Zhishan Wang

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Education

Purdue University West Lafayette, IN, USA

Bachelor of Science in Electrical Engineering (Minor: Mathematics), GPA: 4.0/4.0 *Sep 2023 – May 2026 (Expected)*

- Major Concentration: Automatic Control
- Coursework: Signals and Systems, Probabilistic Methods, Electromagnetics, Semiconductor Devices, Electrical Engineering Fundamentals, Python for Data Science, Advanced C Programming, Linear Algebra, Multivariate Calculus, Ordinary Differential Equations, Fundations of Analysis
- Achievements: Dean's List & Semester Honors (College of Engineering & Polytechnic Institute)

Dalian Maritime University Dalian, China

Transferred Credits: 57.5 credit hours *Sep 2021 – Jun 2023*

- Coursework: Advanced Mathematics, Complex Function/Integral Transformation, Automatic Control Theory, Probability Theory/Math Statistics, Basics of Computer Programming
- Achievements: Merit Scholarship (2022)

Research Experience

Controller Design for Autonomous Racing Vehicle Aug 2025 – Present

Team Leader & System Designer, Senior Design Project, Purdue University *West Lafayette, IN*

- Leading a senior design team in developing advanced control systems for autonomous racing vehicles under the supervision of Prof. Samuel Labi
- Analyzed vehicle physical dynamics and constructed closed-loop control system models incorporating track conditions, external disturbances, sensor errors, and controller inputs using MATLAB
- Developed comprehensive simulation and testing framework in MATLAB for controller performance evaluation
- Designed and tuned PID controllers as baseline control solution, analyzing limitations in real-world racing scenarios
- Implemented Active Disturbance Rejection Control (ADRC) method to address disturbance rejection requirements in racing conditions
- Achieved control objectives of speed optimization, stability maintenance, and energy efficiency through ADRC implementation
- Successfully validated controller performance meeting requirements for rapid response, system stability, and controlled energy consumption

Real-time Feedback System Design for Energy Systems Feb 2024 – Present

Undergraduate Researcher, Purdue University *West Lafayette, IN*

- Studied and analyzed U.S. energy network systems to understand decision-making and operational processes
- Applied deep learning methods to model energy system regulation under the guidance of Prof. Junjie Qin
- Designed real-time compensation and control measures for energy redistribution considering various factors including weather patterns and user preferences
- Analyzed system performance at different time intervals, verifying effectiveness through marginal benefit and output capacity relationship analysis
- Mastered MATLAB/Simulink for modeling and simulation, and utilized CVX module for system optimization

Lunar Lander Design Nov 2024 – Dec 2024

Undergraduate Researcher, Purdue University *West Lafayette, IN*

- Designed a practical lunar lander computer system on FPGA using hardware description languages
- Developed combinational and sequential logic circuits using hardware components and SystemVerilog
- Built a spacecraft navigation control system addressing speed, altitude, and fuel consumption optimization
- Constructed basic physical models and integrated control algorithms for multi-dimensional control systems
- Utilized SystemVerilog for hardware design and FPGA implementation, gaining proficiency in digital circuit design
- Conducted system testing and validation through mathematical modeling and team-based data measurement

Optical Heart Rate Sensor Design and Implementation Mar 2025 – May 2025

Undergraduate Researcher, Purdue University *West Lafayette, IN*

- Successfully designed and implemented a photoplethysmography (PPG) based optical heart rate sensor
- Achieved accurate heart rate measurement capability in 40-200 BPM range with digital signal output and LED indicator functionality
- Developed comprehensive sensor system including infrared optical sensor, signal processing circuits, high-pass and low-pass filters
- Designed and implemented drive circuits for IR204 + PT204-6B LED selection, parameter calculation and optimization
- Created digital signal processing circuits and collection systems through software-defined signal amplitude limiting
- Achieved anti-interference design for DC signal elimination and noise interference suppression
- Optimized system performance to achieve accurate measurement within 40-200 BPM range with precision below 100
- Gained hands-on experience in analog and digital circuit design, signal processing, and biomedical sensor implementation

Design of Low-Frequency Vibration Kinetic Energy Acquisition System Mar 2022 – Jul 2022

Researcher, Dalian Maritime University *Dalian, China*

- Analyzed and modeled the mechanical structure of an energy harvesting system using COMSOL and SolidWorks
- Conducted strength and feasibility analysis for mechanical structures and contributed to the design of the mechanical arm
- Led the selection and testing of piezoelectric materials for vibration energy harvesting
- Designed a feedback system to control system stability and response speed based on electrical output
- Performed frequency analysis to determine ideal operating frequency and maximum working gain

Projects

Calorie-Based Fitness Application Nov 2023 – Dec 2023

Tech120: Design Thinking and Application, Purdue University *Best Final Project Award*

- Designed and developed a fitness application tailored to students' needs based on their geographic location and physical conditions
- Created a calorie consumption mathematical model with personalized parameters for different users
- Developed an algorithm to break down long-term fitness goals into daily targets by calculating daily calorie deficits
- Collaborated with life science and sports science students to ensure accurate physiological modeling
- Successfully tested and received positive feedback at university gyms and athletic facilities

Competition Case, Nebulai AI Company Oct 2024 – Nov 2024

- Participated in a campus competition requiring engineering and business students to collaborate
- Developed comprehensive company structure planning, user persona selection, and technical development roadmap for an AI startup
- Gained understanding of AI full-stack solution processes and broader business concepts
- Approached technology development from a macro perspective beyond pure engineering considerations

Professional Experience

School of Electrical and Computer Engineering, Purdue University West Lafayette, IN

ECE Undergraduate Tutor *Aug 2025 – Present*

- Provide comprehensive academic support to undergraduate students across core ECE curriculum courses
- Tutor students in Signals and Systems, Probability Theory, Circuit Analysis, Digital Circuit Design, and Electromagnetic Field Theory
- Assist students with conceptual understanding, exam and interview preparation, and homework guidance
- Contribute to undergraduate teaching curriculum improvement by providing feedback to faculty on course effectiveness and student challenges
- Serve as a key supplementary resource bridging gaps between formal instruction and student comprehension

Purdue University, Engineering Education Department West Lafayette, IN

Teaching Assistant, ENGR131: Transform Ideas to Reality *Aug 2024 – Dec 2024*

- Assisted undergraduate engineering students with Excel and Python data analysis techniques
- Taught microcontroller (Ti Kit) programming, debugging, and basic hardware structure comprehension

- Guided students through practical projects applying statistical measurement and data processing to real-world problems
- Evaluated project feasibility and technical implementations during student group work
- Provided personalized assistance and debugging support for student programming challenges

Midea Group Guangzhou, China
Backend Development Intern, ToB System *Dec 2024 – Jan 2025*

- Learned Spring Boot architecture development processes for B2B systems in the building technology division
- Studied product development workflow and customer interaction procedures
- Gained understanding of departmental code architecture and system requirements

Dalian Maritime University Mathematical Society Dalian, China
Director of Teaching Research *May 2022 – May 2023*

- Designed supplementary mathematics courses addressing undergraduate pain points in collaboration with mathematics professors
- Organized extracurricular lectures enhancing students' mathematical knowledge beyond curriculum requirements
- Created detailed solution guides for mathematics exercises to improve student comprehension
- Led team members in coordinating mathematics competitions and promotional activities

Skills

Programming Languages: C/C++, Python, MATLAB, System Verilog
Tools & Software: SolidWorks, COMSOL, Simulink, CVX Optimization

Awards & Achievements

Purdue University: Eli Shay Electrical Engineering Scholarship (2025)
Purdue University: Dean's List & Semester Honors - College of Engineering (2024)
Purdue University: Dean's List & Semester Honors - Polytechnic Institute (2023)
Course Award in Purdue University: Best Final Project - Tech120: Design Thinking and Application (2023)
Dalian Maritime University: Merit Scholarship (2022)