Rishabh Jain

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Education

- ✓ **Doctoral Candidate, Ph.D. (Electrical Engineering)**   **August 2014 to Present**
  North Carolina State University, US
    - ➢ **Research Assistant for Dr. Srdjan Lukic at FREEDM Center**
        - o Distributed Energy Storage Device Project – Real time heath estimation tool
        - o Diagnostics and Prognostics Using Temporal Causal Models for Cyber Physical Systems- A case of Smart Electric Grid
    - ➢ *G.P.A (as of now):* 4.17 (on a scale of 4)
- ✓ **Master's Degree, M.S. (Electrical Engineering) - GPA: 4.00 (on a scale of 4.00)**   **2014**
  University of Idaho, US
- ✓ **Bachelor's Degree, B.Tech. (Electrical Engineering)**   **2011**
  Indian Institute of Technology (IIT), Dhanbad
    - ➢ *O.G.P.A. :* 7.92*   ***On Absolute Scale:** (OGPA or GPA) x 10 gives the Percentage of marks obtained.*
    - ➢ *Highest Marks in Electrical Measurements, Control Systems, Utilization of Electrical Power & Digital Signal processing*
- ✓ **AISSE, Matriculation**   **2004**
  D. A. V. Co-Operative Sr. Sec. Public School, Khalari
    - **Marks Obtained** : 91.67%
    - 2nd Topper of School with 94% in Science, 97% in Maths, 96% in I.T.

Publications and Papers in progress

- ✓ **A Data-Driven Method to Characterize Turbulence-Caused Uncertainty in Wind Power Generation** – Zhang J., Jain R., Hodge B. M., Journal of Applied Energy
- ✓ **Energy Storage System Sizing for Islanded Microgrids Considering Battery Degradation** – Du, Y., Jain R., Lukic, S. M., ECCE 2016
- ✓ **Investigating the Impact of Wind Turbines on Distribution System Stability** – Jain R., Zhang Y. C., Hodge B. M., ISGT 2016
- ✓ Jain, R.; Lukic, S. M.;, **An Improved Distance Relay Model with Directional Element, and Memory Polarization for TCD Based Fault Propagation**, *North American Power Symposium 2015*.
- ✓ Jain, R.; Johnson, B.; Hess, H.;, **Performance of Line Protection and Supervisory Elements for Doubly Fed Wind Turbines**, *IEEE PES General Meeting, 2015*.
- ✓ Jain, R.; Hess, H.; Johnson, B.;, **DFIG based Wind turbine system modeling in the Real Time Digital Simulator**, *North American Power Symposium 2014*.
- ✓ **Generator Protection Overcomes Current Transformer Limitations** – Donolo, M., Guzmàn A., Mynam, M. V., Jain R., Finney, D., Schweitzer Engineering Laboratories, Inc. – WPRC 2014
- ✓ R. Jain, **Grid Integrated Type 3 Wind Systems - Modeling, and Line Protection Performance Analysis using the RTDS**, Thesis, University of Idaho, Moscow, 2014.
- ✓ **Tutorial on the Impact of Network parameters on Distance Element Resistance Coverage** – Benmouyal G., Guzmàn A., Jain R., Schweitzer Engineering Laboratories, Inc. – Western Protective Relay Conference (WPRC) 2013
- ✓ Jain, R.; Hess, H.; , **Automated Cycler Unit for Large Scale Vehicles (LSV 2)**, *Power Electronics (IICPE), 2010 India International Conference on Power Electronics* , vol., no., pp.1-7, 28-30 Jan. 2011

Research (most notable 10 mentioned)

1. Distributed microgrid protection, islanding and reconfiguration algorithms for RIAPS (Resilient Information Architecture Platform for Smart Grid) – (ARPA-E) – *In Progress*
2. Lifetime assessment of Li-Ion cells, & (near) real time degradation assessment (NSF ERC) – *In Progress*
3. Diagnostics and Prognostics Using Temporal Causal Models for Cyber Physical Systems- A case of Smart Electric Grid (NSF CPS) – *In Progress*
4. Investigating the Impact of Wind Turbines on Distribution System Stability

5. Characterizing Turbulence-Caused Uncertainty in Wind Power Generation
6. Review: Modeling of Operating Reserves for Renewable Integration Studies
7. Modelling of Magnetizing Inrush current in Power Transformers using RTDS
8. Modelling switching and averaged Type-2 and Type-3 Wind turbines (WT) using RTDS and Analysis of response of Line protection elements
9. Project Green: Powering up a camp near Cascade, ID for Zero emissions – Avg 313KwH/day
10. Utility Load Predictor using Artificial Neural Networks

Fields of Interest

- Micro-grid Operation and stability
- Real time Hardware-in-loop simulations
- Grid Integration - Distributed generators
- Sizing and applications of energy storage in renewable based Micro-grid systems
- Power System Protection and Relaying

Work Experience

1. Intern, Power Systems Operation **June '15 to Aug '15**
   Transmission and Grid Integration Group,
   National Renewable Energy Laboratory, Denver - CO
   Project Mentors: Dr. Bri-Mathias Hodge, Dr. Ying Chen Zhang
   ✓ Finished three projects (1st author on two) in Operational reserves, Dynamic Power system operation, and uncertainty analysis respectively, resulting in three papers submitted for review
2. Research Engineering Intern **May '13 to July '14**
   Power Systems Research Group, Schweitzer Engineering Laboratories, Inc.
   Project Mentors: Mr. Venkat M. Mynam, Mr. Armando Guzman
   ✓ Modeling of Type 2 Wind Turbines and analysis of Line protection elements
   ✓ Co-author in 2 papers from SEL, Multiple protection analysis and development projects
3. Teaching Assistant – ECE 321 **August '12 to May '13**
4. Executive Trainee, National Mineral Development Corporation **July '11 to August '12**
   ✓ **Kirandul, Chattisgarh** : Field Electrical Services–Deposit 11C – *(July 24, 2011 – Dec. 8, 2011)*
      - Highest scorer in Phase Evaluation midst Electrical Engineers, 2nd highest in batch
      - Service Engineer for electric Shovels, drill machines and general mine operations
   ✓ **Bacheli, Chattisgarh** : Crushing Plant – Deposit 10/11A – *(Jan. 09, 2012 – Aug. 14, 2012)*
      - Shift In-charge – Leading shift operations for team of 13
   RFP : "Motor Reversal Indicator", "Solution to Silo Dilemma", "Energy Security for NMDC"

Training

- **Testing and Improvement of the design of On-chip Power Electronic Converters in an Automated Battery Cycler for Large Scale Vehicles (LSV 2)** - University of Idaho*(5/17–7/31,2010)*
  Project Mentors: Dr. Herbert L. Hess and Dr. Brian K. Johnson
- **Operational Analysis of Protection Schemes using Relays for machines operating** at Bhander Power Limited (A Subsidiary of ESSAR Power Limited, Hazira) – *(May 18, 2009 to June 01, 2009)*
- **Study of different methods of Condition Monitoring of Transformers & Motors employed** at Renusagar Power Division (A Division of HINDALCO Industries) – *(Dec 21, 2008 to Dec 31, 2008)*

Skills

- **Real Time Simulator Platforms:** The RTDS, OPAL-RT
- **Tools and Technologies :** Matlab/Simulink, OpenDSS, PSS/E, CAPE, PSCAD, ATP, LabVIEW, MathCAD, LTSpice
- **Programming Languages :** Matlab, Python, Octave, HTML

Achievements

✓ Runner up for Outstanding Graduate Research Assistant Award, 2014
✓ Secured All India Rank : 4370 in **IITJEE 2007** among over 1,60,000 Candidates in India
✓ **1st Prize** :"Electrical Muse" (Papermeet) in SPARX 2010 for **Room Automation Unit**
✓ **1st Prize** : Paper-Meet (Srijan 2K9) for **Rural Electrification in India using Renewable Energy**
✓ **1st Prize** : Manual Robotics (Mechathlon'07, A National Level Tech-Fest of I.S.M., Dhanbad)
✓ **2nd Prize** : Paper-Machie (Paper-meet by Dept. of Environmental Engg.) in Srijan 2K9
✓ **Stood 2nd** in School in 10th Grade (AISSE Examination) in total batch strength of 169 students
✓ N.T.S.E. (National Talent Search Examination) 2000 : 94.96 %ile

Extra-Curricular Activities

o **Treasurer**, Indian Student Association – University of Idaho
o **Workshop Coordinator** and **Creative Head** for SPARX'10 – Annual Techfest at IIT Dhanbad