Zhang Yunfan

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EDUCATION

Duke University   Aug 2023 - May 2025
- *M.S. in Electrical and Computer Engineering*
- GPA 4.0/4.0. 5 A+
- Teaching Assistant in course: Fundamental of Computer System and Engineering
- Relevant Coursework: digital and analog VLSI design, semiconductor device for IC, computer architecture, C/C++ programming, full-stack IoT system development, deep learning neural net and random signal and noise.

University of Nottingham Ningbo China (UNNC)   Sep 2019 - Jun 2023
- *BEng (Hons) Electrical and Electronic Engineering*
- GPA 3.94/4.0 (Grade 78/100). Two-year Provost's Scholarship (top 1.5% of students) and distinguished graduates.
- Attended FURP research program, summer mini semester, High-flyer scheme.
- Relevant Coursework: analog and digital electronics circuits, radio frequency (RF), robotics and control, sensing systems, embedded computing, signal processing, C/C++ programming, power and energy, artificial intelligence

Department of Computer Science, National University of Singapore   Jul - Aug 2021
- Summer Project *Artificial Intelligence of Things*
- Developed project *Intelligent Irrigation System* with KNN network, implemented a small prototype for the system, including circuit design, IoT architecture, data management, and front-end design.

Peking University   Jul - Aug 2020
- Summer School *Python Programming and Application*

PROJECT & RESEARCH

Individual Project for Design for Test, **ATPG Implementation with Siemens Tessent**   Jan - Jun 2025
- Implemented scan chain insertion and ATPG pattern generation using Siemens Tessent tools, optimizing test compression strategies for an RISC-V processor.
- Automated DFT processes with TCL scripting in Tessent Shell, enhancing scan architecture analysis and test validation.
- Explored Tessent TestKompress for improving test efficiency and compression.

Individual Research for mixed-signal IC design, **Blood Glucose Monitoring Front-end IC Design**   Jun 2024 - May 2025
- Designed the schematic of the folded-cascode operational amplifier, switched-capacitor integral and subtractive circuit as the sensor to detect the continuous uA level (0.3-45) current.
- Designed the schematic of the second-order delta-sigma 12-bit ADC for measuring voltage from the front-end and also the layout of the chip.

Individual Project for analog IC design, **50MHz 8-bit SAR ADC Circuit with Control Logic**   Jan - May 2024
- Designed schematic and layout for 50MS/s 8-bit SAR ADC with split charge sharing DAC, two-stage rail-to-rail fast response dynamic comparator and continuous sampling control logic with low power consumption (936uW @ Max sampling rate) and adjustable sampling frequency logic.
- The pre-amplified two-stage dynamic comparator achieves a fast response time of 124ps for a differential input of 10uV, with low power consumption.

Team project for deep learning, **Self-supervised learning: SimCLR and RotNet**   Jan - Apr 2024
- Investigated self-supervised learning (SSL) techniques to reduce reliance on labeled data for visual representation learning, highlighting trade-offs in batch size, training epochs, and computational cost..
- Implemented and fine-tuned SimCLR and RotNet on CIFAR-10, leveraging ResNet50 and ResNet18 architectures.
- Designed and evaluated a modified NT-Xent loss function with multiple positive augmentations, improving accuracy by 0.87% (Top-1).

Individual Project for VLSI Design, **Adjustable PWM generator**   Oct - Dec 2023
- Designed schematic and layout for adjustable frequency and duty cycle PWM generator with relatively high resolution (16-bit resolution) and lower power consumption (15.12uW@10MHz clock) using Cadence Virtuoso TSMC 65nm Tech package.
- Validate design using vector file for bulk testing and simulation.

Individual Project for computer system, **Computer System Architecture Design**   Oct - Dec 2023
- Designed a MIPS instruction processor using structural Verilog with additional customize instructions on FPGA.

- Designed a finite-state machine for peripheral devices such as PS2 and VGA ports for keyboard and display.
- Utilize the instruction set to achieve flappy-bird game with score recording, pseudo-random number generation, etc.

Individual Research, **Department of Electrical and Electronic Engineering, UNNC**   Jun 2022 - April 2023
- Project *Non-invasive Senor Intelligence for Smart Buildings*.
- Designed sensor circuits and PCBs, planned data flow pipeline, developed embedded sensor program for transmission and built IoT network with SQL database.
- Combining Spectrum Clustering and LSTM model to identify indoor human activity with 89.2% and 90.3% accuracy in large and medium-scale indoor environments. The system would have relatively strong adaptability.

Research Assistant, **Department of Electrical and Electronic Engineering, UNNC**   Jan - April 2022
- Participated in project *Ultra-Wideband Indoor Positioning with Obstacle*
- Performed literature review in related fields, and carried out experiment preparation including ground mapping, initial data collection and data screening.
- Used regression random forests to detect and mitigate positioning errors caused by reflected signals, finally achieving a detection accuracy of approximately 80%.

Team project, **Small Electric Vehicle with Vision Recognition**   Sept 2021 - Jun 2022
- Designed DC-DC forward converter for the charging system with 50W rating power.
- Utilized OpenCV with Raspberry Pi for image processing to achieve relevant tasks and the software system design
- Programmed a CPLD using behavioral Verilog to achieve UART communication with a seven-segment display.
- Designed and integrated the vehicle's PCB, including motor control, audio amplification, power management, and sensor interfaces (gyroscope, ultrasound), enabling robust real-time performance.
- Designed digital filters and performed Fourier analysis for Doppler radar signal processing.

EXTRACURRICULAR

Member of UNNC Team, **RoboMaster University Series National Competition**   Oct 2021 - Jan 2022
- Trained in the RoboMaster national competition
- As a member of the Electrical Control Team, developed the robot's motion control program with an STM32 microcontroller to realize the robot's walking mechanism of the steering wheel from Mecanum wheel and shooting system
- Liaised between the Algorithm Team and Mechanics Team to solve control programming problems originating from changes in the mechanical structures, transmission protocol and signal format

Deputy Director, **Administration Office, WEAVER Organization UNNC**   Jun 2020 - Jun 2021
- Oversaw financial operations of the association, developed budget plans, managed external public relations, and organized university-wide cultural events
- Assisted Admission and Career Development Office for admission in Hangzhou city

INTERNSHIP

Intern, Software Development Department, **Continental AG, Shanghai**   Jun - Aug 2023
- Assist software development validation on the Xiaomi vehicle system.
- Studied vehicle structure on both hardware and software aspects.

Intern, Embedded Systems Department, **Serendipity, UNNC Incubator**   Feb - Jun 2022
- Participated in the preliminary research and development of the second generation of intelligent face cleaner
- Performed industrial product software and hardware development, chip production and testing, chip programming, and implementing and debugging product peripherals sensors and actuator
- Studied Linux C kernel programming through hands-on problem-solving

SKILLS

- Programming Languages: C / C++, Python, MATLAB, Verilog HDL
- Design Software: Cadence Virtuoso, Altium Designer, MATLAB, SOLIDWORKS
- Hardware Prototype: Mixed-signal design for schematic and layout, PCB and electronic circuit design, soldering, mainstream embedded chips programming, signal processing and Internet of Things system pipeline.
- Design Testing & Test Compression: Simens Tessent
- Robot system control and programming
- Deep learning: includes CNN and RNN as well as pruning and compression technics.