Chenjie Liu

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Introduction

I'm a third-year master student at Nanjing University (NJU), advised by Prof. Zhongfeng Wang. My current research focuses on hardware design and AI, including Approximate Nearest Neighbor Search and Computer Vision. I plan to pursue a Ph.D. after completing my Master's degree in June, 2025.

Education

Nanjing University (GPA=87.0/100)
M.S. in Electronic Engineering, advised by Prof. Zhongfeng Wang (IEEE Fellow), 2022-2025.

Harbin Institute of Technology (GPA=84.816/100)
B.S. in Opto-Electronic Information Science and Engineering, 2018-2022.

Publications

An Efficient FPGA Implementation of Approximate Nearest Neighbor Search, under second-round review.
Yifeng Song*, **Chenjie Liu***, Rongrong Zhang, Danyang Zhu, Zhongfeng Wang. (* **Equal contribution**)
IEEE Transactions on Very Large Scale Integration Systems (**IEEE TVLSI)**

- Implemented an efficient IVF-PQ hardware design for Approximate Nearest Neighbor Search on FPGA.
- Proposed a novel classification-based multi-data input top-k module, capable of simultaneously inserting several entries into the sorted list with flexible bandwidth.
- Developed a quantification method and a balanced resource allocation scheme to improve parallelism and energy consumption, which achieves significant improvements in both speed and hardware resources.

Patent: A Vector Retrieval Device Based on Approximate Nearest Neighbor Search

Projects

A YOLO-based object detection and tracking method of small ship targets
(The 2nd National Information Fusion Competition, 2022, China. Outstanding Prize of the Final.)

- Developed a high-speed YOLO-based object detection method.
- Proposed a targeted optimization for small, blurred targets on the sea surface, with a two-stage classification-detection strategy.

The research and implementation of lightweight object detection methods for embedded systems

- Developed a MobileNet-based object detection method for small vehicle targets in remote sensing images.
- Completed the deployment of the object detection algorithm on NVIDIA Jetson TX2 based on TensorRT, achieving real-time detection of small targets in remote sensing images.

Research on a super-resolution reconstruction algorithm based on multi-frame sequence vehicle images
(Provincial College Students' Innovation Project, 2019-2021. The Second Prize of Heilongjiang Province.)

- Developed a scale-invariant image registration method based on the SURF algorithm.
- Implemented an image reconstruction algorithm based on the maximum a posteriori (MAP) method.

Other Experiences

Teaching Assistant, Electronic Innovation Practice, 2024.
Participated in the founding of PrimeAI Ltd. and held the position of supervisor, 2023-2024.
International exchange student in Far Eastern Federal University (FEFU), 2019.

Awards

Nanjing University Graduate Academic Scholarship, 2022. The First Prize.
Nanjing University Graduate Academic Scholarship, 2023, 2024. The Second Prize.
The People's Scholarship in China, 2021.
The 2nd National Information Fusion Competition, 2022, China. Outstanding Prize of the Final.
Provincial College Students' Innovation Project, 2019-2021. The Second Prize of Heilongjiang Province.
National English Competition for College Students (NECCS), 2019. National Third Prize.

Skills

English Level: IELTS 7.0
Coding: Proficient in Verilog and Python, also with experience in C, MATLAB, etc.