WENJI FANG

wenjifang@ust.hk · (+86) 185-5162-0517 ·

Education

Nanjing university of Aeronautics and Astronautics (NUAA), Nanjing, China 2017 – 2021

B.Eng. in Electrical Engineering and Automation
GPA: 3.9/5.0 (89/100)

Work Experience

Hong Kong University of Science and Technology (Guangzhou) Dec. 2021 – Present

Research Assistant Advisor: Hongce Zhang

Formal property verification of microprocessors

Peng Cheng Laboratory Jul. 2021 – Dec. 2021

Digital IC Physical Design Intern

Back-end physical design of a SoC from RTL to GDSII layout

Notable projects

Symbolic-Execution-Guided Invariant Synthesis for Microprocessor Verification
Dec. 2021 – Present

- Achieved a end-to-end unbounded formal verification framework for microprocessors
- Constructed a symbolic simulation framework to get the abstract states of the microprocessor
- Generated the inductive invariants to implement the unbounded checking of the properties
- Tested the framework with multiple pipelined processor test cases

"One Student One Chip" Plan Phase III Jul. 2021 – Dec. 2021

- Responsible for the physical design of the digital IC; used commercial EDA tools to complete the whole back-end design process, including Logical Synthesis, Static Timing Analysis, Formal Equivalence Checking, Place & Route, Physical Verification, etc; and wrote relevant design document
- Connected with SoC team to jointly complete clock specification, standard design constraints and other relevant tasks
- Participated in the front-end RTL system design; realized the design of a single cycle processor with Verilog based on the RV64I instruction set architecture of RISC-V

Visualization of Digital Filter based on PYNQ – XILINX FPGA Summer School
Jun. 2021 – Jul. 2021

- Adopted the top-down development idea; Divided the specific modules based on expected functions, discussed the interfaces among modules, and realized a software and hardware collaborative design based on PYNQ
- Implemented a graphical user interface based on python at the processing system of PYNQ to display the filter frequency response curve in real time
- Achieved the block design at the Programmable Logic of PYNQ based on the data flow; Used DMA interface to solve the data of AXI and transmit the coefficients to the IIR filter algorithm

Real time Visible Spectrum Analysis Chip System (Undergraduate Graduation Project)
Nov. 2020 – Jun. 2021

- Based on the silicon photonics platform, used Ansys Lumerical and IPKISS to model and simulate the devices and systems of the spectrometer hardware signal sampling chip, drew the layout of the 180nm process node and sent to the foundry for tape-out

- Utilized linear regression and compressed sensing based on machine learning to solve the ill-posed underdetermined equation generated by the system, and realized the recovery of unknown spectral signals
- Completed the undergraduate graduation thesis and passed the defense; Applied for two national invention patents; Participated in the writing of an English journal and prepared to contribute

Design of Wide Input Power Supply Circuit based on the Topological of DC-DC Switching Power Supply Oct. 2019 – Feb. 2020

- Completed a system of converting the DC voltage from 16V (Range 9.6-18v) to 5V which drove both of DC and Pulse Loads
- Calculated the resistance, inductance, capacitance and other component parameters according to the buck circuit topology and performance index
- Respectively tried LM2678 PWM control chip, analog PWM closed-loop control based on operational amplifier and digital PWM closed-loop control based on DSP to realize the voltage closed-loop voltage stabilization system
- Draw schematic circuit diagram and PCB, welded components and debugged circuit performance until it would meet performance requirements

Honors and Awards

Finalist Prize of the Mathematical Contest in Modeling and Interdisciplinary Contest in Modeling	2020
1st Prize of the Electronics Circuit Competition of NUAA	2019
Infineon Enterprise Scholarship	2020
Outstanding Volunteer, 2019 Youth Science Camp (Jiangsu Camp)	2019
Academic Scholarship of NUAA	2017-2020
Merit Students Scholarship of NUAA	2017-2020
Merit Student of NUAA	2017-2020

Skills

- Electronics Software
  Cadence and Synopsys EDA tools; Vivado; Altium Designer; Keil; Multisim; Proteus
- Programming Language
  Python; Verilog; C Language; Assembly Language
- Mathematical Software
  MATLAB, SPSS