HOU HUAWEI

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I am Hou Huawei, currently pursuing my undergraduate studies at the National University of Defense Technology, majoring in Computer Science and Technology. My primary research interests include **system software** (e.g., operating systems and compilers), **machine learning**, and **artificial intelligence**. My undergraduate thesis focuses on the design and implementation of **distributed systems**, and I'm currently working on CUDA-CPU-compatible compilation techniques and polyhedral optimization techniques. I'm also trying to write a sysy compiler using Rust.

Education Background

2021-09~2024-12	GPA: 3.71/4 · Rank: 7/19 , CET4 639 · CET6 548
2021-09	NUDT · CS Department · **Computer Science and Technology**
2022-09	NUDT · HPCL
2023~2024	NUDT · Department of Intelligent Data Science (DIDS)

Expertise

Programming	C++, Python, Rust
IT Skills	Linux, CMake, PyTorch, LaTex, Typst, MPI
Courses · CS	Digital Logic & Computer Design (90), Computer System (98)
	Operating System(91), Parallel compilation optimizations(89)
Courses · AI	Computation Theory(98), AI (96), ML (91)

Awards

NUDT Scholarship	**First · Second Prize**	2021-09~2024-12
NUDT CS Department	**Outstanding Student**	2022-09
The 7th PLA Military Modeling Contest	**Second Prize**	2023-12
National College Students' Compilation System Design Competition	**Second Prize**	2024-08

Projects

NUDT SysY Compiler **Competitions** 2024-02~2024-09

C++, CMake, LLVM, Compiler Design, Multi-Threads Parallel, RISC-V

Developed a fully functional compiler system for SysY2022 (a C Subset) using C++ as the primary programming language. The project integrates concepts from compiler theory, operating systems, and computer architecture.

- Over **50,000 lines of code**, including **30,000 lines of handwritten code** and **20,000 lines auto-generated using Python** based on custom templates.
- Successfully passed all functional test cases, supporting lexical analysis, syntax analysis, semantic analysis, and target code generation.
- **Compiler Optimization**:
  - Implemented key optimization techniques such as dead code elimination, loop peeling, and loop parallelization.

The Agility of Deep-Learning in Hyperspectral Pixel Classification **Innovation projects** 2022-06~2023-12

Python, Hyperspectral Image Dataset, Deep Learning

Undertook a research project focusing on the optimization of deep learning algorithms for hyperspectral pixel classification, aiming to construct an efficient data processing pipeline on embedded systems.

- Designed and implemented **dimensionality reduction algorithms** and **deep learning classification models** for hyperspectral data .
- Conducted testing and analysis of the hyperspectral data processing pipeline on an embedded platform (**NVIDIA AGX Xavier**).
- Performed a comprehensive comparative analysis of algorithm combinations (dimensionality reduction + classification).

Interpretability of Geometric Features of High-dimensional Data **School Internship** 2023-08~2023-09

Python, Machine Learning, Geometrical Characteristic

Proposed and explored the geometric feature **"Euclidean Distance to Geodesic Distance Ratio"** to address challenges in machine learning data augmentation. Preliminary testing and validation were conducted on the MNIST dataset.

- Observed that **high-curvature** or **high-variation** regions in high-dimensional datasets typically contain richer information, which can significantly enhance model training effectiveness.
- Enhanced data samples exhibited more prominent features during testing on the MNIST handwritten digit dataset.

Leadership and Extracurricular Activities

Served as Vice Squad Leader, Class Representative and so on.	2021-09~2024-12
Principal of the "**Light of the YH**" Cultural Festival	2022-07
Principal of the "**Open Source for Schools**" Initiatives	2022-07
Enroll "**Tianhe Cup**" Table Tennis Tournament	2022-09
NUDT "**Strong Army Cup**" Basketball Game	2023-09