Muyang Li

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TECHNICAL PROFICIENCY HIGHLIGHTS

- Highly-skilled electrical engineer with four years industry experience with power systems and renewable energies, including two years project experience in the design and construction of a 300MW wind power plant.
- Familiar with popular motor control schemes (V/Hz, FOC, DTC), motor drives, power electronics, and PWM techniques (THIPWM, SVPWM).
- Proficient with control of permanent magnet synchronous motors (maximum torque per ampere control and flux-weakening control), DC converters (buck, boost, buck/boost, and flyback), AC inverters (VSI and Z-source inverters), semiconductor switches (IGBT, MOSFET) and motor modeling (induction motors and PM motors).
- Solid hands-on skills with data acquisition of motors, motor testing, circuit design, assembly and testing of DC-DC converters/AC inverters, and DC bus design.
- Versed in professional tools including ANSYS Simplorer, ANSYS Maxwell, MATLAB/Simulink, PLECS, NI LabVIEW, PSpice, PowerWorld, PSCAD and AutoCAD.
- Experience with general programming languages, including C and MATLAB, and strongly interested in embedded control (DSP, MCU, etc.) and software programming.

EDUCATION

December 2014 — **Marquette University**, Milwaukee, WI
Master of Science in Electrical Engineering **GPA: 3.8/4**
Major: Electrical Machines and Drives, Power Electronics
Master Thesis: Flux-Weakening Control of Permanent-Magnet Synchronous Motors Based on Z-Source Inverters
Advisor: Prof. Nabeel A.O. Demerdash, Life Fellow, IEEE

2003-2007 — **Shandong University**, Jinan, Shandong, China
Bachelor of Science in Electrical Engineering **GPA: 80/100**
Major: Power System and Power Electronics

ACADEMIC EXPERIENCE

September 2011-present — **Master student, Research/Teaching Assistant at Marquette Electric Machines and Drives Lab**

- Research assistant on the project titled "Modeling and Design Optimization of High-Efficiency Permanent Magnet Machine-Drive Systems", sponsored by Mid-West Energy Research Consortium (M-WERC), May 2014-present. **Personal contribution**: Simulated preliminary analytical models in ANSYS Maxwell and MATLAB for calculating AC copper losses of motor windings due to skin and proximity effects.
- Research assistant on the project titled "Advanced Design Optimization and Simulation of Modular Brushless Permanent Magnet Electric Machines and Drives", sponsored by Regal-Beloit Manufacturing Corporation, August

2013-May 2014. **Personal contribution**: Simulated and analyzed a 12-slot 10-pole 10 hp interior permanent magnet synchronous motor in ANSYS Maxwell with different speed and load.

- Research assistant on the project titled "A Nationwide Consortium of Universities to Revitalize Electric Power Engineering Education by State-of-the-Art Laboratories", sponsored by Department of Energy, September 2012-August 2013. **Personal contribution**: Assembled and tested DC/DC converters including buck converter, boost converter, buck/boost converter, and flyback converter. Collected data through NI LabVIEW.
- Teaching assistant in Electrical and Computer Engineering Department, **09/2013-05/2014**.
- Power electronics experience:
  - Simulation of multi-pulse rectifiers, PWM inverters, three-phase four-leg fault tolerant inverters, Z-source inverters, different PWM methods.
  - DC bus (including pre-charge circuit) and AC choke design for a 20 kW three-level NPC inverter which was assembled in 2013-2014 for an NSF-GOALI project (No. 1028348).
- Motor control experience:
  - Motor-drive system with mechanical load simulated with an optimal control strategy: MTPA control at low speeds and closed-loop flux-weakening control at high speeds. Familiar with V/f control, FOC, and DTC.
  - Developed and simulated a new flux-weakening algorithm by employing the voltage boost capability of Z-source inverters.

INDUSTRIAL EXPERIENCE

Renewable Energy Engineer — **"Wind Power Development plan for 12th-five-year" Project**
Shenzhen Energy Group Co., Ltd. China. — **Aug. 2010-Jul. 2011**

- Served as a renewable energy engineer for the cooperation projects with the Inner Mongolia Branch of the China State Grid Corporation (former China Electric Department). Worked with senior engineers on government plans for wind power development regulation. Responsible for wind power database development and analysis.

Electrical Engineer — **"Yi He" 300MW Wind Power Plant Project**
Shenzhen Energy Group Co., Ltd. China. — **Jan. 2009-Jul. 2010**

- Supervised electrical engineering design and testing activities for a 300MW wind power plant. Responsible for designing substation apparatus. Tested and assembled 35kV and 220kV equipment, reviewed blue prints, developed technical documents, and compiled wind plant operating procedure.

Assistant Electrical Engineer — **Wind Power Plant Assessment Project**
Shenzhen Energy Group Co., Ltd. China. — **Jul. 2007-Jan. 2009**

- Acted as a team leader and provided technical support in a wind measurement project in Inner Mongolia, China. Took charge of assembling and testing eleven anemometer towers in this project.

PUBLICATION

M. Li, J. He, and N.A.O. Demerdash, "A flux-weakening control approach for interior permanent magnet synchronous motors based on Z-source inverters," *IEEE Transportation Electrification Conference and Expo (ITEC)*, pp. 1-6, Jun. 2014.

P. Zhang, G.Y. Sizov, **M. Li**, D.M. Ionel, N.A.O. Demerdash, S. Stretz, and A.W. Yeadon, "Multi-objective tradeoffs in the design optimization of a brushless permanent magnet machine with fractional-slot concentrated windings," *IEEE Trans. Ind. Appl.*, vol. 50, no. 5, pp. 3285-3294, Sept./Oct. 2014.