WaiYan(Anson) Chan

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Education

University of Wisconsin-Madison — **Madison, WI**

Ph.D. in Electrical and Computer Engineering — Present
M.S. in Electrical and Computer Engineering — June 2024
B.S. in Mechanical Engineering — December 2021

Relevant Coursework

- Dynamics and Control of AC Drives
- EM Design of AC Machines
- Redesign and Prototype Fabrication
- Power Electronic Circuits and Lab
- Automatic Controls Lab
- Finite Elements

Research Experience

Precision Mechatronics and Control Lab - WEMPEC — **Aug. 2024 – Present**

Graduate Research Assistant, Ph.D. — *Madison, WI*

Severson Research Group - WEMPEC — **Aug. 2022 – Jun. 2024**

Graduate Research Assistant, M.S. — *Madison, WI*

- **Additively Manufactured (AM) Stator Housing for High-Speed Bearingless Generator**
  - Developed and fabricated AM housing with integrated cooling channels for a 100kW, 80kRPM high-speed twin bearingless generator in a microturbine-based CHP generation system.
- **Bearingless Machines (BSPM) for Aerial E-Turbocharger Application**
  - Conducted structural and modal analysis to validate rotor design by identifying critical speed and rotor stress.
  - Modeled and conducted FE analysis of an 8kW 4-DOF twin-stator BSPM, along with component fabrication.
  - Facilitated the development of multi-physics modeling framework for BSPM and created Python scripts for evaluating machine constants and coil inductances in JMAG.

Wisconsin Electric Machinery and Power Electronics Consortium — **Sep. 2019 – Dec. 2021**

Undergraduate Researcher — *Madison, WI*

- Prototyped a desktop size dynamometer setup capable of characterizing electric machines rated up to 10 N-m of torque and 3000 RPM. Reduced the original setup volume by 35%.
- Collaborated with a team of graduate researchers to prototype a modular terminal box for powering a 200 kW NASA prototype machine. Responsible for sourcing parts and creating CAD models.
- Fabricated BSPM machines by producing stator slot windings and machining components used in the assembly.

Industry Experience

Milwaukee Tool — **Jan. – Aug. 2022**

NPD Mechanical Design Engineer — *Brookfield, WI*

- Conducted FE analysis on BLDC machines of various sizes and winding configurations, recommended optimal designs for product development using Pugh Matrix for informed and cost-effective solutions.
- Assessed power tool performance requirements through the collection and analysis of motor thermal characteristics and power output data from competitor products.

Projects & Skills

eMach | *Open-Source Python Machine Modeling and Optimization Framework* — **2022 - Present**

Compact Low Voltage Induction Machine with 3D Printed Housing | *ME Senior Design* — **2021**

UW CoE Undegraduate Learning Center | *Tutor, Physics and Engineering Statics* — **2018-19**

Wisconsin Racing Electric | *Chassis Team Member* — **2018-21**

Hands-on: Electric Machine Fabrication, Component Machining and Assembly, CAD Design and Drafting, GD&T
Tools: Python, Git, SolidWorks, NX, ANSYS, MATLAB / Simulink, Altium, LabView, MAGNET, FEMM, JMAG, LaTeX

Publications

1. T. Noguchi, N. Petersen, **W. Chan**, L. Rapp, E. Severson, "Bearingless Motor/Generator Applications in sCO_2 Power Cycles," *The 8th Internationl Supercritical CO_2 Power Cycles Symposium, San Antonio, TX, USA, 2024 (Accepted)*
2. T. S. Slininger, **W. Chan**, E. L. Severson, and B. Jawdat, "An Overview on Passive Magnetic Bearings," *2021 IEEE International Electric Machines & Drives Conference (IEMDC), Hartford, CT, USA, 2021*