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Bikrant Poudel, Ph.D.

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Professional Profile

Dr. Poudel has a background in power systems, renewable resources integration, transmission protection, and electric machine design/optimization. He has expertise in electromagnetic transient simulation of power systems and has extensive experience with power systems simulation tools such as EMTP, PSCAD, OPAL-RT, Mathworks, Doble protection suite, and acSELerator QuickSet.

Dr. Poudel has experience with IEEE 2800 and UL 1741 standards to model grid forming and grid following inverter-based resources for transient simulation of power systems. Dr. Poudel also has expertise in machine design and optimization using finite element analysis tools such as Ansys and dSpace. He is knowledgeable in using python-based machine learning and optimization tools to design, analyze and optimize machines.

Dr. Poudel has worked on several utility-based research projects where he has worked with electromagnetic transient simulation tools such as EMTP, PSCAD, and OPAL-RT to study the interaction of grid-following and grid-forming inverter-based resources on a bulk power system. His work involved contingency analysis of a system with photovoltaic systems, the performance of photovoltaic systems on low inertia systems, and optimization of control parameters of inverter control systems. His work with real-time hardware in the loop simulation involves static VAR compensator interaction and researching fault-induced delayed voltage recovery of bulk power systems. Dr. Poudel has also worked on electromagnetic transient simulation-based modeling of photovoltaic inverter-based systems in compliance with IEEE 2800 and UL 1741 standards. Moreover, Dr. Poudel has also set up a relay testing lab with SEL relays and Doble power system simulator tools and set up a motor drive lab with a dSpace real-time hardware in the loop simulator. Dr. Poudel's expertise in electric machine design includes analytical modeling, deep neural network-based, finite element-based design, and optimization of hybrid permanent magnet machines.

Academic Credentials & Professional Honors

Ph.D., Engineering and Applied Science, University of New Orleans, 2022

M.S.E., Engineering, University of New Orleans, 2017

B.E., Electronics and Communication Engineering, Tribhuvan University, Nepal, 2013

Tau Beta Pi, Engineering Honor Society

Academic Appointments

Instructor, Engineering Software Tools and Circuits Laboratory, Department of Electrical and Computer Engineering, University of New Orleans, 2021-2022

Prior Experience

Graduate Research Assistant, Power Energy and Research Lab, University of New Orleans, 2015-2022

Graduate Teaching Assistant, University of New Orleans, 2015-2022

Professional Affiliations

Institute of Electrical and Electronics Engineers

Languages

Nepali

Publications

Poudel B. Machine Learning Based Design Methodology for Electric Machines, Ph.D. Dissertation, University of New Orleans, 2022.

Poudel B, Amiri E, Rastgoufard P. Analytical Investigation and Heuristic Optimization of Surface Mounted Permanent Magnet Machines with Hybrid Magnetic Structure. IEEE Open Journal of Industry Applications 2022; 3: 152-163.

Basnet M, Poudel B, Amiri E, Rastgoufard P. Optimization Framework to Determine Optimal Location and Sizing of Photovoltaic Energy Sources in Electric Grids. 2022 IEEE Kansas Power and Energy Conference (KPEC); 1-6.

Poudel B, Amiri E, Xiros N, Rastgoufard P. Design Optimization of Dual-Pole Permanent Magnet Machine. 2022 IEEE Kansas Power and Energy Conference (KPEC); 1-4.

Poudel B, Amiri E. An Optimization Framework for Minimizing Cogging Torque in Surface Mounted Permanent Magnet Machines. 2022 IEEE 31st International Symposium on Industrial Electronics (ISIE); 492-498.

Rimal B.P, Kong C, Poudel B, Wang Y, Shahi, P. Smart Electric Vehicle Charging in the Era of Internet of Vehicles, Emerging Trends, and Open Issues. Energies 2022; 15:1908.

Poudel B, Amiri E, Rastgoufard P, Mirafzal B. Toward Less Rare-Earth Permanent Magnet in Electric Machines: A Review. IEEE Transactions on Magnetics 2021; 57:1-19.

Poudel B, Bhandari B, Amiri E, Rastgoufard P, Field T. E, McCanne R. A. Interconnection Study and Optimization of Grid Connected Photovoltaic System Using Electromagnetic Transient Program. 2021 IEEE Kansas Power and Energy Conference (KPEC); 1-6.

Poudel B, Amiri E, Ramamurthy J. R, Leevongwat I, Field T. E, Rastgoufard R, Rastgoufard P. Hardware-in-the-Loop Testing of Dynamic Grid Voltages for Static Var Compensator Controllers with Single-Phase Induction Motor Loads. IEEE Open Access Journal of Power and Energy 2020; 7: 307-319.

Poudel B, Shiwakoti R, Amiri E, Rastgoufard P, Field T. E, Ramamurthy J.R. Aggregate Model of Single Phase Induction Motors. 2019 IEEE International Electric Machines & Drives Conference (IEMDC); 1373-

1378.

Shiwakoti R, Poudel B, Amiri E, Divandari M, Damaki A. Design and analysis of modular axial flux switched reluctance motor. 2019 IEEE International Electric Machines & Drives Conference; 1521-1525.

Poudel B, Amiri E, Charalampidis D. Design improvement of dual pole synchronous reluctance motor. 2018 IEEE Energy Conversion Congress and Exposition (ECCE); 5403-5407.

Amiri E, Poudel B, Aliabad A. D, Ghoroghchian F, Dobzhanskyi O. The emergence of dual pole line start synchronous motors. 2018 IEEE Energy Conversion Congress and Exposition (ECCE); 1656-1660.

Poudel B, Amiri E, Rastgoufard P. Design and analysis of line start synchronous reluctance motor with dual saliency. 2018 IEEE Transportation Electrification Conference and Expo (ITEC); 385-388.

Poudel B, Amiri E, Aliabad A. D, Ghoroghchian F. Line start synchronous motor for multi-speed applications. 2017 IEEE International Electric Machines and Drives Conference (IEMDC); 1-6.

Ghoroghchian F, Aliabad A. D, Amiri E, Poudel B. Line start permanent magnet synchronous motor with dual magnetic polarity. 2017 IEEE International Electric Machines and Drives Conference (IEMDC); 1-6.

Poudel B. Line Start Permanent Magnet Synchronous Motor for Multi Speed Application. Master's Thesis, University of New Orleans, 2017.

Poudel B, Amiri E, Rastgoufard P. Surface-climbing Planar Induction Motor. 2016 IEEE 25th International Symposium on Industrial Electronics (ISIE); 216-220.

Published Abstracts and Presentations

2022 8th International Conference on Sustainable Energy and Environment (SEE)

2022 IEEE Kansas Power and Energy Conference (KPEC)

2022 IEEE 31st International Symposium on Industrial Electronics (ISIE)

2021 IEEE Kansas Power and Energy Conference (KPEC)

2019 Innovate UNO: University of New Orleans research symposium

2019 Distributech Conference

2019 IEEE International Electric Machines & Drives Conference (IEMDC)

2019 IEEE International Electric Machines & Drives Conference (IEMDC)

2018 IEEE Energy Conversion Congress and Exposition (ECCE)

2018 IEEE Energy Conversion Congress and Exposition (ECCE)

2018 IEEE Transportation Electrification Conference and Expo (ITEC)

2017 IEEE International Electric Machines and Drives Conference (IEMDC)

2016 IEEE 25th International Symposium on Industrial Electronics (ISIE)

Peer Reviews

IET Electric Power Applications

IEEE Access

IEEE Power and Energy Technology Systems Journal

IEEE Open Access Journal of Power and Energy

MDPI World Electric Vehicle Journal

MDPI Energies Journal