

Education

University of Wisconsin-Madison	Madison, WI
M.S - Electrical and Computer Engineering, GPA: 3.93/4	June 2024
B.S - Mechanical Engineering, GPA: 3.72/4	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

Severson Research Group - WEMPEC	August 2022 – June 2024
Graduate Research Assistant	Madison, WI
<ul style="list-style-type: none">• Additively Manufactured Stator Housing for High-Speed Bearingless Generator<ul style="list-style-type: none">◦ Develop and fabricate additively manufactured 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<ul style="list-style-type: none">◦ Perform ANSYS structural and modal analysis to validate high-speed rotor design. Identify critical speed and rotor stress under rated operating condition.◦ Facilitate the development of a multi-physics modeling framework for evaluating and optimizing BSPM electric machines. Create Python scripts necessary to evaluate machine constants and coil inductances in JMAG.◦ Perform characterization of a 4-DOF 8kW twin stators BSPM machine. Fabricate components for test fixturing.	

Work Experience

Milwaukee Tool	January – August 2022
NPD Mechanical Design Engineer	Brookfield, WI
<ul style="list-style-type: none">• Conducted FEA analysis on BLDC motors of different 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.	
Wisconsin Electric Machinery and Power Electronics Consortium	September 2019 – December 2021
Undergraduate Researcher	Madison, WI
<ul style="list-style-type: none">• 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.	

Projects

eMach <i>Open-Source Python Machine Modeling and Optimization Framework</i>	2022 - Present
Compact Low Voltage Induction Machine with 3D Printed Housing <i>ME Senior Design</i>	2021
UW CoE Undergraduate Learning Center <i>Tutor, Physics and Engineering Statics</i>	2018-19
Wisconsin Racing Electric <i>Chassis Team Member</i>	2018-21

Publications

1.

T. Noguchi, N. Petersen, **W. Chan**, L. Rapp, E. Severson, “Bearingless Motor/Generator Applications in sCO₂ Power Cycles,” *The 8th International Supercritical CO₂ 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*

Technical Skills

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, L ^A T _E X