

Deepjyoti Deka

Research Scientist

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Summary

Dr. Deka is a staff scientist and project leader working in Machine Learning for smart grids and cyber-physical networks. His research leverages network physics and statistics to design certifiable algorithms for network identification, grid control and decarbonization.

Citizenship: India, **Permanent Residence:** USA

Education

2011 – 2015 **Ph.D. in Electrical & Computer Engineering**, *The University of Texas at Austin, Austin, TX.*

Dissertation: Analysis of the power grid: structure & secure operations.

Adviser: Prof. Sriram Vishwanath, (Communication and Networks Track).

2009 – 2011 **M.S. in Electrical & Computer Engineering**, *The University of Texas at Austin, Austin, TX.*

CGPA: 3.94/4.

2005 – 2009 **B.Tech. in Electronics & Comm. Engineering**, *Indian Institute of Technology (IIT) Guwahati, India.* CGPA: 9.58/10, **Institute Silver medal** for highest graduating CGPA in department.

Thesis: Power Control and Lifetime Maximization Techniques For Cooperative Communication.

Research Interests

Machine Learning: Graphical models, Deep learning, Time-series, Data-driven Optimization

Energy Systems: Cyber-security, Renewable integration, Optimization & Distributed control.

Awards and Achievements

2022 **Young Alumni Achiever Award**, IIT Guwahati, India.

2021 **Best Paper on ML Innovation** at ICML Workshop on Climate Change AI.

2015 **Best Conference Papers on Cyber Security, Stability, and Protection** at IEEE PES GM.

2015 **Student Leadership Award** by School of Engineering, University of Texas Austin.

2011 IEEE Communication Society **Student Travel Grant**.

2009 **Institute Silver Medal** for best graduating student in Electronics and Communication Engineering at IIT Guwahati.

2008 – 2009 **OP Jindal Engineering and Management scholarship** awarded to 25 students across India.

2006 – 2008 **Institute Merit Scholarship** in academic years 2006 – 07 and 2007 – 08 for securing first rank in the department at IIT Guwahati.

2003 **NTSE merit scholarship** for higher education, awarded by the Government of India.

2003 **Gold Medal**, Regional Mathematics Olympiad in Assam, India.

Professional Experience

July 2024 – **Research Scientist**, *MIT Energy Initiative, MIT*, Cambridge, Massachusetts,

present Working on new data-driven approaches to resilient operation of grid resources and decarbonization.

- July 2022 – **Scientist 3**, *Theoretical (T) Division, Los Alamos National Laboratory*, Los Alamos, New Mexico,
 July 2024 **Project:** PI/co-PI of multiple DOE and LANL projects on applications of machine learning in cyber-physical systems and infrastructure network optimization.
Mentoring: 3 postdocs, 25+ summer students
Technical Projects: (a) Machine Learning augmented optimization for power systems, (b) Robust neural-networks for network change detection and fault localization, (c) Control of interdependent infrastructure networks and natural systems for reliability.
- September 2018–June 2022 **Scientist 2**, *Theoretical (T) Division, Los Alamos National Laboratory*, Los Alamos, New Mexico,
Technical Projects: (a) Physics-informed machine learning for Topology and Parameter estimation, (b) Aggregated Control of flexible loads in power grids, (c) Learning for Cyber-Physical Systems.
- Dec. 2015 – **Postdoctoral Researcher**, *Center for Non-linear Studies (CNLS), Los Alamos National Laboratory*,
 Sept. 2018 Los Alamos, New Mexico. **Mentor:** Michael Chertkov, Theoretical (T) division..
- May– Aug. 2015, 2014 **Summer Intern**, *Theory Division, Los Alamos National Laboratory*, Los Alamos, New Mexico,
Project: Non-intrusive algorithm design to learn topology and consumption profiles in power grids.
- May 2013 – **Summer Intern**, *Electric Reliability Council of Texas (ERCOT)*, Taylor, Texas,
 August 2013 **Project:** Storage incorporation into ERCOT through the Fast Responding Regulation Service Pilot.
- May 2008 – **Summer Intern**, *Corporate R & D, Qualcomm Inc.*, San Diego, CA,
 July 2008 **Project:** Modeling and improvement in page download times over wireless networks.
- May 2007 – **Student Intern**, *Indian Institute of Sciences*, Bangalore, India,
 July 2007 **Project:** Analysis of optimum space-time power allocation policy for MIMO communication systems.

Pre-prints

- [P1] P. Pareek, K. Sundar, **D. Deka**, and Sidhant Misra. Optimization Proxies using Limited Labeled Data and Training Time: A Semi-Supervised Bayesian Neural Network Approach, *arXiv preprint*.
- [P2] P. Pareek, **D. Deka**, and Sidhant Misra. Fast Risk Assessment in Power Grids through Novel Gaussian Process and Active Learning, *arXiv preprint*.
- [P3] P. Pareek, **D. Deka**, and Sidhant Misra. Data-Efficient Power Flow Learning for Network Contingencies, *arXiv preprint*.
- [P4] A. Rayas, J. Cheng, R. Anguluri, **D. Deka**, and G. Dasarathy. Learning Networks from Wide-Sense Stationary Stochastic Processes, *arXiv preprint*.
- [P5] A. S. Bhadoriya, **D. Deka**, and K. Sundar. Equitable Routing: Rethinking the Multiple Traveling Salesman Problem, *arXiv preprint*.

Journal Publications

- [J33] R. Kannan, H. Nagarajan, and **D. Deka**. Strong Partitioning and a Machine Learning Approximation for Accelerating the Global Optimization of Nonconvex QCQPs, *INFORMS Journal on Computing (accepted)*, 2025.
- [J32] K. Sundar, **D. Deka**, and R. Bent Second-Order Cone Representable Model of Fairness for Decision-Making Problems, *Springer Optimization and Engineering (accepted)*, 2025.
- [J31] M. Mitrovic, A. Lukashevich, P. Vorobev, Y. Maximov, and **D. Deka**. Data-Driven Stochastic AC-OPF using Gaussian Processes, *International Journal of Electrical Power & Energy Systems*, 2023.
- [J30] A. Lukashevich, V. Gorchakov, P. Vorobev, **D. Deka**, and Y. Maximov. Importance sampling approach to chance-constrained DC optimal power flow, *IEEE Transactions on Control of Network Systems*, 2023.
- [J29] W. Li, **D. Deka**, R. Wang, and M. Paternina. Perturbation-Robust Neural Networks for Stochastic Power Grids, *IEEE Transactions on Artificial Intelligence*, 2023.
- [J28] **D. Deka**, V. Kekatos, and G. Cavraro. Learning Distribution Grid Topologies: A Tutorial, *IEEE Transactions on Smart Grid*, 2022.
- [J27] U. Hashmi, **D. Deka**, A. Basic, and D. V. Hertem. Locational impact of prosumer energy optimization with distribution network inverter rules, *IEEE Transactions on Power Systems*, 2022.

- [J26] G. Peng, R. Mieth, **D. Deka**, and Y. Dvorkin. Markovian Decentralized Ensemble Control for Demand Response, *IEEE Control Systems Letters*, 2022.
- [J25] S Gupta, S Misra, **D. Deka**, and V. Kekatos. DNN-based Policies for Stochastic AC Optimal Power Flow, *Journal of Electric Power Systems Research (EPSR), special issue on Power Systems Computation Conference (PSCC)*, 2022.
- [J24] V.R. Subramanian, **D. Deka**, S. Talukdar, A. Lamperski, and M. Salapaka. Topology Learning in Radial Dynamical Systems with Unreliable Data, *IEEE Transactions on Control of Network Systems*, (accepted).
- [J23] **D. Deka**, D. Harish, S. Misra, and M. Salapaka. Tractable learning in under-excited power grids, *IEEE Transactions on Control of Network Systems*, 2021.
- [J22] A. Hassan, **D. Deka**, and Y. Dvorkin. Privacy-Aware Load Ensemble Control: A Linearly-Solvable MDP Approach, *IEEE Transactions on Smart Grid*, 2021.
- [J21] S. Bhela, H. Nagarajan, **D. Deka**, and V. Kekatos. Efficient Topology Design Algorithms for Power Grid Stability, *IEEE Control Systems Letters*, 2021.
- [J20] M. Bariya, **D. Deka**, and A. von Meier. Guaranteed Phase & Topology Identification in Three Phase Distribution Grids, *IEEE Transactions on Smart Grid*, 2021.
- [J19] N. Stulov, D. Sobajic, Y. Maximov, **D. Deka**, and M. Chertkov. Learning Model of Generator from Terminal Data , *Journal of Electric Power Systems Research (EPSR), special issue on Power Systems Computation Conference (PSCC)*, 2020.
- [J18] I. Carreno, A. Scaglione, A. Zlotnik, **D. Deka**, and K. Sundar. An Adversarial Model for Attack Vector Vulnerability Analysis on Power and Gas Delivery Operations, *Journal of Electric Power Systems Research (EPSR), special issue on Power Systems Computation Conference (PSCC)*, 2020.
- [J17] I. Mezghani, S. Misra, and **D. Deka**. Stochastic AC Optimal Power Flow: A Data-Driven Approach, *Journal of Electric Power Systems Research (EPSR), special issue on Power Systems Computation Conference (PSCC)*, 2020.
- [J16] A. Hassan, **D. Deka**, M. Chertkov, and Y. Dvorkin. Data-Driven Learning and Load Ensemble Control, *Journal of Electric Power Systems Research (EPSR), special issue on Power Systems Computation Conference (PSCC)*, 2020.
- [J15] A. Hasan, R. Mieth, **D. Deka**, and Y. Dvorkin. Stochastic and Distributionally Robust Load Ensemble Control, *IEEE Transactions on Power Systems*, 2020.
- [J14] A. Hasan, S. Acharya, M. Chertkov, **D. Deka**, and Y. Dvorkin. A Hierarchical Approach to Multienergy Demand Response: From Electricity to Multienergy Applications, *Proceedings of the IEEE*, 2020.
- [J13] **D. Deka**, S. Talukdar, M. Chertkov, and M.V. Salapaka. Graphical Models in Loopy Distribution Grids: Topology estimation, change detection and limitation, *IEEE Transactions on Smart Grid*, 2020.
- [J12] U. Hashmi, **D. Deka**, L. Pereira, A. Basic, and S. Backhaus. Arbitrage with Power Factor Correction using Energy Storage, *IEEE Transactions on Power Systems*, 2020.
- [J11] S. Park, **D. Deka**, S. Backhaus, and M. Chertkov. Learning with End-Users in Distribution Grids: Topology and Parameter Estimation, *IEEE Transactions on Control of Network Systems*, 2020.
- [J10] **D. Deka**, M. Chertkov, and S. Backhaus. Joint Estimation of Topology and Injections in Distribution Grids with Missing Nodes, *IEEE Transactions on Control of Network Systems*, 2020.
- [J9] S. Talukdar, **D. Deka**, H. Doddi, D. Materassi, M. Chertkov, and M.V. Salapaka. Physics Informed Topology Learning in Networks of Linear Dynamical Systems, *Automatica*, 2020.
- [J8] W. Li, **D. Deka**, M. Chertkov, and M. Wang. Real-time Fault Localization in Power Grids With Convolutional Neural Networks, *IEEE Transactions on Power Systems*, 2019.
- [J7] M. Jalali, V. Kekatos, N. Gatsis, and **D. Deka**. Designing Reactive Power Control Rules for Smart Inverters using Support Vector Machines, *IEEE Transactions on Smart Grid*, 2019.
- [J6] **D. Deka**, M. Chertkov, and S. Backhaus. Topology Estimation using Graphical Models in Multi-Phase Power Distribution Grids, *IEEE Transactions on Power Systems*, 2019.
- [J5] A. Hasan, R. Mieth, **D. Deka**, M. Chertkov, and Y. Dvorkin. Optimal Load Ensemble Control in Chance-Constrained Optimal Power Flow, *IEEE Transactions on Smart Grid*, 2018.

- [J4] **D. Deka**, S. Vishwanath, and R. Baldick. Topological Vulnerability of Power Grids to Disasters: Bounds, Adversarial attacks and Reinforcement, *PLoS one*, 2018.
- [J3] C Grudzien, **D. Deka**, M Chertkov, and S. Backhaus. Structure & Physics-Preserving Reductions of Power Grid Models, *SIAM Multiscale Modeling & Simulation*, 2018.
- [J2] **D. Deka**, M. Chertkov, and S. Backhaus. Structure Learning in Power Distribution Networks, *IEEE Transactions on Control of Network Systems*, 2017.
- [J1] **D. Deka**, S. Vishwanath, and R. Baldick. Analytical Models for Power Networks: The case of the Western US and ERCOT grids, *IEEE Transactions on Smart Grid*, 2017.

Book Chapters/Reports

- [B6] R. Arghandeh, M. Bariya, G. Cotter, **D. Deka** S. A. R. Konakalla, Y. Seyedi, et al. Synchronized Measurements and their Applications in Distribution Systems: An Update, *White paper by Distribution task team, North American SynchroPhasor Initiative (NASPI)*, 2020.
- [B5] E. Stewart, K. Chellappan, S. Backhaus, **D. Deka**, et al. Integrated Multi Scale Data Analytics and Machine Learning for the Grid; Benchmarking Algorithms and Data Quality Analysis, in *Report No. LLNL-TR-763938*, Lawrence Livermore National Lab.(LLNL), Livermore, CA (United States), 2018.
- [B4] R. Arghandeh, K. Brady, M. Brown, G.R. Cotter, **D. Deka** et al. Synchrophasor Monitoring for Distribution Systems: Technical Foundations and Applications, *White paper by Distribution task team, North American SynchroPhasor Initiative (NASPI)*, 2018.
- [B3] M. Chertkov, V.Y. Chernyak, and **D. Deka**. Ensemble Control of Cycling Energy Loads: Markov Decision Approach, in *Energy Markets and Responsive Grids: Modeling, Control and Optimization*, S. Meyn, T. Samad, S. Glavaski, I. Hiskens, and J. Stoustrup (Eds.), Springer, 2018.
- [B2] E. Stewart, V Hendrix, M Chertkov, and **D. Deka**. Integrated multi-scale data analytics and machine learning for the distribution grid and building-to-grid interface, in *Report No. LLNL-TR-727125*, Lawrence Livermore National Lab.(LLNL), Livermore, CA (United States), 2017.
- [B1] **D. Deka** and M. Chertkov. Topology Learning in Radial Distribution Grids, in *Big Data Application in Power Systems*, R. Arghandeh and Y. Zhou (Eds.), Elsevier, 2017. Chap. 12, pp. 261-279.

Conference Publications (peer-reviewed)

- [C52] P. Pareek, K. Sundar, **D. Deka**, and Sidhant Misra. Learning from Less: Bayesian Neural Networks for Optimization Proxy using Limited Labeled Data, *NeurIPS Workshop on Bayesian Decision-making and Uncertainty*, 2024.
- [C51] M.S. Veedu, **D. Deka**, and M. Salapaka. Information Theoretically Optimal Sample Complexity of Learning Dynamical Directed Acyclic Graphs, *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2024.
- [C50] Y. Zhou, K. Sundar, H. Zhu, and **D. Deka**. Mitigating the Impact of Uncertain Wildfire Risk on Power Grids through Topology Control, *International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)*, 2024.
- [C49] Y. Chen, **D. Deka**, and Y. Shi. Contributions of Individual Generators to Nodal Carbon Emissions, *ACM e-Energy*, 2024.
- [C48] M. Mitrovic, A. Lukashevich, P. Vorobev, V. Terzija, Y. Maximov, and **D. Deka**. Data-Driven Chance Constrained AC-OPF using Hybrid Sparse Gaussian Processes, *Powertech*, 2023.
- [C47] W. Li and **D. Deka**. PPGN: Physics-Preserved Graph Networks for Real-Time Fault Location in Distribution Systems with Limited Observation and Labels, in *Hawaii International Conference on System Sciences (HICSS)*, 2023.
- [C46] H. Doddi, **D. Deka**, S. Talukdar, and M. Salapaka. Learning Networked Linear Dynamical Systems under Non-white Excitation from a Single Trajectory, in *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2022.
- [C45] M. Kamal, W. Li, **D. Deka**, H. Mohsenian-Rad. Physics-Conditioned Generative Adversarial Networks for State Estimation in Active Power Distribution Systems with Low Observability, in *IEEE International Conference on Smart Grid Synchronized Measurements and Analytics*, 2022.

- [C44] S. Sontowski, N. Lawrence, **D. Deka**, and M. Gupta. Detecting Anomalies using Overlapping Electrical Measurements in Smart Power Grids, in *IEEE International Conference on Big Data*, 2021.
- [C43] W. Li and **D. Deka**. Physics-Informed Graph Neural Networks for Robust Fault Location in Power Grids, in *ICML Workshop on Tackling Climate Change with Machine Learning*, 2021. (**Best paper: ML Innovation**).
- [C42] C. Hannon, **D. Deka**, D. Jin, M. Vuffray, and A.Y. Lokhov. Real-time anomaly detection and classification in streaming PMU data, in *IEEE Powertech*, 2021.
- [C41] W. Li and **D. Deka**. Physics-Informed Learning for High Impedance Faults Detection, in *IEEE Powertech*, 2021.
- [C40] I.L. Carreno, A. Scaglione, A. Giacomoni, K. Sundar, **D. Deka**, and A. Zlotnik. Using Transient Pipeline Simulation to Evaluate Electric Power Generation Reliability, in *PSIG Annual Meeting*, 2021.
- [C39] H. Doddi, **D. Deka**, and M.V. Salapaka. Learning partially observed meshed distribution grids, *International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)*, 2020. (**finalist for best student paper**).
- [C38] U. Hashmi, **D. Deka**, L. Pereira, and A. Basic. Energy Storage Optimization for Grid Reliability, *Workshop on Energy Storage, International Conference on Future Energy Systems (ACM e-energy)*, 2020.
- [C37] U. Hashmi, **D. Deka**, L. Pereira, A. Basic, and S. Backhaus. Co-optimizing Energy Storage for Prosumers Using Convex Relaxations, in *International Conference on Intelligent Systems Applications to Power Systems*, 2019.
- [C36] **D. Deka**, and S. Misra. Learning for DC-OPF: Classifying active sets using neural nets, in *IEEE Powertech*, 2019.
- [C35] Y Chen, U. Hashmi, **D. Deka**, and M. Chertkov. Stochastic Battery Operations using Deep Neural Networks, in *IEEE Innovative Smart Grid Technologies Conference (ISGT)*, 2019.
- [C34] S. Bhela, **D. Deka**, H. Nagarajan, and V. Kekatos. Designing Power Grid Topologies for Minimizing Network Disturbances: An Exact MILP Formulation, in *IEEE American Control Conference (ACC)*, 2019.
- [C33] H. Doddi, S. Talukdar, **D. Deka**, and M.V. Salapaka. Exact Topology Learning in a Network of Cyclostationary Processes, in *IEEE American Control Conference (ACC)*, 2019.
- [C32] S. Park, **D. Deka**, and M. Chertkov. Learning in power distribution grids under correlated injections, in *Asilomar Conference on Signals, Systems and Computers*, 2018.
- [C31] Y Chen, Y Tan, and **D. Deka**. Is Machine Learning in Power Systems Vulnerable?, in *IEEE Smartgridcomm*, 2018.
- [C30] H. Doddi, S. Talukdar, **D. Deka**, and M.V. Salapaka. Data-driven identification of thermal network of multi-zone building, in *IEEE Control and Decision Conference (CDC)*, 2018.
- [C29] A.Y. Lokhov, **D. Deka**, M. Vuffray, and M. Chertkov. Learning of Power Transmission Dynamics from Partial PMU Observations, in *IEEE Control and Decision Conference (CDC)*, 2018.
- [C28] S. Park, **D. Deka**, and M. Chertkov. Exact Topology and Parameter Estimation in Distribution Grids with Minimal Observability, in *Power Systems Computation Conference (PSCC)*, 2018.
- [C27] A.Y. Lokhov, M. Vuffray, D. Shemetov, **D. Deka**, and M. Chertkov. Online Learning of Power Transmission Dynamics, in *Power Systems Computation Conference (PSCC)*, 2018.
- [C26] M. Chertkov, **D. Deka**, and Y. Dvorkin. Optimal Ensemble Control of Loads in Distribution Grids with Network Constraints, in *Power Systems Computation Conference (PSCC)*, 2018.
- [C25] A. Hasan, Y. Dvorkin, **D. Deka**, and M. Chertkov. Chance-constrained ADMM approach for decentralized control of distributed energy resources, in *Power Systems Computation Conference (PSCC)*, 2018.
- [C24] S. Talukdar, **D. Deka**, M. Chertkov, and M.V. Salapaka. Topology Learning of Radial Dynamical Systems with unobserved Nodes, in *IEEE American Control Conference (ACC)*, 2018.
- [C23] S. Talukdar, **D. Deka**, S. Attree, D. Materassi, and M.V. Salapaka. Learning the Exact Topology of Undirected Consensus Networks, in *IEEE Control and Decision Conference (CDC)*, 2017.

- [C22] E. Stewart, **D. Deka**, V. Hendrix, M. Chertkov, et al. Integrated Multi-Scale Data Analytics and Machine Learning for the Distribution Grid and Building-to-Grid Interface, in *IEEE International Conference on Smart Grid Communications (SmartGridComm)*, 2017.
- [C21] **D. Deka**, M. Chertkov, and S. Backhaus. Estimating Topology and Injection Statistics in Power Grids, in *IEEE International Conference on Smart Grid Communications (SmartGridComm)*, 2017.
- [C20] **D. Deka**, S. Talukdar, M. Chertkov, and M.V. Salapaka. Topology estimation in bulk power grids: Guarantees on exact recovery, in *IREP Bulk Power Symposium*, 2017.
- [C19] S. Talukdar, **D. Deka**, B. Lundstrom, M. Chertkov, and M.V. Salapaka. Learning Exact Topology of a Loopy Power Grid from Ambient Dynamics, in *International Conference on Future Energy Systems (ACM e-energy)*, 2017.
- [C18] S. Talukdar, **D. Deka**, D. Materassi, and M.V. Salapaka. Exact topology reconstruction of radial dynamical systems with applications to distribution system of the power grid, in *IEEE American Control Conference (ACC)*, 2017.
- [C17] **D. Deka**, H. Nagarajan, and S. Backhaus. Optimal Topology Design for Disturbance Minimization in Power Grids, in *IEEE American Control Conference (ACC)*, 2017.
- [C16] **D. Deka**, A. Zare, A.Y. Lokhov, M. Jovanovic, and M. Chertkov. State and noise covariance estimation in power grids using limited nodal pmus, in *IEEE GlobalSIP*, 2017.
- [C15] **D. Deka**, M. Chertkov, and S. Backhaus. Tractable structure learning in radial physical flow networks, in *IEEE Control and Decision Conference (CDC)*, 2016.
- [C14] **D. Deka**, M. Chertkov, and S. Backhaus. Learning topology of distribution grids using only terminal node measurements, in *IEEE SmartGridComm*, 2016.
- [C13] **D. Deka**, M. Chertkov, and S. Backhaus. Learning topology of the power distribution grid with and without missing data, in *European Control Conference (ECC)*, 2016.
- [C12] **D. Deka**, M. Chertkov, and S. Backhaus. Estimating distribution grid topologies: A graphical learning based approach, in *Power Systems Computation Conference (PSCC)*, 2016.
- [C11] **D. Deka**, S. Vishwanath, and R. Baldick. Jamming aided generalized data attacks: exposing vulnerabilities in secure estimation, in *Hawaii International Conference on System Sciences (HICSS)*, 2016.
- [C10] **D. Deka**, S. Vishwanath, and R. Baldick. Optimal data attacks on power grids: Leveraging detection & measurement jamming, in *IEEE International Conference on Smart Grid Communications (SmartGridComm)*, 2015.
- [C9] **D. Deka**, S. Vishwanath, and R. Baldick. One breaker is enough: hidden topology attacks on power grids, in *IEEE PES General Meeting*, 2015. (**best Conference papers on Cyber Security, Stability, and Protection**).
- [C8] **D. Deka** and S. Vishwanath. Structural vulnerability of power grids to disasters: Bounds and reinforcement measures, in *IEEE Innovative Smart Grid Technologies Conference (ISGT)*, 2015.
- [C7] **D. Deka**, S. Vishwanath, and R. Baldick. Data attacks on power grids: Leveraging detection, in *IEEE Innovative Smart Grid Technologies Conference (ISGT)*, 2015.
- [C6] **D. Deka**, S. Vishwanath, and R. Baldick. Data attack on strategic buses in the power grid: Design and protection, in *IEEE PES General Meeting*, 2014.
- [C5] **D. Deka**, S. Vishwanath, and R. Baldick. Attacking power grids with secure meters: The case for breakers and jammers, in *IEEE INFOCOM Communications Workshop*, 2014.
- [C4] **D. Deka**, S. Vishwanath, and R. Baldick. Optimal hidden SCADA attacks on power grid: A graph theoretic approach, in *International Conference on Computing, Networking and Communications (ICNC)*, 2014.
- [C3] **D. Deka** and S. Vishwanath. Generative models for cellular social networks, in *International Conference on Computing, Networking and Communications (ICNC)*, 2014.
- [C2] **D. Deka** and S. Vishwanath. Generative growth model for power grids, in *International Conference on Signal-Image Technology & Internet-Based Systems (SITIS)*, 2013.
- [C1] **D. Deka** and S. Vishwanath. PMU placement and error control using belief propagation, in *IEEE International Conference on Smart Grid Communications (SmartGridComm)*, 2011.

Invited Talks

- Dec 2024 "Realistic Learning in Power Distribution Grids: a physics-informed machine learning perspective", *Analog Devices, Boston*.
- Dec 2024 "Parametric Models of Fairness for Decision-Making Problems: from power systems to vehicle routing and prices", *LIDS Climate Tea Talk*.
- Nov 2024 "Fast data-driven Optimization and Risk estimation using limited data in power grids", *Energy & Infrastructure Systems Group (EIMC2) seminar*.
- Sep 2024 "Data-Driven Optimization Using Limited Data", *Autonomous Energy Systems Workshop, NREL*.
- July 2024 "Gaussian Process for Risk estimation in Power Grids", *IEEE PES-GM*.
- March 2023 "Realistic estimation in power grids", *Energy Systems Innovation Center Seminar, Washington State University(virtual)*.
- February 2023 "Tractable Learning in Dynamical Systems excited by Colored non-white inputs", *SIAM CSE, Amsterdam, Netherlands*.
- October 2022 "Data-driven Improvements for Stochastic AC-OPF", *INFORMS, Indianapolis, USA*.
- January 2022 "Physics Informed Statistical Machine Learning for Distribution Grid Estimation", *IEEE PES Webinar on Advancement of Machine Learning aided Power System State Estimation (virtual)*.
- August 2020 "Data-driven stochastic optimization in power grids with safety guarantees", *IEEE PES-GM (virtual)*.
- August 2020 "Statistically Optimal Learning of Topology and Line Impedances in Distribution Grids under Correlated Loads", *IEEE PES-GM (virtual)*.
- June 2020 "Provable estimation in distribution grids: a physics-informed statistical learning perspective", *IEEE PES Subcommittee on Big Data & Analytics: Virtual Tutorial series*.
- Dec 2019 "Learning and Control from Fluctuations in Distribution grids", *Department Seminar, IIT Bombay and IIT Guwahati, India*.
- October 2019 "Faulted Line Localization And PMU Placement in Power Systems", *INFORMS, Seattle, USA*.
- August 2019 "Data Analytics in Power Grids: Tractable Algorithms", *DSI Workshop, Livermore, USA*.
- June 2019 "Estimation and Optimization in Power Grids: a data-driven approach", *INRIA, Paris, France*.
- May 2019 "Learning and Control from Fluctuations in Distribution grids: Graphs, Buildings and MDPs", *Control Seminar, University of Minnesota Twin Cities, Minneapolis, USA*.
- February 2019 "Efficient Estimation in distribution grids", *Invited session, ISGT, Washington DC, USA*.
- April 2019 "Data Analytics in Power Grids: Tractable Algorithms & Path Forward", *NASPI, San Diego, USA*.
- Nov 2018 "Joint structure and parameter estimation in power distribution under limited observability", *INFORMS, Phoenix, USA*.
- August 2018 "Joint structure and parameter estimation in power distribution under limited observability", *IEEE PES-GM, Portland, USA*.
- July 2018 "Learning and Control in Distribution grids", *MOPTA, Lehigh University, USA*.
- July 2018 "Learning with end-users in distribution grids", *International Symposium on Mathematical Programming (ISMP), Bordeaux, France*.
- June 2018 "Power Grid Informed & Measurement Based Machine Learning", *International Conference on Probabilistic Methods Applied to Power Systems (PMAPS), Boise, USA*.
- March 2018 "Learning and Control from Fluctuations in Grids: Graphs, Buildings and MDPs ", *Lawrence Berkeley National Laboratory, Berkeley, USA*.
- Sept. 2017 "Learning in Linear Dynamical Systems", *INRIA, Paris, France*.
- August 2017 "Learning the Network of a Linear Dynamical System from Ambient Fluctuations: Application to Power Grid Dynamics", *Automatic Control Laboratory, ETH, Zurich, CH*.
- March 2017 "Topology Learning in Power Grids from Ambient Dynamics", *Banff Workshop on Optimization and Inference for Physical Flows on Networks, Banff, Canada*.
- January 2017 "Learning and Control in Physical Flow Networks", *INFORMS ICS Conference, Austin, USA*.
- January 2017 "Topology Learning in Power Grids from Ambient Fluctuations", *Grid Science Winter School & Conference, Santa Fe, USA*.

- Nov. 2016 “Machine Learning in Power Grids”, *Australian National University (ANU)*, Canberra, AU.
- June 2016 “Machine Learning in Distribution Networks: Estimation and Security”, *INFORMS International Conference*, Kona, Hawaii, USA.
- May 2016 “Machine Learning Problems in Power Grids”, *Pacific Northwest National Laboratory*, Seattle, USA.
- April 2016 “Power Grid Big Data Research at LANL”, *Smart Grid Workshop*, Texas A&M University, TX, USA.
- January 2016 “Learning and Estimation Problems in Radial Distribution Networks”, *Physics Informed Machine Learning Conference*, Santa Fe, USA.

Project Leadership

- 2022 –2025 co-PI, **LANL Laboratory Directed Research & Development Grant on** Machine Learning for Non-convex Optimization, *Funding: 1 million USD.*
- 2021 – 2024 PI, **LANL Laboratory Directed Research & Development Grant on** Resilient operation of interdependent engineered networks and natural system, *Funding: 1 million USD.*
- 2020 –2023 LANL co-PI, **US Department of Energy Advanced Grid Modeling Grant on** Machine Learning for Stochastic Optimization, *Funding: 1.3 million USD.*
- 2020 –2023 LANL co-PI, **US Department of Energy Advanced Grid Modeling Grant on** Real-Time Control of Large-Scale Power Grids, *Funding: 2.5 million USD.*
- 2018 – 2021 co-PI, **LANL Laboratory Directed Research & Development Grant on** Statistical Machine Learning for Cyber-Physical Systems, *Funding: 900k USD.*
- 2018 – 2019 co-PI, **US Department of Energy GMLC Grant on** Machine Learning for Distribution Systems, *Funding: 240k USD .*

Student Leadership

- 2013 – 2015 **Director of Academic Affairs** and **Executive member** of Graduate Student Assembly, The University of Texas at Austin for academic years 2013-2014 and 2014-2015.
- 2013 – 2014 Member of **President’s Student Advisory Council** and **Provost’s Student Advisory Council**, The University of Texas at Austin.
- 2012 – 2013 Member of Graduate School’s **Dean’s Student Advisory Council** and **Student Senate**, The University of Texas at Austin.
- 2008 – 2009 Member of **Technical Board of Student Senate**, IIT Guwahati.

Software Skills

- Software MATLAB, PYTHON, JULIA, GUROBI, IPOPT, POWERWORLD, WIRESHARK, TENSORFLOW
- Certification Coursera Deep Learning Specialization

Professional Service

- Associate Editor IEEE Transactions on Smart Grid (2021-2022)
- TPC Member IEEE Smartgridcomm 2020, 2019, 2018, PMAPS 2020, IEEE GlobalSIP 2019, 2018, 2017, 2016
- Organizer Workshop on Machine Learning in Distribution Grids in IEEE Smartgridcomm 2020, Control and Demand Response in Smart Grids session (CDC 2019), Cyber-Physical Resilience in Smart Grids session (Resilience Week 2019), LANL Grid Science Winter School (2017,2019,2021) Machine Learning in Power Grid sessions (ISMP 2018), Energy session (MOPTA 2018) PMU analytics session (INFORMS 2017), LANL Physics Informed Machine Learning Conference 2016

Reviewer **Journal:** IEEE Proceedings, IEEE Access, IEEE Transactions on Power Systems, Transactions on Smart Grid, Transactions on Automatic Control, Transactions on Control of Network Systems, Transactions of Signal Processing, Transactions on Network Science and Engineering, IET Cyber-Physical Systems, IET Generation, Transmission & Distribution, Sustainable Energy-Grids and Networks, Journal of Electrical Power and Energy Systems, Sensors
Conference: IEEE CDC, ACC, CCTA, ECC, PSCC, SmartGridComm, ISIT, PES GM, ISGT, CAMSAP, SECON, GlobalSIP

References

Available upon request