Rahul Ranjan Jha

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EDUCATION

- Ph.D. in

Power Engineering — Aug 2016 – Current

- Cumulative GPA: 3.7 / 4.0
- Thesis: Optimization and Control of the Distribution system
- Adviser: Dr. Anamika Dubey

- M.Tech in

Power and Control — Jul 2013 – Jul 2015

- Thesis: Development of Control Strategies for Power Management with Renewable Resources
- Cumulative GPA: 8.8/10.0
- Adviser: Prof. S.C.Srivastava

- B.Tech in

Electrical and Electronics Engineering — Jul 2008 – May 2012

- Cumulative GPA: 81.8/100.0

RESEARCH EXPERIENCE

Research Assistant,

- Washington State University — Aug 2016 –Current

Project: Advance Distributed Management System

- Supervisors: Prof. Anjan Bose and Dr Anamika Dubey
- The project is in collaboration with Pacific Northwest National Laboratory. The focus of the project is to develop Volt-VAR optimization application on GridAPPS-D.
- The three phase unbalanced power flow is proposed which is used for the optimization of the distribution system. The modelling of the capacitor banks, voltage regulators and load (linear CVR effect) in the distribution system. Conservation voltage reduction using capacitor banks, voltage regulators and smart inverter.
- Reducing the voltage variability cause due to photvoltaic installation at a bus using smart inverter. The control signal are provided to smart inverter by interfacing of Matlab and OpenDSS.
- Proposed a sequential linear programming and iterative convex programming to reduce the computation time required to solve the optimal power flow problem in a three-phase unbalanced distribution system.

- Indian Institute of Technology, Kanpur — Jul 2013 – Jul 2015

Thesis: Development of Control Strategies for Power Management with Renewable Resources

- Adviser: Prof. S.C.Srivastava
- Integration of Photovoltaic ,Wind Turbines and Battery Energy Storage System to the grid using PID, Fuzzy logic and ANFIS control.
- Modeling a cluster of house with Photovoltaic and Battery Energy Storage System and management of power flow under various load condition.

Course Projects,

- Indian Institute of Technology, Kanpur
  - HVDC Application for Enhancing Power System Stability
    - Studied about Voltage Source Converter HVDC which damp out the rotor angle oscillation of the generator. Simulation is done to verify the effect of VSC HVDC in stabilizing the rotor angle of the weak system.
  - Static ATC Determination Using Radial Basis Function Neural Network
    - Studied about the need of Available Transfer Capability (ATC) in the power market. The simulation is done to determine ATC using ANN on IEEE 14 bus system.
  - Dynamic Simulation and Stability Control of Distribution System with Distributed Generators
    - Modelling of the IEEE 13 node distribution system and diesel engine on Simulink. The oscillation in the system is reduced by using Thyristor Control Breaking Resistor and resistor in parallel with capacitor.

PUBLICATIONS

JOURNALS

[1] Rahul R Jha; Anamika Dubey and Kevin P. Schneider, ”Coordinated Control for Voltage Regulation of Unbalanced Power Distribution System:Centralized and Local Control Methods,” in IET Generation, Transmission Distribution (II revision).

[2] Rahul R Jha and Anamika Dubey , ”Sequential Linear Programming for Volt-VAR Optimization to Coordinate Smart Inverters with Voltage Control Devices ,” (in preparation).

[3] Rahul R Jha and Anamika Dubey , ”Iterative Convex Programming for Volt-VAR Optimization in a three-phase unbalanced distribution system,” (in preparation).

[4] Rahul R. Jha; Anamika Dubey; Chen-Ching Liu; Kevin P. Schneider, “Bi-level Volt-VAR Optimization to Coordinate Smart Inverters with Voltage Control Devices”, in IEEE Transaction on Power System.

[5] Rahul R Jha; S. C. Srivastava and M. Kumar, ”Development of Control Schemes for a Cluster of PV-Integrated Houses in Islanded mode,” in IET Renewable Power Generation, vol. 11, no. 7, pp. 903-911, 6 7 2017.

CONFERENCES

[1] Rahul R Jha and Anamika Dubey,“Coordinated Voltage Control for Conservation Voltage Reduction in Power Distribution Systems”, in IEEE Power and Energy Society General Meeting (PESGM) 2020.

[2] Mohammad Ostadijafari;Rahul R Jha and Anamika Dubey,“Aggregation and Bidding of Residential Demand Response into Wholesale Market”, in Texas Power and Energy Conference, 2020.

[3] Rahul R Jha; Anamika Dubey;Tianqi Hong and Dongbo Zhao,“Distributed Algorithm for Volt-VAr Optimization in Unbalanced Distribution System”, in Innovative Smart Grid Technologies, 2020.

[4] Rahul R Jha and Anamika Dubey,“Local Smart Inverter Control to Mitigate the Effects of Photovoltaic (PV) Generation Variability”, in North American Power Symposium (NAPS) 2019.

[5] Mohammad Ostadijafari;Rahul R Jha and Anamika Dubey,“Conservation Voltage Reduction by Coordinating Legacy Devices, Smart Inverters and Battery”, in North American Power Symposium (NAPS) 2019.

[6] Rahul R Jha and Anamika Dubey,“Exact Distribution Optimal Power Flow (D-OPF) Model using Convex Iteration Technique”, in IEEE Power and Energy Society General Meeting (PESGM) 2019.

[7] Rahul R Jha and S. C. Srivastava,“Fuzzy Logic and ANFIS Controller for Grid Integration of Solar Photovoltaic”, IEEE International Conference on Power Systems, 2016.

[8] Rahul R Jha and Gaurav Pandey, “Internal Model Bases Current Control for Grid Integrated Solar Photovoltaic”, IEEE International Conference on Power Systems, 2017.

INTERNSHIP

Argonne National Laboratory, May 2019 – Aug 2019
Identification of active motor load parameters in the WECC system. Cost and efficiency assessment tool in AC and DC distribution grids

National Renewable Energy Laboratory, May 2018 – Aug 2018
The performance of the Xcel feeders are evaluated by installing ENGO devices at the secondary of the distribution transformer. The power flow analysis is performed by interfacing REopt and OpenDSS using python.

GE India Technoogy Centre Pvt. Ltd., May 2014 – Jul 2014
Worked on deriving the sensor less control techniques for Sine fed Switched Reluctance Motor. The simulation is performed on Matlab/Simulink to verify the sensor and sensor less control techniques.

AWARDS & SCHOLARSHIPS

- University Grants Commission, Scholarship
  Awarded for the academic excellence during junior and senior year of undergraduate.
- POSOCO Power System Awards, 2016
  Awarded for Masters research excellence in power system.

OTHER WORK EXPERIENCE

Teaching Assistance, Indian Institute of Technology, Kanpur

- Teaching Assistant for the EE 330 course (Power Systems) during August-November 2014.
- Teaching Assistant and Lab instructor for the ESO 203 course (Basics of Electrical Engineering) during December 2014-April 2015.
- Research Assistant, worked on developing DC microgrid on RTDS/RSCAD platform.

SKILLS

Computer Programming
MATLAB, Python, C
Power System Simulation
MATLAB, OpenDSS, PSCAD, RSCAD, PSS/E, PowerWorld

PROFESSIONAL AFFILIATIONS

IEEE Power and Energy, Student Member