Yongkun WU

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EDUCATION BACKGROUND

Department of Electronic Engineering, Nanjing University **Nanjing, China**
B.S. in VLSI Design and System Integration Sep 2018-Jun 2022

- GPA (overall): **4.59/5.0**; Ranking: **1/201**

Selected Courses:

- The C Programming Language (100/100), Data Structure and Algorithm (98/100), Digital Image Process and Introduction to Computer Vision (95/100), Introduction to Computer System (94/100)

English Scores: TOEFL: **111 (Listening: 29, Speaking: 28, Reading: 28, Writing: 26)** GRE: **327 (Analytical Writing: 4)**

RESEARCH EXPERIENCE

Multiply-Accumulate Architecture for Sparse Deep Neural Network **Mar 2021-Present**
Nanjing University, Lab of Integrated Circuits and Intelligent System (ICAIS), Advisor: Prof. Li Du

- Proposed a new precision-scalable multiply-accumulate architecture for integers based on reconfigurable 4:2 compressor array.
- Designed specialized algorithms and architecture to address the load imbalance problems brought by data sparsity.

Float-Point Multiply-Add Fused Architecture for Deep Neural Network **Sep 2020-Feb 2021**
Nanjing University, Lab of Integrated Circuits and Intelligent System (ICAIS), Advisor: Prof. Li Du

- Proposed a new multiply-add fused architecture to support multi-precision inputs and parallel computation of multiple inputs' exponents and mantissas.
- Simulated different architectures of fixed-point/float-point multipliers using MATLAB, and implemented them using Verilog HDL.
- Analyzed the area, power, and timing of the designed circuits using Design Compiler and Cadence irun.

Quantization and Compression Techniques for Deep Neural Network **Mar 2020-Aug 2020**
Nanjing University, Lab of Integrated Circuits and Intelligent System (ICAIS), Advisor: Prof. Li Du

- Investigated various quantization and compression techniques to reduce deep learning accelerator memory bandwidth.
- Studied DCT/IDCT based activation compression technique and validated its effectiveness by retraining YOLO v3 model on COCO dataset.

NEMU (NJU Emulator) **Mar 2021-Jun 2021**
Final Course Project of Introduction of Computer Systems at Nanjing University

- Built a complete system emulator to support x86 architecture using C and created functions to run PC console games like the Chinese Paladin series games.
- Implemented a CPU core capable of executing x86 instructions, a memory module with cache, protection modes and paging functions, the function to emulate I/O devices, interrupts and exceptions.

Online Chat-Room Based on TCP/IP Protocol **Mar 2020-Jun 2020**
Final Course Project of Operating System and Linux Programming at Nanjing University

- Developed a Linux based online chatting room capable of supporting multiple clients concurrently, and implemented advanced functions such as file transmission, emoji sending and blog recording.
- Utilized darknet and YOLO v3 on Linux to implement the object detection and facial recognition functions.

HONORS AND AWARDS

- Excellence in National Training Program of Innovation for Undergraduates, Nanjing University 2021
- Outstanding Student, Nanjing University 2021
- First Prize in People's Scholarship, Nanjing University 2019, 2020

SKILLS

Programming: C/C++ Programming, Python, MATLAB, Verilog HDL, Chisel, Bash, TCL
AI Framework: Tensorflow, PyTorch
FPGA &IC tools: Design Compiler, ModelSim, Vivado, Multisim, Cadence. **Others**: OriginPro, Autodesk