

Yang (Adrian) Liu

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EDUCATION

Fudan University

Master of Science in Electronics Science and Technology

Shanghai, China

Sep. 2022 – Present

- **GPA: 3.85/4.00** **Rank: 1st** (out of 45) **Core Courses GPA: 4.00/4.00**
- **Research Field:** Design Automation, Integrated Circuit and System Design
- **Major Courses:** Advanced Digital Integrated Circuits Design, Parallel Computing, Discrete Mathematics & Optimal Decision, System-Level FPGA Design, Digital Signal Processing VLSI Design

Cornell University

Visiting: Graduate Intern in Electrical and Computer Engineering Department

Ithaca, USA

June 2024 – Jan. 2025

- **Research Field:** Domain Specific Compiler, Programming Language
- **Project:** Programming Model for Composable Accelerator Design, Tile-based Programming Interface

Fudan University

Bachelor of Engineering in Microelectronic Science and Engineering

Shanghai, China

Sep. 2018 – June 2022

- **GPA: 3.80/4.00** **Rank: 3rd** (out of 147) Graduated with Highest Distinction
- **Research Field:** Hardware Accelerator, Artificial Intelligence Application
- **Thesis:** A Hardware Acceleration Strategy of Squeeze-and-excite Network Based on the FPAI Chip and Compiler

RESEARCH EXPERIENCE

Research Intern, Computer Systems Laboratory

Cornell University, Ithaca, USA

June 2024 – Present

Advisor: Prof. Zhiru Zhang

Research Assistant, State Key Laboratory of ASIC and System

Fudan University, Shanghai, China

Feb. 2022 – Present

Advisor: Prof. Jun Yu, Prof. Kun Wang, Prof. Jianli Chen

Research Intern, Intelligence Computing Lab

Shanghai Fudan Microelectronics Group Co., Ltd, Shanghai, China

July 2021 – Feb. 2023

Advisor: Prof. Jun Yu, Jicheng Lu

Research Assitant, Video and Image Processing Lab

Fudan University, Shanghai, China

Aug. 2020 – May 2021

Advisor: Prof. Yibo Fan

PUBLICATION

- [1] **TransLib: An Extensible Graph-Aware Library Framework for Automated Generation of Transformer Operators on FPGA**
Yang Liu, Tianchen Wang, Yuxuan Dong, Zexu Zhang, Shun Li, Jun Yu, Kun Wang
43rd ACM/IEEE International Conference on Computer-Aided Design (ICCAD), 2024
- [2] **Deploying Diffusion Models with Latency-Oriented Scheduling and Memory Overflow Prevention Based on Graph Optimization**
Hao Zhou, Yang Liu, Hongji Wang, Enhao Tang, Shun Li, Yifan Zhang, Guohao Dai *et al.*
30th Asia and South Pacific Design Automation Conference (ASP-DAC), 2025
- [3] **Fitop-Trans: Maximizing Transformer Pipeline Efficiency through Fixed-Length Token Pruning on FPGA**
Kejia Shi*, Manting Zhang*, Keqing Zhao, Xiaoxing Wu, Yang Liu, Jun Yu, Kun Wang
34th International Conference on Field-Programmable Logic and Applications (FPL), 2024

- [4] **SDAcc: A Stable Diffusion Accelerator on FPGA via Software-Hardware Co-Design**
Hao Zhou, Yang Liu, Hongji Wang, Enhao Tang, Shun Li, Yifan Zhang, Kun Wang
32nd IEEE International Symposium On Field-Programmable Custom Computing Machines (FCCM), 2024
- [5] **CSTrans-OPU: An FPGA-based Overlay Processor with Full Compilation for Transformer Networks via Sparsity Exploration**
Yueyin Bai*, Keqing Zhao*, Yang Liu, Hongji Wang, Hao Zhou, Xiaoxing Wu, Jun Yu, Kun Wang
61st ACM/IEEE Design Automation Conference (DAC), 2024
- [6] **DIF-LUT: A Simple Yet Scalable Approximation for Non-linear Activation Function on FPGA**
Yang Liu, Xiaoming He, Jun Yu, Kun Wang
33rd International Conference on Field Programmable Logic and Applications (FPL), 2023
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- (*Papers Under Review*)
- [7] **DIF-LUT Pro: An Automated Tool for Simple yet Scalable Approximation of Nonlinear Activation on FPGA**
Yang Liu, Shuyang Li, Yu Li, Ruiqi Chen, Shun Li, Jun Yu, Kun Wang
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)

PROJECTS

- Allo** | *Python, C++, HLS, MLIR; Vitis, Pytest, CI* *July 2024 – Present*
- Explore the potential of agile design for programmable architecture with advanced programming model
 - Develop tile-based programming interface and relevant features for dataflow architecture
- TransLib** | *Python, Verilog HDL, C++, Shell; PyTorch, ONNX, Docker, Vivado* *June 2023 – May 2024*
- Proposed an automated and extensible framework for the accelerator generation of transformer networks
 - Proposed an innovative graph analysis and matching algorithms, ideal for large-scale networks
 - Designed a configurable template library of various operations to explore the design space
- DIF-LUT** | *Python, Verilog HDL, Shell; Vivado* *Feb. 2023 – Sep. 2024*
- Proposes a simple yet scalable and effective approximation for Non-linear function
 - Designed an automation toolchain for table generation and precision evaluation
 - Integrated as an computing unit in FPGA-based accelerator for DNN and Nerf
- SEResnet Accelerator on SOC** | *Verilog HDL, C++, Python, Shell; Vivado, VStudio* *Feb. 2022 – Dec. 2022*
- Organized the acceleration flow of hardware and software co-design with the compiler
 - Deployed specific operations on programmable logic resource of SOC
 - Programmed and registered C++ operations on host CPU for simulation
- The Straggler - A Vertically Scrolling Shooting Game** | *C++; VStudio* *Feb. 2021 – June 2021*
- Pay homage to the classic shooting game – Raiden, based on a C++ pixel engine
 - Developed various game mechanics including skill upgrades, level progression, and boss battles
 - Incorporated numerous game features, including pause-and-save, background music, and sound effects

COMPETITIONS

- 2024 CAD Contest at ICCAD** *May 2024 – Sep. 2024*
- **Outcomes: Honorable Mention Team**, Participation Mode: Team
 - Contest Problem: Power and Timing Optimization Using Multibit Flip-Flop
 - Implemented a comprehensive cost model for metrics such as area and delay
 - Developed a visualization interface for layout placement results
- 2021 AIWIN Fall – ECG Diagnosis Track** *Oct. 2021 – Feb. 2022*
- **Outcomes: Fifth Place**, Participation Mode: Team
 - Proposed post-process algorithms for feature correlation analysis
 - Implemented mathematical feature extraction as a prior

- Employed existing Python libraries to make further adjustments to the network's prediction

2021 Shanghai Digital Transformation Intelligent Algorithm Competition Aug. 2021 – Nov. 2021

- **Outcomes: Grand Prize**, Participation Mode: Team (leader)
- Designed a multi-DNN application scheme for posture recognition in urban scenarios
- Proposed and integrated filter algorithms in the object detection phase
- Collected and transformed appropriate dataset for the urban scenarios

Autonomous Obstacle-Avoidance Mini-Car Competition July 2021

- **Outcomes: Second Place**, Participation Mode: Team (leader)
- Completed the control design and physical assembly based on embedded systems
- Programmed control behaviors using assembly language on the 51 microcontroller platform
- Soldered peripheral electrical components to the PCB board

AWARDS AND HONORS

- **Fudan University BYD Endowed Scholarship** Oct. 2024
- **Fudan University Outstanding Student (Graduate)** Oct. 2024
- **Fudan University Outstanding Administrative Assistant** June 2024
- **Fudan University Graduate Student Excellence Scholarship First Prize** Dec. 2023
- **Shanghai Outstanding Graduates (Undergraduate)** June 2022
- **Fudan University Undergraduate Student Excellence Scholarship First Prize** May 2022
- **Fudan University Outstanding Student (Undergraduate)** Oct. 2021
- **Shanghai Municipal Scholarship** Dec. 2020
- **Fudan University Outstanding Internet Culture Work: Second Prize** Dec. 2019

Co-founded a student mental health social media page, achieving 2k+ followers and nearly 30k views in one semester

ACADEMIC AND EDUCATIONAL ENGAGEMENT

61st ACM/IEEE Design Automation Conference (DAC)

Moscone West, San Francisco, USA

June 2024

Oral TrafficHD: Efficient Hyperdimensional Computing for Real-Time Network Traffic Analytics

33rd International Conference on Field Programmable Logic and Applications (FPL)

Chalmers University of Technology, Gothenburg, Sweden

Sep. 2023

Poster DIF-LUT: A Simple Yet Scalable Approximation for Non-linear Activation Function on FPGA

Teaching Assistant: Methodology of Integrated Circuit Design

Fudan University, Shanghai, China

Spring 2023

Teaching Assistant: Psychological Training of Success Qualities

Fudan University, Shanghai, China

Fall 2019

OTHER WORK EXPERIENCE

Administrative Assistant, Mental Health Center of Fudan University

Fudan University, Shanghai, China

Feb. 2024 – June 2024

Middle Manager, Work-Study Program Entity of Fudan University

Student Book Kiosk, Fudan University, Shanghai, China

Jan. 2020 – Jan. 2021

TECHNICAL SKILLS

Languages: Python, C/C++, Verilog HDL, HLS, Shell, Assembly, Tcl, etc.

Developer Tools: Vivado, Vitis, Quartus, Docker, Visual Studio, PyCharm, VMWare Workstation, L^AT_EX, etc.

Frameworks & Libraries: PyTorch, OpenCV, Pytest, NetworkX, Matplotlib, etc.