Fangyi Liu

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Education

Nankai University(NKU) Tianjin, China
B.Eng.Computer Science with Minor Actuarial Science,GPA3.50/4.0(85.96 / 100) *Sept. 2022 – present*

Hong Kong University of Science and Technology (HKUST) Hong Kong, China
MSC Information technology *Sept. 2026 – 2027(expect)*

Key Courses:Computer Graphics(100), Database System(96), Computer System Design(93), Principle of Information Retrieval System(92), Speech Information Processing technologies(96), Software Engineering(96)
Skills: Python,C,C++,R,Java,Verilog,SPSS
English:IELTS 7.0 (Listening:8.0, Reading:8.0, Writing:6.0, Speaking:6.0), CET6 540, CET4 605

Competition & Awards

National Undergraduate Electronic Design Competition Second Prize Aug.2024
Team Leader *Tianjin,China*
- Combined with professional knowledge of artificial intelligence to complete the core code programming and debugging of the intelligent chess-playing robotic arm. This project won the second prize in the National College Students' Electronic Design Competition.
- Programmed the STM32 single-chip microcomputer using Keil to design embedded artificial intelligence scheduling algorithms, and designed image recognition-related algorithms for the OpenMV vision module.

NTIRE MAI Image Denoising Challenge (CVPR 2025) –4th Place Jan. 2025 - Feb. 2025
Team Leader *ETH Zurich,Switzerland*
- Enhanced LAN denoising model with simulated annealing & Gaussian noise optimization; achieved SNR 42.64 dB, SSIM 0.97

China Collegiate Computing Competition, Second Prize Jan. 2025 - Feb. 2025
Team Leader *China*
- Product owner of an LLM-powered teaching-assistant platform; led prototype, full-stack development, and product roadmap
- Achieved high usability score in national semifinal evaluation; praised for practical educational value and technical completeness.

SOA Student Research Case Study Challenge –Global Top 100 Jan. 2025 - Feb. 2025
Core Team Member *America*
- Performed risk assessment and premium evaluation for dam infrastructure across the United States.
- Utilized interdisciplinary knowledge in actuarial science and computer science to build machine learning models that incorporated dam characteristics and environmental variables for premium prediction.

Publications

Multiple Instance Few-Shot Learning for Pathological Image Classification
Fengyu Tian, Zheng Qin, Changjian Wang, Kele Xu, Shimin Tang, Jiahai Su, Dandan Li and Fangyi Liu *Jun. 2025*
- ICTAI 2025(IEEE 37th International Conference on Tools with Artificial Intelligence)(under review)

MCDNet: Morphological-Conditional Dualview Fusion for 3D Tubular Structure Segmentation
Zhiyan Wang;Changjian Wang; Kele Xu; Zhongshun Tang; Yan Zhuang; Jiani Zou; Fangyi Liu *May. 2025*
- Neural Networks(under review)

Honor

Nankai University Scholarship (Merit-based) 2022-2023
- This scholarship is awarded to well-rounded students with outstanding achievements

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Research Experience

Enhanced Speaker-Embedding System (Resemblyzer) Jun. 2025

Principal Investigator *Tianjin, China*

- Improved Resemblyzer speaker embedding by integrating self-attention modules, applying data augmentation techniques, and optimizing LSTM-based loss functions.
- Conducted cross-lingual evaluation between Chinese and English speakers to assess robustness across multilingual speech datasets.
- Led the full research cycle: problem definition, model enhancement, experimental design, and drafting of a research manuscript under submission.

Photon-Mapping & Smoke Simulation – Project Lead Dec. 2024 - Feb. 2025

Principal Investigator *Tianjin,China*

- Implemented a global illumination renderer using Phong-based photon mapping with KD-Tree acceleration; supported caustics, soft shadows, and environment lighting.
- Developed 2D and 3D fluid solvers for smoke simulation based on Navier-Stokes equations; visualized flow dynamics using semi-Lagrangian advection and vorticity confinement.

RISC-V Based Compiler Development Sept. 2024 – Dec. 2024

Principal Investigator *Tianjin, China*

- Designed and implemented a full-featured compiler for the RISC-V architecture, covering six major compilation stages from lexical analysis to code generation.Generated IR and control-flow graphs; implemented optimizations including dead code elimination, constant folding, and loop-invariant code motion.
- Constructed a back-end code generator targeting RISC-V assembly with register allocation and basic block scheduling; successfully executed compiled output on RISC-V simulator.

Pipelined MIPS CPU with Cache Optimization (FPGA) Sept. 2024 – Dec. 2024

Principal Investigator *Tianjin, China*

- Designed a five-stage pipelined CPU in Verilog HDL with instruction/data cache; implemented IF, ID, EX, MEM, WB pipeline stages.Resolved data and control hazards using forwarding and hazard detection units; optimized instruction throughput and memory latency.
- Successfully deployed on FPGA board and passed full instruction set testbench with correct timing and performance.

ICS 2017 System Implementation Project (NEMU & PA) Mar. 2025 – Jun. 2025

Course Project *Tianjin, China*

- Completed the full set of ICS 2017 labs from Nanjin University; built a simple CPU in the NEMU framework with instruction execution, memory handling, and device emulation.Implemented key system features including interrupt handling, dead loop detection, paging, and ELF program loading in PA.
- Integrated simple OS support and deepened understanding of hardware-software interfaces.

uCore Operating System Kernel Development Oct. 2024 – Jan. 2025

Course Project *Tianjin, China*

- Built core components of the uCore teaching OS, including system calls, interrupt handling, virtual memory, and user/kernel mode switching.Implemented basic process scheduler, memory management subsystem, and prototype file system.
- Successfully ran user-space programs on the kernel, gaining practical experience in x86 OS kernel architecture.

Internship Experience

Sharpa Robotics — Robotics Software Engineer Aug. 2025 – Nov. 2025

C++ Development Engineer Intern *Shanghai,China*

- Responsible for data collection related to ROS2 and Protobuf, and implemented the algorithms and architecture for acquiring the relevant execution data.
- Migrated legacy ROS1 packages to ROS2 , resolving compatibility issues and enhancing system performance

Embedded Development at Phytium Technology Jun. 2024 – Sep. 2024

Embedding System Engineer Intern *Tianjin,China*

- Developed on Feiteng-Pi platform; implemented TCP file-transfer module; gained RTOS & low-level debug experience.

Research Director, Quantitative Finance Association, Nankai University Sep. 2023 – Present

Leader *Tianjin,China*

- Oversaw research agenda & corporate projects; partnered with Nonconvex Tech on big-data factor mining