

# Shiva POUDEL

## Electrical Engineer | Ph.D. Candidate

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Pullman, WA

I am a highly organized and detail-oriented research assistant with over 4 years of experience with expertise in power system simulations and computations as evidenced by more than 10 publications. Worked on multiple projects developing tools and applications to enhance power distribution system resilience. I am a knowledgeable innovator with advanced skills in power system modeling and optimization.

## PROFESSIONAL EXPERIENCE

Present August 2016	<b>Graduate Research Assistant, Washington State University, Pullman, WA</b> <ul style="list-style-type: none"><li>&gt; Develop an optimal, scalable and robust framework to enhance power delivery system resilience.</li><li>&gt; Measure resilience as a function of the response and recovery process in smart and robust distribution network.</li><li>&gt; Develop a fault location, isolation, and service restoration (FLISR) application and integrate with an open-source standards-based platform for ADMS application development viz. GridAPPS-D, developed by Pacific Northwest National Laboratory (PNNL).</li></ul> <p>MATLAB Python OpenDSS GridLAB-D GridPV</p>
August 2019 May 2019	<b>Graduate Research Intern, Electric Power Research Institute, Palo Alto, CA</b> <ul style="list-style-type: none"><li>&gt; Studied the energization optimization for optimal blackstart capability.</li><li>&gt; Proposed an improved network model to generate computationally efficient restoration sequence.</li><li>&gt; Developed a generalized framework for optimal black start incorporating cost and timing.</li></ul> <p>PSSE Python</p>
August 2018 May 2018	<b>Graduate Research Intern, Mitsubishi Electric Research Laboratories, Cambridge, MA</b> <ul style="list-style-type: none"><li>&gt; Developed an efficient and robust approach for outage detection in power distribution system during natural disaster.</li><li>&gt; Proposed an effective restoration scheme for power delivery system during an extreme event utilizing renewables and energy storage system.</li></ul> <p>MATLAB OpenDSS</p>
August 2016 August 2015	<b>Graduate Research Assistant, South Dakota State University, Brookings, SD</b> <ul style="list-style-type: none"><li>&gt; Studied application of unsupervised learning approaches in cascading failures for power grid security.</li><li>&gt; Developed an efficient algorithm for contingency analysis through electrical distance approach.</li><li>&gt; Developed a real-time Cyber-Physical System (CPS) test-bed for security and control experiments.</li></ul> <p>MATLAB PowerWorld</p>
August 2015 August 2014	<b>Graduate Teaching Assistant, South Dakota State University, Brookings, SD</b> <ul style="list-style-type: none"><li>&gt; Taught different power system problems like power flow, series and shunt compensation, contingency analysis through simulation of different benchmarks in PowerWorld Simulator.</li><li>&gt; Designed electronic circuits (various amplifier and oscillator circuits) and lab manual for practical.</li><li>&gt; Assigned group project for students to design a specific electronic circuit.</li></ul> <p>PowerWorld PSPICE</p>
June 2014 December 2013	<b>Junior Assistant (Intern), Winrock International, Kathmandu, Nepal</b> <ul style="list-style-type: none"><li>&gt; Field visit in remote areas of Nepal to find need and potential of renewable energies.</li><li>&gt; Data collection as well as preparing reports for distribution and installation of solar panels, PV water pumping, and improved cooking stove.</li></ul> <p>Microsoft Office</p>

## EDUCATION

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Present August 2016	<b>Ph.D. in Electrical Engineering, WASHINGTON STATE UNIVERSITY, Pullman, WA</b> <ul style="list-style-type: none"><li>&gt; Research : Enhancing and Quantifying Power Distribution System Resilience</li><li>&gt; Cumulative GPA : 3.81 on a 4.00 scale</li><li>&gt; Relevant Coursework : Power System Analysis, Power Electronics, Electromagnetics, Power System Stability and Control, Power System Protection, Power System Operation and Control, Power Quality</li></ul>
August 2016 August 2014	<b>M.S in Electrical Engineering, SOUTH DAKOTA STATE UNIVERSITY, Brookings, SD</b> <ul style="list-style-type: none"><li>&gt; Research : Cascading Failures and Contingency Analysis for Smart Grid Security.</li><li>&gt; Cumulative GPA : 3.96 on a 4.00 scale</li><li>&gt; Relevant Coursework : Advanced Power System, Advanced Power Electronics, Power System Dynamics, Photovoltaic Engineering, Model/Control of Power Electronics System, Computational Intelligence</li></ul>
January 2014 December 2009	<b>B.E. in Electrical Engineering, INSTITUTE OF ENGINEERING, CENTRAL CAMPUS, Kathmandu, Nepal</b> <ul style="list-style-type: none"><li>&gt; Senior Design Project : Speed control of Slip Ring Induction motor using IGBT</li><li>&gt; Cumulative GPA : 3.95 on a 4.00 scale</li><li>&gt; Relevant Coursework : Basic Electrical, Electronic Circuits, Digital Logic, C, C++, Microprocessor, Electric Machines, Signal Analysis, Digital Signal Processing, Control System, Power System Analysis</li></ul>

## SKILLS

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Programming language	Python, C/C++, $\text{\LaTeX}$
Simulation Applications	MATLAB, PSSE, PowerWorld, MATPOWER, PSCAD, OpenDSS, GridLAB-D
Operating Systems	Windows, Linux
Microsoft Skills	Word, Excel, Powerpoint, Visio

## HONORS AND AWARDS

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2019 Awardee,	Harold and Dianna Frank Electrical Engineering Fellowship Fund from Washington State University
2018 Awardee,	Harold and Dianna Frank Electrical Engineering Fellowship Fund from Washington State University
2018 Second Place,	Best paper award at 51 <sup>st</sup> North American Power Symposium (NAPS)
2017 Awardee,	Travel grant to attend National Science Foundation (NSF) Workshop at Texas A&M University
2017 Awardee,	Travel grant from Power and Energy Society to attend US-CA IEEE PES Student Congress
2013 Awardee,	Tribhuvan University merit scholarship for exceptional performance in academia
2010 Awardee,	Batch topper shield by Free Students Union (FSU), Institute of Engineering, Pulchowk Campus, Nepal

## TALKS/PRESENTATIONS

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<i>Paper Presentation</i>	October 2019
<b>North American Power Symposium</b>	Wichita, KS
A Non-Exhaustive Search Algorithm to Identify Distribution Grid Operational Topology	
<i>Poster Presentation</i>	August 2019
<b>IEEE Power and Energy Society General Meeting</b>	Atlanta, GA
Probabilistic Quantification of Power Distribution System Resilience	
<i>Paper Presentation</i>	September 2018
<b>North American Power Symposium</b>	Fargo, ND
Optimal Positioning of Mobile Emergency Resources for Resilient Restoration	
<i>Paper Presentation</i>	July 2017
<b>IEEE Power and Energy Society General Meeting</b>	Chicago, IL
A Robust Approach to Restoring Critical Loads in a Resilient Power Distribution System	

## PROFESSIONAL SERVICE AND ACTIVITIES

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### Professional Society Membership




- 2014 - Present Student Member, IEEE
- 2014 - Present Student Member, IEEE Power and Energy Society (PES)

### Peer Review Service

- Reviewer IEEE Transactions on Smart Grid
- Reviewer IEEE Transactions on Power Systems
- Reviewer IEEE Systems Journal
- Reviewer IEEE Power and Energy Society General Meeting (PESGM)

## OPEN SOURCE SOFTWARE

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- D-Net, D-OPF**
  - > A library for modeling power distribution network and solving application such as optimal power flow, restoration, and volt-var control.
  -  <https://github.com/shpoudel/D-Net>
  -  <https://github.com/shpoudel/D-OPF> (early stage)
- WSU-Restoration**
  - > A Fault Location, Isolation, and Service Restoration (FLISR) application and its integration to an open-source standards-based platform (GridAPPS-D), developed by Pacific Northwest National Laboratory.
  -  <https://github.com/shpoudel/WSU-Restoration>

## PUBLICATIONS

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### BOOK CHAPTER

- [B1] S. Poudel and B. Bhattarai “**Resilient Planning and Control of Future Power Grid,**” *Intelligent Power Grid of Tomorrow : Modeling, Planning, Control, and Operation. (In press)*

### PATENT APPLICATIONS

- [P2] H. Sun and S. Poudel, “**Post-Disaster Topology Detection and Energy Flow Recovery in Power Distribution Network.**” *Assignee: Mitsubishi Electric Research Laboratories, Inc. (Cambridge, MA, US)*
- [P1] H. Sun and S. Poudel, “**Methods and Systems for Post-Disaster Resilient Restoration of Power Distribution System.**” *Assignee: Mitsubishi Electric Research Laboratories, Inc. (Cambridge, MA, US)*

### JOURNALS

- [J8] S. Poudel, A. Dubey, P. Sharma, and Kevin P. Schneider, “**A Standalone FLISR Application Using GridAPPS-D – Standards-Based Open-Source ADMS Platform,**” *In Prep. for IEEE Access*
- [J7] S. Poudel, A. Dubey, and Kevin P. Schneider, “**A Two-Stage Framework for Service Restoration in a Resilient Power Distribution Systems,**” *In Prep. for IEEE Transactions on Power Systems*
- [J6] S. Poudel, A. Dubey, and Kevin P. Schneider, “**A Generalized Framework for Service Restoration in a Resilient Power Distribution System,**” *Submitted to IEEE Systems Journal.*
- [J5] S. Poudel, A. Dubey, and A. Bose, “**Risk-based Probabilistic Quantification of Power Distribution System Operational Resilience,**” *IEEE Systems Journal. doi : 10.1109/JSYST.2019.2940939, Sept. 2019*
- [J4] A. Gandluru, S. Poudel, and A. Dubey “**Joint Estimation of Operational Topology and Outages for Unbalanced Power Distribution Systems,**” *IEEE Transactions on Power Systems, Aug. 2019*
- [J3] S. Poudel and A. Dubey, “**Critical Load Restoration Using Distributed Energy Resources for Resilient Power Distribution System,**” *IEEE Transactions on Power Systems, vol. 34, no. 1, pp. 52-63, Jan. 2019.*
- [J2] S. Poudel, Z. Ni, and W. Sun, “**Electrical distance approach for searching vulnerable branches during contingencies,**” *IEEE Transactions on Smart Grid, vol. 9, no. 4, pp. 3373-3382, July 2018.*
- [J1] S. Poudel, Z. Ni, and N. Malla, “**Real-time cyber physical system testbed for power system security and control,**” *Int. J. Electr. Power Energy Syst., vol. 90, pp. 124-133, Sep. 2017*

## CONFERENCES

- [C14] S. Poudel, A. Dubey, P. Sharma, and K. P. Schneider “Advanced FLISR Application Using GridAPPS-D – Standards-Based Open-Source ADMS Platform,” *Submitted to 2020 IEEE Power & Energy Society General Meeting, Montreal, Canada.*
- [C13] S. Poudel, H. Sun, D. Nikovski, and J. Zhang “Distributed Average Consensus Algorithm for Damage Assessment of Power Distribution system,” *2020 IEEE PES Innovative Smart Grid Technologies Conference (ISGT), Washington, DC, 2020, pp. 1-5.*
- [C12] M. Mukherjee, S. Poudel, A. Dubey, and A. Bose “A Framework to Quantify the Value of Operational Resilience for Electric Power Distribution Systems,” *2020 IEEE Power & Energy Society T & D Conference, Chicago, IL, 2020, pp. 1-5.*
- [C11] M. Mukherjee, S. Poudel, A. Dubey, and A. Bose, “Risk-driven Planning for System Upgrades to Enhance Resilience of Distribution Systems,” *2020 Texas Power and Energy Conference, College Station, TX, 2020, pp. 1-5.*
- [C10] S. Poudel, A. Dubey, and A. Bose “Probabilistic Quantification of Power Distribution System Resilience,” *2019 IEEE Power & Energy Society General Meeting, Atlanta, GA, 2019, pp. 1-5.*
- [C9] S. Poudel, H. Sun, D. Nikovski, and J. Zhang “Resilient Restoration of Power Distribution System Based on Minimum Spanning Forest,” *2019 IEEE Power & Energy Society General Meeting, Atlanta, GA, 2019, pp. 1-5.*
- [C8] A. Gandluru, S. Poudel, and A. Dubey, “A Non-Exhaustive Search Algorithm to Identify Distribution Grid Operational Topology,” *2019 North American Power Symposium (NAPS), pp. 1–6, IEEE, 2019*
- [C7] S. Poudel and A. Dubey, “A Graph-theoretic Framework for Electric Power Distribution System Service Restoration,” *2018 IEEE Power & Energy Society General Meeting, Portland, OR, 2018, pp. 1-5.*
- [C6] S. Poudel, M. Mukherjee, and A. Dubey, “Optimal Positioning of Mobile Emergency Resources for Resilient Restoration,” in *2018 North American Power Symposium (NAPS), pp. 1–6, IEEE, 2018*
- [C5] M. Mukherjee, S. Poudel, A. Dubey, and A. Bose, “Distributed Generator Sizing for Joint Optimization of Resilience and Voltage Regulation,” in *2018 North American Power Symposium (NAPS), pp. 1–6, IEEE, 2018*
- [C4] A. Dubey and S. Poudel, “A Robust Approach to Restoring Critical Loads in a Resilient Power Distribution System,” *2017 IEEE Power & Energy Society General Meeting, Chicago, IL, 2017, pp. 1-5.*
- [C3] N. Malla, S. Poudel, N. Gyawali, N. R. Karki, “Resilience of Electric Power Delivery System in Response to Natural Disaster,” *2017 7th International Conference on Power Systems (ICPS), Pune, 2017, pp. 806-811.*
- [C2] S. Poudel, Zhen Ni, T. M. Hansen and R. Tonkoski, “Cascading failures and transient stability experiment analysis in power grid security,” *2016 IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT), Minneapolis, MN, 2016, pp. 1-5.*
- [C1] S. Poudel, Z. Ni, X. Zhong and H. He, “Comparative studies of power grid security with network connectivity and power flow information using unsupervised learning,” *2016 International Joint Conference on Neural Networks, Vancouver, BC, 2016.*

## REFERENCES

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