

Gayathri Krishnamoorthy

ENERGY RESEARCHER | SOFTWARE DEVELOPER
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Power Systems Engineer with 6+ years of experience as a researcher and software developer at National Laboratories and Washington State University. Worked on several projects developing theories, models, and software tools to efficiently integrate renewable energy resources 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.

Education

Washington State University

Pullman, WA

PH.D. IN ELECTRICAL ENGINEERING – Major - Power Systems, Minor - Computer Science

Jan 2019 - May 2022

- **Dissertation Title** — Frequency Regulation Market Service Provision from Distribution Connected Battery Energy Storage Systems

Washington State University

Pullman, WA

M.S. IN ELECTRICAL ENGINEERING – Major - Power Systems, Minor - Computer Engineering

Aug 2016 - May 2018

- **Thesis Title** — Distributed Energy Resource Impact Analysis on Integrated Transmission and Distribution System

Experience

National Renewable Energy Laboratory

Golden, CO

RESEARCHER

Jan 2022 - Present

- Developing synthetic distribution grid infrastructure layer for the continental U.S. using licensed and open source geospatial data hosted by multiple utilities and cloud platforms.
- Developing an upgrade cost database framework to evaluate the power system level operational violations with the increasing integration of fast charging electric vehicle (EV) stations and proposing least cost optimal grid upgrades.
- Leading the writing on a lab wide effort to present to the U.S. congress on current state and evolution of cybersecurity needs for the power distribution grid.

Washington State University

Pullman, WA

GRADUATE RESEARCH ASSISTANT

Aug 2016 - Dec 2021

- 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 an optimal retail market model and performed impact assessment of demand-side renewable resource participation and its integration into the wholesale market.

Pacific Northwest National Laboratory

Seattle, WA

GRADUATE RESEARCH INTERN

May, '18 - Dec, '18, May, '20 - Aug, '20

- Developed deep reinforcement learning models to perform AC optimal power flow for the power transmission system optimization.
- Assisted in development of an open-source transactive energy software agent, TESP, to optimize the dynamics of distributed energy resources.
- Performed real-time testing of TESP using HELICS along with multiple power system energy market components.
- Developed docker environment for a power microgrid restoration application.

Research Projects

DISTRIBUTION GRID COST UPGRADE TOOL

2022

- I am developing multiple features (optimal cost functions, grid scaling, etc) within this distribution grid upgrade cost tool to perform integration and upgrade studies with increasing solar, electric vehicle, and extreme fast charging stations for the bay area grid.

LONG DURATION ENERGY STORAGE ANALYSIS

2022

- I am developing large scale test systems using SIIP to analyze and test different capacity expansion models for long duration energy storage devices in the light of increasing solar and wind renewable resources.

MODEL-BASED AND MODEL-FREE DISTRIBUTION SYSTEM OPTIMIZATION USING DEEP REINFORCEMENT LEARNING

2021

- I developed an optimization strategy (model-based) and DRL techniques (model-free) to distribute the frequency regulation dispatch with battery energy storage systems. Imitation learning models are used to enhance the reinforcement learning performance for larger test systems.

Skills

Coding Languages Python, Julia, C++, MATLAB
Development Tools SQLite, HPC, TensorFlow, Docker, AWS