

Aryan Ritwajeet Jha

Pursuing Doctor of Philosophy in Electrical and Computer Engineering

PERSONAL DETAILS

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EDUCATION

Doctor of Philosophy
Electrical and Computing Engineering
Washington State University
Pullman, WA
Currently 4.00/4.00 GPA

Aug '22 -

Graduate Work
Electrical Engineering
Indian Institute of Technology Delhi

Sep '20 - Aug '22

Bachelor of Engineering.
Electrical and Electronics Engineering
with a Minor in Data Science
Birla Institute of Technology and Science Pilani
Hyderabad Campus
Secured 8.47/10.00 CGPA

Aug '16 - May '20

12th
Bansal Public School
Kota, Rajasthan
Central Board of Secondary Education
Secured 90.00% marks

May '16

10th
St. Theresa's Convent Sr. Sec. School
Karnal, Haryana
Central Board of Secondary Education
Secured 10.00/10.00 CGPA

May '14

INTERNSHIPS

Summer Internship

May - Jul '18

Power Grid Corporation of India Limited, Gurgaon, Haryana

Title : Monitoring Power Systems: SCADA vs WAMS

Supervisor : Dr. R. K. Mittal, Professor, Department of Mechanical Engineering, BITS Pilani, Pilani Campus

PROJECTS

Ongoing Doctoral Thesis

Aug '22 -

Multi-Period Optimal Power Flow in Distribution Systems

Supervisor : Dr. Anamika Dubey, Associate Professor, School of Electrical Engineering and Computer Sciences, Washington State University

My thesis problem statement is devising an Optimal Multi-time Period Powerflow Strategy for a radial power distribution system equipped with renewables and storage elements. The algorithm facilitating the same will allow for decomposing the computation burden of computing a minimizer of an objective function (say, line losses) both spatially and temporally. The modelling and algorithm development is part of the “Connected Communities” project sponsored by the Department of Energy, and involves the partnership of Washington State University, Avista Utilities, Edo Energy and Pacific Northwest National Lab.

Research Project

Sep '20 - Aug '22

Data Analysis for Predicting Instabilities in Power Systems

Supervisor : Dr. Nilanjan Senroy, Professor, Department of Electrical Engineering, IIT Delhi

An accumulation of stochastic disturbances in the power grid causes various steady state instabilities to develop, which can lead to blackout without any early warning indicators. My task was to statistically analyze the bus voltage magnitudes of the power grid for symptoms of *Critical Slowing Down*, detected via statistical parameters such as autocorrelation and variance in order to develop a reliable early warning service which may be used to avoid blackouts or at least mitigate its effects. Dynamic simulations were done in Siemens PSS®E 34.3 coupled with Python 2.7 being used for automation. Data Analysis was done in MATLAB.

Bachelor's Thesis

Jan - May '20

Coordination Schemes for Load Frequency Control of Distributed Energy Resources

Supervisor: Dr. Aivelu Manga Parimi, Associate Professor, Department of Electrical and Electronics Engineering, BITS Pilani, Hyderabad Campus

In order to achieve a more robust control of the grid frequency in a power grid consisting of varied energy resources including photo-voltaics and diesel engine generators, inclusion of storage elements such as large scale batteries and flywheels was proposed. A dynamic state simulation in MATLAB Simulink confirmed the effectiveness of the strategy. Further, an upper limit to the number of such incorporable storage elements, breaching which would otherwise cause the grid to blow up, was also found.

Project Type Course

Aug - Dec '19

Generalized Transfer Function Based Algorithm to Localize Partial Discharge in a Transformer

Supervisor: Dr. Mithun Mondal, Assistant Professor, Department of Electrical and Electronics Engineering, BITS Pilani, Hyderabad Campus

Due to large amounts of current and voltage transacted via power transformers, locations within the inner dielectrics or oils sometimes tend to ionize and develop a partial discharge, which can cause equipment damage in the long term. Utilizing the RLC ladder network of a transformer to form a MIMO transfer function, an algorithm was designed in MATLAB

which, given the current measurements at the live and neutral terminals, would output the location of the single partial discharge affecting the transformer.

Course Project

Jan - May '19

Simulation and Design of Fast Charging Infrastructure for a University-Based e-Carsharing System

Supervisor: Dr. Sudha Radhika, Assistant Professor, Department of Electrical and Electronics Engineering, BITS Pilani, Hyderabad Campus

Based on the IEEE Transactions on Intelligent Transportation Systems paper of the same name, implemented an intelligent battery charging station in MATLAB Simulink which during the day would check the state of charge of incoming e-vehicles and charge as per the distance to the destination location. During night time, the station batteries would get recharged through the grid power via AC to DC converters.

TEACHING EXPERIENCE

TA for Power Engineering I course

Jan - May '22

IIT Delhi

(taken by Undergraduate 3rd year students)

Assigned evaluation of minor (mid-semester) answer scripts.

TA for Power Systems Laboratory course

Aug - Dec '21

IIT Delhi

(taken by Undergraduate 4th year students)

Moderated a doubt session. Made one question paper set for the minor (mid-semester) exam and later graded corresponding responses.

TA for Mathematics III: Differential Equations

Aug - Dec '18

BITS Pilani Hyderabad Campus

(taken by Undergraduate 2nd year students)

Checked mid-semester answer scripts and made slides for a tutorial session.

COURSES

Courses in Power Systems



- Power System Analysis
- Power System Protection
- Power System Dynamics
- Power System Operation and Control

Courses in Data Science



- Applied Statistical Methods
- Machine Learning
- Information Retrieval
- Fundamentals of Data Science
- Convex and Nonlinear Optimization
- Neural Networks and Fuzzy Logic

Other Courses in Electrical Engineering



- Random Processes
- Power Electronics

Electrical Machines
 Electromagnetic Theory
 Control Systems
 Signals and Systems
 Digital Signal Processing
 Digital Electronics
 Microprocessors and Interfacing
 Analog Electronics
 Digital Image Processing

CERTIFIED ONLINE COURSES

Wind Energy

Denmark Technological University on Coursera [↗](#)



Battery State of Charge Estimation

UC Colorado System on Coursera [↗](#)



Introduction to Battery Management Systems

UC Colorado System on Coursera [↗](#)



Plasma Physics: Introduction

EPFL on edX [↗](#)



Introduction to Power Electronics

University of Colorado Boulder on Coursera [↗](#)



SKILLS

Languages

Maithili (mother tongue)
 English
 Hindi

Programming Languages

C/C++, PYTHON, MATLAB, JULIA

Typesetting and Drawing

L^AT_EX, INKSCAPE

Software

MATLAB SIMULINK, SIEMENS PSS[®]E, MAPLE, OPENDSS

STANDARDIZED TESTS

GRE General Test: 333/340 AWA: 4.5/6.0

TOEFL iBT: 113/120 (including 26/30 in speaking section)

GATE EE 2020 rank 588 out of 90k+ candidates.

OTHER INTERESTS

1. Listening to podcasts related to Energy including The Energy Transition Show with Chris Nelder and MIT Energy Initiative by MITeI
2. Competitive Programming (in C++)