

Yue Zhu

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EDUCATION

University of Virginia, Charlottesville, VA

Aug 2022 – Dec 2023 (Expected)

Master of Computer Science, GPA: 4.0/4.0

Core Courses: Advanced Embedded Computing Systems (A+), Autonomous Mobile Robots (A+), Cloud Computing (A+), Low Power Wireless Transceivers for IoT, Smart and Healthy Buildings, Network Security and Privacy, Computer Architecture

ShanghaiTech University, Shanghai, China

Aug 2017 - Jun 2021

B.E. in Electronic Information Engineering

Core Courses: Introduction to Embedded Systems, Web & Text Mining, FPGA-based Hardware System Design, Machine Learning

RESEARCH EXPERIENCE

Link Lab, University of Virginia

Virginia, USA

Research Assistant, Supervisor: Prof. Bradford Campbell

July 2023 – Present

Software Defined Solar Sensor (paper in progress)

- Implemented an ultralow power energy-harvesting sensor using solar panel as the harvester as well as sensor
- Designed the event-based mode-switching software to save energy while capturing and transmitting data to a server
- Optimized power to under 90 uW in SA-ADC high-frequency 16X-oversampling mode and under 30uW in LF mode

Mechatronics and Energy Transformation Laboratory, ShanghaiTech

Shanghai, China

Research Assistant, Supervisor: Prof. Junrui Liang

July 2020 - March 2022

Motion-powered Gameboy (paper accepted by ACM Sensys2022 [[demo](#)])

- Implemented the first robust, purely motion-powered battery-free personal electronic mobile gaming device
- Investigated the task-based energy management method on Cortex-M4F nRF52 SoC to meet the energy constraint
- Employed energy-aware checkpointing method using FRAM so that a snapshot could survive spanning power outages
- Designed and implemented PCB and 3D-printed mechanisms to form a user-friendly compact prototype

Battery-Free QR Tag

- Developed a BLE tag and a JavaScript mobile program that could perform pairing, throughput, and image updating
- Optimized energy consumption per frame from 72mJ to 3.3mJ by optimizing control flow, employing FRAM as non-volatile memory, minimizing idle power consumption, maximizing the idle period, and optimizing SPI

PROJECT EXPERIENCE

RTOS-based Gaming System on TM4C123G DK and MKII Booster Pack ([demo](#))

March 2023 - May 2023

- Implemented a graphic driver to enable multi-layer image generating and a simplified Plants vs. Zombies video game
- Optimized jitter and multi-thread utility using Dynamic Priority Scheduler and used semaphore to prevent deadlocks
- Implemented a page system, software drivers of FIFO for the joystick, and an interface for the PWM buzzer

Systolic Matrix Multiplication Module on Xilinx FPGAs (VHDL [Code](#))

Oct 2020 - Nov 2020

- Implemented a PE module that performs the multiply-accumulate operation, a cascaded counter module to generate the address of input data, a shift register FIFO module to control the cycle of data arrival
- Implemented the testbench to autonomously process the systolic array and output the result to a file

AWARDS & PUBLICATIONS

The 20th ACM Conference on Embedded Networked Sensor Systems (Sensys 2022)

Motion-powered Gameboy [[Publication](#)]

Author: Yue Zhu, Xin Li*, Junrui Liang*

2019 Texas Instruments National Undergraduate Electronic Design Contest, Shanghai Division [[The Second Prize](#)]

SKILLS

Programming: Embedded C, Python (ROS, Web Crawler, MySQL, PyQt, and ML), Matlab, VHDL, Assembly, Web

Platform: Nordic nRF52, Linux, ROS, Xilinx FPGA, STM-32, TM4C123, Arduino, Raspberry Pi, WeChat MiniProgram

Tools: VS Code, Git, Altium Designer, Solidworks, Keil, Multisim, Docker, Vivado, Cadence, VMWare, MS Office suite