

# ZIJUN CUI

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## EDUCATION

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### University of Washington

Seattle, WA

Master of Science, Electrical Engineering

Sep. 2024 – Jun. 2026

### Zhejiang University

Hangzhou, China

Bachelor of Science, Electrical Engineering and Automation

Sep. 2020 – Jun. 2024

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## PUBLICATIONS

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“PC-Planner: Physics-Constrained Self-Supervised Learning for Robust Neural Motion Planning with Shape-Aware Distance Function” (under revision) [Publication Details](#)

H. Wang, Y. Li, **Z. Cui**, and Q. Lu, “Influence of Split Teeth on the Performance of Linear Permanent Magnet Vernier Motor,” 2023 14th International Symposium on Linear Drivers for Industry Applications.

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## ACADEMIC EXPERIENCE

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### Research Assistant | State Key Laboratory of CAD&CG

Apr. 2024 – Sep. 2024

Supervised by Prof. [Zhaopeng Cui](#), College of Computer Science and Technology, Zhejiang University

**Project Title:** PC-Planner: Physics-Constrained Self-Supervised Learning for Robust Neural Motion Planning with Shape-Aware Distance Function

- Contributed to the development of a novel physics-constrained planner that learns the time fields and execute motion planning for robots of various shapes from any start state to any goal state in a self-supervised manner.
- Implemented several physical constraints to overcome local minima and converge on solutions.
- Introduced a neural shape-aware distance field for collision checking and adaptive planning, enhancing both self-supervised training and planning phases.
- Achieved higher success rate (SR) and challenging success rate (CSR) metrics compared to current Neural Time Field methods in robotic motion planning across complex 3D environments (Arona and Eastville), and 40 times to as much as 200 times faster than traditional methods.

### Research Assistant | Micro and Special Motor Research Institute

Apr. 2023 – Apr. 2024

Supervised by Prof. Yanxin Li and Prof. Qinfen Lu, College of Electrical Engineering, Zhejiang University

**Project Title:** Influence of Split Teeth on the Performance of Linear Permanent Magnet Vernier LPM (Vernier LPMM)

- Conducted finite element analyses to evaluate the electromagnetic performance of Vernier LPMMs with varying split tooth structures, providing insights into their influence on efficiency, thrust, and power factor.
- Improved force ripple and power factor in Vernier LPMMs by experimenting with different split-tooth structures, contributing to refined performance metrics and enhanced motor design.

### Project Leader | College of Computer Science and Technology

Supervised by Prof. Zhaopeng Cui, College of Computer Science and Technology, Zhejiang University

**Project Title:** Unity3D VR Game Design — “Infinite Liberty”

Apr. 2024 – Jun. 2024

- Utilized Unity3D to develop VR game environments, focusing on interactivity, complex scene construction, and narrative-driven puzzle gameplay.
- Implemented VR interaction systems including animation triggers, user interface (UI) design, and collider triggers to boost interactivity and immersion, and ensured smooth VR hardware integration.

### Undergraduate Researcher | College of Electrical Engineering

Aug. 2023 – Oct. 2023

Supervised by Prof. Jianqi Qiu, College of Electrical Engineering, Zhejiang University

**Project Title:** Drive System Design and Drive Optimization for Brushless DC Motors (BLDCM)

- Engineered comprehensive drive systems for BLDCMs, including the design of a half-bridge power transistor driver, PWM circuitry, and integration of three-phase Hall sensors for enhanced motor control.
  - Implemented a digital control system on a CPLD development board using VHDL, optimizing various starting, driving, and speed control strategies to improve motor performance and efficiency.
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## SKILLS

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**Programming Languages:** Python, C, Java, MATLAB, C++

**Software:** Unity, Quartus II, PSpice, OrCAD, JMAG, ANSYS Maxwell

**Language Proficiency:** TOEFL 104, with Reading 29, Listening 27, Speaking 25, and Writing 23