

Gayathri KRISHNAMOORTHY

Energy Researcher| Software Developer

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Power Systems Engineer with 7+ years of experience as a researcher and software developer at National Laboratories. Worked on several projects developing integration theories, distributed energy resource (DER) models, and software tools to efficiently integrate renewable energy resources to the power grid while making them a significant player in energy markets. I am outgoing, creative, and detail-oriented with strong engineering basics and communication skills. I am effective both solo or on a team. In my spare time I practice yoga, dance, and painting. I am also passionate about journalism and the brain science behind mindfulness practice.

PROFESSIONAL EXPERIENCE

Present Jan 2022	Researcher, NATIONAL RENEWABLE ENERGY LABORATORY (NREL), Golden, CO <ul style="list-style-type: none">> Working with disadvantaged community members in Los Angeles for achieving more equitable outcomes in the distribution of benefits and burdens for distribution grid reliability and resilience in LA's transition to 100% clean energy.> Investigating challenges and opportunities of integrating higher shares of solar and electric vehicles for the Port Authority of New York/New Jersey's distribution circuit/feeders.> Developing federated machine learning architecture to help understand and mitigate the cyber security and physical security issues of DER aggregators in power distribution network.> Involved in assessments of the distribution grid level requirements on a lab wide effort to present to the U.S. congress on current state and evolution of cybersecurity needs for the power grid.> Developing an atlas of representative and synthetic distribution grid infrastructure models for the continental U.S. using licensed and open source geospatial data hosted by multiple utilities and cloud platforms. <p>Julia Python Matlab SQLite C++</p>
Dec 2021 Aug 2016	Graduate Research Assistant, WASHINGTON STATE UNIVERSITY, Pullman, WA <ul style="list-style-type: none">> Developed imitation learning based improvements to incorporate the physics of power distribution grid models in data driven solution approaches (deep reinforcement learning models).> Developed efficient regulation market techniques to enable transmission level frequency regulation service provision using distribution connected battery energy storage systems.> Developed numerical methods to demonstrate the solver based convergence of transmission and distribution grid co-simulation platform.> Developed a performance optimization market model for the impact assessment of demand-side renewable resource participation and its integration into the wholesale market. <p>Python MATLAB OpenDSS Tensorflow Keras</p>
May - Aug 2020 May - Dec 2018	Graduate Research Intern, PACIFIC NORTHWEST NATIONAL LABORATORY, Seattle, WA <ul style="list-style-type: none">> Developed deep reinforcement learning models to perform AC optimal power flow for the power transmission system optimization.> Assisted in development of a transactive energy software agent, TESP, that optimizes the dynamics of distributed energy resources in a household to provide monetary benefits to the costumers with EVs, batteries, and PVs.> Performed scalability testing for the open source co-simulation platform (HELICS) in multiple environments.> Developed docker environment for a microgrid restoration application with HELICS. <p>C++ MATLAB OpenDSS Docker Python</p>

EDUCATION

May 2022 Jan 2019	Ph.D. in Electrical Engineering , WASHINGTON STATE UNIVERSITY, Pullman, WA <ul style="list-style-type: none">> Research : Learning Method based Enhancements to enable Frequency Regulation Service Provision from Distribution Connected Energy Storage Systems> Major : Power Systems> Minor : Computer Science
May 2018 Aug 2016	M.S. in Electrical Engineering, WASHINGTON STATE UNIVERSITY, Pullman, WA <ul style="list-style-type: none">> Research : An Iterative Co-simulation Framework for the Integrated Transmission and Distribution System Analysis> Major : Power Systems> Minor : Computer Engineering
May 2016 Aug 2012	B.E. in Electronics and Communications Engineering, ANNA UNIVERSITY, Chennai, India <ul style="list-style-type: none">> Title : Smart Home Design with Voice Recognition in a Single Controller (Arduino Uno) Environment> Major : Embedded Systems> Minor : Communications

PROGRAMMING SKILLS

Python	● ● ● ● ●
Julia	● ● ● ● ○
MATLAB	● ● ● ● ●
C++	● ● ● ● ○
SQLite	● ● ● ● ○

SIMULATION TOOLS

- > VSCode
- > Tensorflow
- > Docker
- > HPC
- > AWS

OFFICE SKILLS

- > LaTeX
- > MS Presentation
- > MS Excel
- > MS Visio

RESEARCH ARTICLES

- 2022 G. Krishnamoorthy, A. Dubey and A. Gebremedhin, "An Open-source Environment for Reinforcement Learning in Power Distribution Systems," in 2022 IEEE Power & Energy Society General Meeting (PESGM).
- 2021 G. Krishnamoorthy, A. Dubey and A. Gebremedhin "Reinforcement Learning for Battery Energy Storage Dispatch augmented with Model-based Optimizer," in IEEE SmartGridComm 2021.
- 2019 G. Krishnamoorthy and A. Dubey, "Transmission-Distribution Cosimulation : Analytical Methods for Iterative Coupling," in IEEE Systems Journal 2019.
- 2019 J. C. Bedoya, C. Liu, G. Krishnamoorthy and A. Dubey, "Bilateral Electricity Market in a Distribution System Environment," in IEEE Transactions on Smart Grid 2019.
- 2019 Sen, P.K., Velaga, Y.N., Chen, A., Krishnamoorthy, G. and Dubey, A., 2019, "Advancements in Co-Simulation Techniques in Combined Transmission & Distribution Systems Analysis," in The Journal of Engineering 2019.

PROFESSIONAL ACTIVITIES

- Present Serving as a Global Graduate Students Team Lead at the Society of Women Engineers
- Present Serving as a reviewer for IEEE Power and Energy Society Conferences, Institution of Engineering and Technology Journals, and IEEE Systems Journal
- 2020 Participated in WCCI and NeurIPS 2020 learning to run power network challenges
- 2016-Present Paper and Poster Presentations- IEEE PES General Meeting, Power Systems Engineering Research Center

HONORS AND AWARDS

- 2022 **Awardee** Best Conference Paper at IEEE Power and Energy Society General Meeting
- 2020 **1st Place** 3-Minute Thesis Competition at WSU Electrical Engineering and Computer Science Department
- 2019, 2020 **Awardee** Graduate & Professional Student Association Scholarship for the Research Exposition
- 2018 **2nd Place** Best Student Paper Award at North American Power Symposium