HUANG, Xinyang

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Education

- **Hong Kong University of Science and Technology** — Hong Kong, China
  Doctor of Philosophy - Computer Science Engineering — *Aug. 2023 - Present*
- **Hong Kong University of Science and Technology** — Hong Kong, China
  Master of Philosophy - Computer Science Engineering; GPA: 3.73/4.0 — *Sept. 2021 - Aug. 2023*
  Courses: *Advanced Algorithms (A-), Computer Network (A-), Machine Learning (A-), Advanced Computer Architecture (A+)*
- **University of Electronic Science and Technology of China** — Chengdu, China
  Bachelor of Science in Network Engineering; GPA: 3.88/4.0 — *Sept. 2017 - June 2021*
  Courses: *Graphic Theory, Stochastic Process, TCP/IP Protocol, Access Network, Signal and System, Digital Circuits, etc.*

Skills Summary

- **Languages**: C/C++, Verilog, Python, MATLAB, JAVA, CUDA, etc.
- **SDK**: DPDK, eBPF/XDP, DOCA, NCCL, RDMA Core, etc.
- **Framework**: PyTorch, FATE, Spark, etc.
- **Tools**: Corundum, Vivado/Vitis, Docker, cocotb, MAAS, Keil, etc.

Publications & Patents

- **Accelerating Privacy-Preserving Machine Learning with GeniBatch**: 1th author, EuroSys'24
- **HAFLO: GPU-Based Acceleration for Federated Logistic Regression**: 3th author, FTL-IJCAI'21
- **Heterogeneous acceleration method, device and system for vertical federated logistic regression learning**: 1st author, Patent ID: CN202110934507.4

Selective Research Experience

- **Building High-Performance Host Datapath with Programmable NIC** — HKUST, Hong Kong
  Researcher, Supervisor: Professor Kai CHEN — *Nov. 2022 - Present*
  - **Tech**: DPDK, eBPF/XDP, Corundum, Vivado/Vitis, cocotb, Verilog.
  - Design a 100Gbps programmable NIC architecture with on-path MIPS cores. Develop corresponding DPDK driver and XDP hook to integrate with popular frameworks (e.g., Memcached, eRPC, etc.).
  - **Experimental results and progress**: Build an FPGA prototype based on Corundum and hXDP. The prototype can offload XDP programs with line rate.
- **Accelerating Privacy-Preserving Machine Learning (PPML) with GeniBatch** — HKUST, Hong Kong
  Researcher, Supervisor: Professor Kai CHEN — *Dec. 2021 - Oct. 2022*
  - **Tech**: Docker, FATE, Spark, HDFS, Python, CUDA.
  - Design a batch compiler called GeniBatch that translates a PPML program with Partical Homomorphic Encryption into an efficient program with batch optimization.
  - **Experimental results and progress**: GeniBatch accelerates end-to-end performance for various cross-silo PPML applications from 1.59x to 22.6x. GeniBatch has been accepted by Eurosys'24 (1st author).
- **HAFLO: GPU-Based Acceleration for Federated Logistic Regression** — HKUST, Hong Kong
  Researcher, Supervisor: Professor Kai CHEN — *Mar. 2021 - Sept. 2021*
  - **Tech**: C/C++, CUDA.
  - Develop GPU acceleration library for Federated Learning, accelerating the ciphertext computation process. I was responsible for implementing GPU-based federated learning algorithms.
  - **Experimental results and progress**: The acceleration achieves a 49.9× speedup for heterogeneous LR and 88.4× for homogeneous LR. HAFLO has been accepted by FTL-IJCAI' 21 (3th author).

Honors and Awards

- Postgraduate Studentship (PGS) award of HKUST - 2021-2022, 2022-2023
- Outstanding Academic Scholarship of UESTC for full 3 academic years - 2017-2018, 2018-2019, 2019-2020
- National Innovation and Entrepreneurship Excellent Project - 2018-2019
- Second prize in "Challenge Cup" Science and Technology Competition (Sichuan Division) - Jul. 2019
- Third prize in "Internet +" Innovation Competition (Sichuan Division) - Oct. 2019
- Second prize in National Electronic Design Competition - Aug. 2019

Teaching Experience

- **Teaching Assistant of C++ Programming** — HKUST, Hong Kong
  Conducted tutorials, designed experiments and answered questions. — *Feb. 2022 - Jun. 2022*