

Xinyu Chen

Assistant professor
at Hong Kong University of Science and Technology (Guangzhou)

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RESEARCH INTERESTS

- Domain-specific hardware accelerator
- Heterogeneous computing with FPGAs/GPUs/NPUs
- System optimization for emerging hardware
- Target applications: LLM, Vit, graph processing/mining/NN, and streaming processing

PROFESSIONAL EXPERIENCE

Hong Kong University of Science & Technology (Guangzhou) Jan 2024 – Now
Assistant Professor at Microelectronics Thrust Guangdong

- Conduct research and teaching

HiSilicon, HUAWEI Sep 2022 – Jan 2024
Principal Engineer Guangdong

- Design the programmable hardware accelerator for big data analytics and database systems, which will be integrated into Huawei's next-generation DPU.
- Participate in the architecture design of network processor (NP).

National University of Singapore June 2022 – Sep 2022
Research Fellow Singapore

- Accelerating data processing with FPGAs

Alibaba Group May 2017 – Jul 2017
Intern of PAI (Platform For AI) Hangzhou

- Analyze the performance of the CNN accelerator on Intel Stratix 10 devices and identify system bottlenecks.

AMD-Xilinx Aug 2015 – Jul 2016
Intern of Xilinx University Program department Shanghai

- Explore hardware-accelerated video processing and real-time processing on Xilinx Zynq FPGAs.

EDUCATION

National University of Singapore | *Ph.D. in Computer Science* 2017/8 - 2022/5

- Supervisor: [Prof. Bingsheng He](#)

Harbin Institute of Technology | *B.E. in Microelectronics* 2012/8 - 2016/6

PUBLICATIONS

- Hongshi Tan, **Xinyu Chen**, Yao Chen, Bingsheng He, and Weng-Fai Wong. "LightRW: FPGA Accelerated Graph Dynamic Random Walks" The ACM Special Interest Group on Management of Data (**SIGMOD**), 2023. ([PDF link](#))

- **Xinyu Chen**, Feng Cheng, Hongshi Tan, Yao Chen, Bingsheng He, and Weng-Fai Wong. " ReGraph: Scaling Graph Processing on HBM-enabled FPGAs with Heterogeneous Pipelines " The International Symposium on Microarchitecture (**MICRO**), 2022. ([PDF link](#))
- **Xinyu Chen**, Feng Cheng, Hongshi Tan, Yao Chen, Bingsheng He, Weng-Fai Wong and Deming Chen. " ThunderGP: Resource-Efficient Graph Processing Framework on FPGAs with HLS "ACM Transactions on Reconfigurable Technology and Systems (**TRETS**), 2022. ([PDF link](#))
- Hongshi Tan, **Xinyu Chen**, Yao Chen, Bingsheng He, Weng-Fai Wong and Deming Chen. " ThundeRING: Generating Multiple Independent Random Number Sequences on FPGAs" The International Conference on Supercomputing (**ICS**), 2021. ([PDF link](#))
- **Xinyu Chen**, Hongshi Tan, Yao Chen, Bingsheng He, Weng-Fai Wong and Deming Chen. " Skew-Oblivious Data Routing for Data-Intensive Applications on FPGAs with HLS" The 58th Design Automation Conference (**DAC**), 2021. ([PDF link](#))
- **Xinyu Chen**, Hongshi Tan, Yao Chen, Bingsheng He, Weng-Fai Wong and Deming Chen. "ThunderGP: HLS-based graph processing framework on FPGAs" The International Symposium on Field-Programmable Gate Arrays (**FPGA**), 2021. ([PDF link](#))
- **Xinyu Chen**, Yao Chen, Ronak Bajaj, Jiong He, Bingsheng He, Weng-Fai Wong and Deming Chen. "Is FPGA useful for hash joins?" The International Conference on Innovative Data Systems Research (**CIDR**), 2020. ([PDF link](#))
- Husong Liu, Shengliang Lu, **Xinyu Chen**, and Bingsheng He. "G 3: When Graph Neural Networks Meet Parallel Graph Processing Systems on GPUs." The International Conference on Very Large Data Bases (**VLDB**), 2020. ([PDF link](#))
- **Xinyu Chen**, Ronak Bajaj, Yao Chen, Jiong He, Bingsheng He, Weng-Fai Wong, and Deming Chen. "On-The-Fly Parallel Data Shuffling for Graph Processing on OpenCL-based FPGAs." The International Conference on Field Programmable Logic and Applications (**FPL**), 2019. ([PDF link](#))
- Cheng Liu, **Xinyu Chen**, Bingsheng He, Xiaofei Liao, Ying Wang, and Lei Zhang. "OBFS: OpenCL Based BFS Optimizations on Software Programmable FPGAs." The International Conference on Field-Programmable Technology (**FPT**), 2019. ([PDF link](#))
- Xuntao Cheng, Bingsheng He, Eric Lo, Wei Wang, Shengliang Lu, and **Xinyu Chen**. "Deploying Hash Tables on Die-Stacked High Bandwidth Memory." The International Conference on Information and Knowledge Management (**CIKM**), 2019. ([PDF link](#))
- Chuang-Yi Gui, Long Zheng, Bingsheng He, Cheng Liu, **Xinyu Chen**, Xiao-Fei Liao, and Hai Jin. "A survey on graph processing accelerators: Challenges and opportunities." Journal of Computer Science and Technology, 2019. ([PDF link](#))

TEACHING EXPERIENCE

- Teaching Assistant of CS4225: Big Data Systems for Data Science (NUS, 2020 Spring)
- Teaching Assistant of CG2271: Real-time Operating System (NUS, 2018 Spring and 2018 Fall)
- Teaching Assistant of CG2271: Real-time Operating System (NUS, 2019 Fall)
- Teaching Assistant of IT1001: Introduction to Computing (NUS, 2019 Fall)

ACADEMIC SERVICES

- Program Committee of IEEE Transactions on Knowledge and Data Engineering (TKDE) poster session
- Reviewer of ACM Transactions on Reconfigurable Technology and Systems (TRETS)
- Program Committee of Distributed and Parallel Databases (DAPD) SI

- Reviewer of IEEE Transactions on Knowledge and Data Engineering (TKDE)
- Reviewer of Information Sciences
- Reviewer of IEEE International Conference on Distributed Computing Systems (ICDCS)
- Reviewer of IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGrid)

HONORS & AWARDS

2023 Outstanding Researcher Awards	issued by AMD-Xilinx
2021 Research Achievement Award	issued by NUS
2020 Adaptive Computing Contest, 3rd Place	issued by AMD-Xilinx
2020 Research Achievement Award	issued by NUS
2017 Research Scholarship	issued by NUS
2016 Honor Graduation of Harbin Institute of Technology	issued by HIT
2013 National Scholarship (Top 2%)	issued by Ministry of Education
2013 National Electronics Design Contest (2nd Prize)	issued by Ministry of Education

INVITED TALKS

- 2023 Seminar at the Hong Kong University of Science and Technology (Guangzhou)
- 2022 China National Computer Congress
- 2021 The Xilinx Adaptive Compute Clusters (XACC) Technique Talk
- 2021 Xilinx University Program Winter Camp invited talk
- 2021 Invited talk at Georgia Tech seminar

SIDE PROJECTS

- Point-Clouds based 3D-Object-Detection on PYNQ-DPU ([project link](#))
- ThunderGP: HLS-based Graph Processing Framework on FPGAs ([project link](#))
- An AI-driven Search-by-Image Engine on KV260 ([project link](#))