

Guantian Zheng

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EDUCATION

Huazhong University of Science and Technology

Wuhan 2022.09-2026.06

Bachelor's Degree: School of Integrated Circuits - Integrated Circuit Design

GPA: 87.9/100

Core Courses: Calculus (91), Linear Algebra (91), Probability Theory, Mathematical Equations and Special Functions (94), Circuit Theory (96), University Physics, Signals and Systems (94), Analog Circuits (90), Digital Circuits, Microcontroller Principles, Semiconductor Physics, CMOS Analog Integrated Circuit Fundamentals, Microelectronic Technology

PROJECTS

Institute for AI Industry Research, Tsinghua University

Beijing 2024.06-2024.11

- Joined a summer research program at Tsinghua's Artificial Intelligent Industry Research Institute with approval from both universities.

Project 1 : Delving into Mapping Uncertainty for Mapless Trajectory Prediction

Team Leader

- Reproduced complex map reconstruction models like MapTR, MapTRv2, and StreamMapNet
- Reproduced trajectory prediction models like HiVT and DenseTNT, and integrated them with the reconstructed maps for base and uncertainty-enhanced trajectory predictions
- Added a voting mechanism to HiVT, using ADE, FDE, and MR metrics with temperature SoftMax weighting
- Combined the previous innovations to significantly improve overall prediction metrics, making a substantial contribution to online trajectory prediction and navigation planning

Status: Submitted for consideration at IROS 2025.

Project 2 : Enhanced Point Cloud Reconstruction with PTv3 and HyperCD in SVDFormer

Team Member

- Reproduced SVDFormer for point cloud reconstruction on PCN, 55, and 34 datasets, aligning key metrics (DC, DCD, F1) with the paper.
- Introduced Hyper CD to replace the original CD in the loss function, using hyperbolic space with position-aware embedding to correct Euclidean matching errors
- Replaced the 3D backbone in SVDFormer with PTv3, using z-order and Hilbert curves for sequential features, significantly boosting processing speed and expanding the receptive field

Project 3 : Chameleon: Fast-slow Neuro-symbolic Lane Topology Extraction

Team Member

- Developed the Chameleon algorithm, combining a fast system for direct reasoning over detected instances with a slow system utilizing chain-of-thought design in visual language models to handle corner cases, enhancing lane topology extraction capabilities.
- Evaluated the method on the OpenLane-v2 dataset, demonstrating consistent performance improvements over baseline detectors.
- Provided an economical solution that reduces computational costs and carbon footprint, advancing applications in Mapless Autonomous Driving.

Status: Accepted by ICRA 2025 (Oral Presentation).

National College Student Innovation Program - Brain-Controlled Mechanical Arm

Wuhan 2024.02-2024.05

Team Leader

- The brain-controlled mechanical arm project, led by researcher Dawei Ye, is an innovative initiative aimed at achieving precise control of a mechanical arm using EEG signals
- Responsible for designing the EEG cap, extracting precise EEG signals, and improving algorithms to enhance the accuracy and response speed of signal extraction and analysis
- In charge of front-end signal processing and served as the project leader, overseeing the debugging and configuration of the mechanical arm, while coordinating the integration of both front-end and back-end systems to achieve the final outcome
- Recruited volunteers, collected sample data, and tested the accuracy of the brain-controlled mechanical arm's movements

CAMPUS EXPERIENCES

2022.09

School of Integrated Circuits Debate Team

Team Member / Champion of Debate Tournament

- Actively participated in weekly debate team meetings, frequently responsible for writing debate scripts, and represented the team in mock debates and official competitions
- Performed outstandingly in the HUST Freshman Cup Debate Tournament, where the team stood out from 32 participating teams and won the championship as an engineering team

2022.10

Public Project Laboratory Project Department

member

- In 2023, served as the project manager for innovation projects in the School of Optoelectronics, assisting Professor Tianping Deng in organizing project proposals and progress tracking, and participated in organizing project defenses
- After the Optoelectronics College was split in 2024, appointed by Professor Zheng Lixin as one of the managers for innovation projects in the School of Integrated Circuits, overseeing project progress and organizing project defenses

AWARDS

2023.04: Academic Excellence Scholarship

2023.10: Resilience Scholarship

2024.02: Second Prize in the National College Mathematics Competition

2023.05: "H" Award in the MCM

2023.02: Third Prize in the AMPCM

SKILLS

Language: IELTS: Overall 7.0 (Listening: 7.5, Reading: 7.5, Writing: 7.0, Speaking: 6.0)

Computer: C, Python, MATLAB, SPSS, Verilog, Keil