiliations

2024	**Professional Engineer (PE)**, Ohio	*United States*
2021	**Senior Member**, IEEE, IEEE-PES, IEEE Smart Grid Society	*United States*
2021	**Professional Member**, IEEE-HKN, Board of Governors	*United States*
2021	**Secretary**, IEEE-PES, Columbus Section	*United States*
2020	**MIE & Chartered Engineer**, The Institute of Engineers (IEI), India	*India*
2015	**Member**, The International Association of Engineers (IAENG)	*Hong Kong*