



# MINGKAI MIAO

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## EDUCATION

### Hong Kong University of Science and Technology (Guangzhou)

Aug. 2024 – Present

the 2nd year PhD student in Microelectronics Thrust

- Supervised by Prof. Hongce Zhang
- GPA: 4.19/4.3

### University of Illinois at Urbana-Champaign

Jan. 2023 – May. 2024

Master student in Electrical and Computer Engineering

- GPA: 3.91/4.0
- Courses taken: Analog Circuit Design, IoT and Cognitive Computing, Computer Organization and Design, Computer Organization, System-On-Chip Design, Embedded System Verification, Parallel Computer Architecture.

### University of Electronic Science and Technology of China

Sep. 2017 – Sep. 2021

B.Eng. in Electronic and Information Engineering

- Engineering GPA: 3.898/4.0 for 77-credit
- Mathematics GPA: 4.0/4.0 for 18.5-credit
- Ranking top 20% with CGPA 3.72/4.0

## SELECTED PUBLICATION

Conference:

### BDD2Seq: Enabling Scalable Reversible-Circuit Synthesis via Graph-to-Sequence Learning

2026

*Mingkai Miao, Jianheng Tang, Guangyu Hu and Hongce Zhang*

AAAI (Oral)

### FORWORD: Accelerating Formal Datapath Verification via Word-Level Sweeping

2026

*Ziyi Yang, Guangyu Hu, Xiaofeng Zhou, Mingkai Miao, Changyuan Yu, Wei Zhang and Hongce Zhang*

DATE

## PRIMARY PROJECT

### Two On-going Research Projects on AI for Hardware Model Checking

Feb 2025 – Present

Hong Kong University of Science and Technology, Guangzhou

Guangzhou & HK, China

- Submitted and wait for review.

### BDD Variable Reordering Using Graph to Sequence Learning

Sep 2024 – Apr 2025

Hong Kong University of Science and Technology, Guangzhou

Guangzhou, China

- Utilize Graph Encoder with Pointer Network Decoder & Beam Search to explore promising BDDs variable ordering sequences.
- Further applied in BDD-based reversible circuit synthesis and achieve great performance on Quantum Cost saving and computation acceleration.

### FPGA-Optimized Parallelism in Deep Neural Networks

Jan 2024 – May 2024

University of Illinois at Urbana-Champaign

Champaign, US

- Implement the LeNet network for handwriting recognition tasks on the Xilinx Pynq Z2 Board from three aspects: Hardware, Model Architecture, and Software. In terms of Hardware, use High Level Synthesis to design the hardware accelerator. For Model Architecture, optimize using Pruning and Quantization. On the Software side, an Interrupt Handler is designed to achieve Function Level Parallelism (with Dataflow support at the Hardware level). Compared to the CPU platform on Pynq Z2, a final acceleration of **63.7x** is achieved.

- Project Link: <https://github.com/tracymiao111/CS533-FinalProject>

### 5 stage pipelining RISC-V processor design

University of Illinois at Urbana-Champaign

Aug 2023 – Dec 2023

Champaign, US

- Implemented the multicycle 5 stage pipelined RV32I processor
- Implemented one-cycle hit i-cache, L2 unified cache and fully parameterized multi-level d-caches (PLRU replacement policy) with an eviction buffer
- Implemented RISC-V M Extension, simple hardware prefetching
- Achieved the **3rd place (33 groups)** in UIUC Computer Organization and Design RV32I Competition in December
- Project Link: <https://github.com/tracymiao111/Pipelined-CPU-Design>

### Low dropout regulator design

University of Illinois at Urbana-Champaign

Apr 2023 – May 2023

Champaign, US

- Designed a low dropout regulator (LDO) used to generate supply voltage to sensitive analog circuits on Cadence Virtuoso
- Achieved specifications including Input/Output voltage, Load current, DC load/line regulation, etc
- Project Link: <https://github.com/tracymiao111/LDO-Design>

### Bearing fault diagnosis project based on deep learning techniques

University of Electronic Science and Technology of China

Nov 2020 – May 2021

Chengdu, China

- Tested on the fault bearing data set from Case Western Reserve University
- Built ARCRNet (Attentive Residual Convolution Recurrent Network) model to train data and achieved 92%+ accuracy under -6dB noise condition

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## HONORS AND AWARDS

### Winner of University's First-class Merit-based Scholarship

University of Electronic Science and Technology of China

Fall 2018 & 2019

### Postgraduate Studentship Full Scholarship(PGS)

Hong Kong University of Science and Technology

Sep 2024 - Present

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## SERVICE

### Artifact Evaluation Committee

TACAS 2025, TACAS 2026

### Program Committee

AAAI 2026

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## SKILLS

**Languages:** English (IELTS 7.0; GRE 329), Chinese (Native)

**Programming:** SystemVerilog, C++, Python

**Document Creation:** Latex, Markdown