

YINAN (JERRY) QIN

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EDUCATION

Northwestern University

B.S. in Mechanical Engineering (Expected June 2025)

M.S. in Mechanical and Materials Engineering (Expected June 2025)

Evanston, IL

B.S. GPA: 3.98/4.00

M.S. GPA: 4.00/4.00

PROFESSIONAL EXPERIENCE

Tesla Motors

Thermal Engineering Intern, Tesla Heat Pump

Fremont, CA

September 2024 – December 2024

- Characterized compressor suction superheat and refrigerant charge effect on performance and developed heat exchanger ΔP and HTC python model, improving prediction accuracy by 40% at 8 operating conditions
- Developed component level design of experiments optimization code and designed new heat exchanger geometries with predicted 5% and 40% HTC and refrigerant charge improvement with only 1 kPa ΔP penalty
- Designed refrigerant sensor testbench in CATIA, programmed Raspberry Pi to convert sensor i2c or UART signal to CAN, and informed sensor placement in car based on its tested 5 second lower limit response time

Space Exploration Technologies (SpaceX)

Mechanical Engineering Intern, Thrust Vectoring Mechanism

Hawthorne, CA

June 2024 – August 2024

- Designed and analyzed planetary roller screw joint for axial, shear, torsional, and vibrational loading and compared 3 design options in 50+ Ansys FEA simulations, resulting in a minimum safety factor of 1.27
- Designed harmonic drive gearbox subassembly for actuator position sensing after trading 3 bearing configurations and reduced manufacturing complexity and cost by 15% compared to previous design
- Created fault tolerant circuit for actuator motor and built and tested unit with 8 custom hardware parts

Milwaukee Electric Tool Company (Milwaukee Tool)

Thermal Engineering Intern, Battery and Charger Cooling

Milwaukee, WI

June 2023 – August 2023

- Determined airflow and pressure rise needed for specified end-of-charge temperature in developing 6-bay charger using Ansys Fluent CFD, and cut simulation time and mesh size by 40% with porous model batteries
- Designed 7 axial and 1 mixed flow fan blades using Vista and theoretical models and conducted design of experiments (DOE) optimization of impeller aspect ratio, trim ratio, and DeHaller Numbers for max efficiency
- 3D printed optimized impeller which improved efficiency and temperature by 5% and 2°C over current iteration

PROJECTS AND RESEARCH

Northwestern University Solar Car Team

Chief Mechanical Engineer, Aerothermal Lead

Evanston, IL

September 2021 - Present

- Leading a team of 20+ mechanical engineers in designing and manufacturing the chassis, suspension, aerodynamic, ergonomics, and electrical integration systems of the next Solar powered race car
- Optimized aeroshell geometry over 24 iterations by improving local stagnation flow and flow separation points in Ansys Fluent CFD and reduced drag coefficient by 30% and drag force by 25N at max cruising speed
- Designed and optimized air duct within battery box to increase the steady state discharge temperature by 8 °C
- Optimized chassis with FEA over 15 iterations to reduce weight by 15 lbs and maintain safety factor of 1.4

Northwestern Computational Nanodynamics Research Lab

Materials Researcher, Northwestern Undergraduate Grant Competition Winner

Evanston, IL

January 2022-Present

- Used LAMMPS molecular dynamics simulator to equilibrate and test 100+ polymer-grafted nanoparticle (PGN) systems to optimize material properties, such as tensile strength and toughness, for different applications
- Wrote 20+ python and bash scripts to analyze PGN glass transition behavior and crystal structure evolution
- Tuned coarse-grained force field parameters for Graphene Oxide composites in impact resistance research

SKILLS, COURSES, AND ACTIVITIES

Skills: FEA (Ansys Structural, Solidworks/NX FEA), CFD (Ansys Fluent, CFX), CAD (CATIA V5, NX, SolidWorks), Ansys thermal suite, Comm (i2c, CAN, SPI, UART), Python, Matlab, C/C++, English, Mandarin

Relevant Courses: Fluid Mechanics, Heat Transfer, Thermodynamics, Solid Mechanics, Statics/Dynamics

Activities: NU Philharmonia Orchestra, NU Badminton Club Team, Chess Club (Past President), NU ASME