Curriculum Vitae

Hanqing ZHU

Shanghai Jiao Tong University
Microelectronics science and technology

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EDUCATION

School of Electronic Information and Electrical Engineering, Shanghai Jiao Tong University **Sept** 2016- **Jul** 2020

B.E. in Microelectronics science and technology

Zhiyuan Honors Program of Engineering (an elite program for top 10% students in SJTU)

Major GPA: 89.25/100, Overall GPA: 89.12/100, Advanced GPA (for last four semesters): 91.65/100

Ranking: 2/57 (Sophomore, junior GPA Ranking 1st/57)

Core Courses(Selected): Circuit Theory (94), Probability and Statistics (100, rank 1st), Signals and Systems (95, rank 1st), Design of Digital Integration Circuits (94, rank 1st), Chip Design Methodology for Advanced Logic System (91, rank 1st), Digital Signal Processing (98, rank 1st), Computer Processors and System(89)

Peter the Great St. Petersburg Polytechnic University, Russia **Aug** 2018- **Sept** 2018

Summer School (fully English) focusing on Information Technology Module (Modern SAP Technologies)

Modern SAP Technologies and Russian Course

Course Grade: 98/100

University of Texas at Austin, USA **July** 2019- **Oct** 2019

Summer Research Program, supervised by Professor David. Z. Pan, IEEE fellow & SPIE fellow, Department of Electric and Computer Engineering

HONORS & AWARDS

Outstanding undergraduate scholarship (Awarded to only 5 undergraduate students, ￥30,000 funded by Fontile Education Fund) **2019**

The Samsung Scholarship (top2%, only one in our department) **2018**

The First & Second Prize Scholarship **2017&2018**

Zhiyuan College Honors Scholarship (Top 10% students of Shanghai Jiao Tong university) **2016**

Excellent league cadre of Shanghai Jiao Tong University **2019**

The scholarship for academic progress **2018**

First Prize in China Undergraduate Mathematical Contest in Modeling, Shanghai Division (CUMCM) **2018**

Full scholarship for summer school funded by SPbPU (only two students among C9 universities in China got full scholarship) **2018**

"Color for love" bronze prize of Chinese college students' rural supporting education **2017**

RESEARCH EXPERIENCES

Wireless thin – film Antenna on Turbine Blade Surface Design: SJTU Undergraduate Participation in Research Program (PRP)

Research Assistant **Sept** 2017 -**Oct** 2018

Advisor: Li Duan, professor of Ministry of Education Key Laboratory of Thin Film and Microfabrication Technology, SJTU

- Designed and fabricated three integrated antennas with the logo of Shanghai Jiao Tong University with a maximum size of 22mm and lowest echo lost -21.93dB
- Analyzed the collected data and extracted relationship between basic parameters and characteristic performance
- Found the interactive superposition effect between multiple integrated antennas by studying the fluence of common ground or not
- A paper submitted to <<Journal of Shanghai Jiao Tong University >>, 2019

Low complexity MIMO detection algorithm optimization with DL network and VLSI implementation

Research Assistant **Oct** 2018-Present

Advisor: Guanghui He, associate professor of School of Microelectronics, SJTU

- Concentrating on how to apply DL methods to large-scale MIMO system especially in Detection

- Try optimizing traditional MIMO detection Algorithm mainly on MPD algorithm to get a low BER performance and fast convergence rate aided by Deep Learning methods
- Propose some simplify methods to reduce the algorithm complexity especially aided by neural networks
- Further realize VLSI implement using our proposed algorithm

A new heuristic algorithm implementation used for Partition methodology in Physical Design

Research Assistant **July 2019 – Oct 2019**

Advisor: David. Z. Pan, professor, IEEE fellow & SPIE fellow, Department of electrical and computer engineering

- Proposed a new heuristic mechanism used for Graph/Hypergraph Partitioning Problem based on K-means and Gas-Diffusion mechanism and using BFS to optimize initial seeds generation taking graph structure into account
- Initial version outperformed the state of art tools like Metis not only on edge-cuts but also on boundary vertices while getting ~5% - ~10% performance improvement
- Expected to speed up current implementation through parallel computing and GPU for internal parallel structure and matrix computing kernel
- Used cpp-taskflow to accelerate my run-time and get about k times acceleration if we have k partition

PROJECTS EXPERIENCE

CNN-Classification on FPGA | Course project |

- Reproducing a fast FPGA prototyping framework for high performance CNN deployment on PYNQ platform and making some improvement
- Transplanting the PYNQ to the ZYNQ-7000 and implement basic functions using Python directly by Jupyter Notebook
- Skilled in high level synthesis (HLS) tools and FPGA development boards

High Performance VLSI Architecture for HEVC Motion Estimation | Course project |

- Proposed an efficient VLSI architecture compatible for HEVC (High Efficiency Video Coding) ME full search algorithm targeting processing 1920×1080p video @30fps and supporting 4*4 pixels block size and [-8,8) search range under SMIC 0.18um technology (The frequency requirement is 100MHz)
- Adopted 16 Processing Elements as SAD computing core module where each one computes 4*4 pixels computing and local memory to reduce the off-chip bandwidth and serve as data buffer for further computing using ping-pong mechanism
- Using SMIC 0.18um technology, the proposed architecture is synthesized at the maximum work frequency of about 74MHz and power of 845.18mW
- Using ICC compiler to complete physical design part with some constraints liking changing some P/G pins' position or adding additional P/G pin to improve IR drop

LEADERSHIP AND ACTIVITIES

Siyuan Commonweal Organization |Shanghai Jiao Tong University| Project director **Sept** 2017 – **July** 2019

- Took efforts to improve education quality in China's poorest places with my heart of gratitude as one who also comes from rural and poverty-stricken areas
- Be responsible for the Rural Support Education Program in Siyuan Commonweal Organization for two years
- Chaired three support education seminars and more than thirty interviews to select about 110 volunteer teachers from Shanghai Jiao Tong University, East China Normal University and Shanghai International Studies University.
- Established collaboration with three new support schools and offered free summer class for more than 700 students in rural China during 2018 summer
- Went to Eryuan as a supporting education student volunteer for one month and awarded with "Color for love" bronze prize of Chinese college students' rural supporting education for extraordinary volunteer performance

SKILLS

Programming Languages: python, C++, MATLAB, Verilog

VLSI tools:

Cadence and Hspice tools

Xilinx FPGA board development tools

Others: Latex & Origin & Git