Yue Zhu

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CaveCanem1240.github.io

EDUCATION

University of Virginia, *Charlottesville, VA* *Aug 2022 – Dec 2023 (Expected)*
Master of Computer Science Track, **GPA: 4.0/4.0**
Core Courses: *Autonomous Mobile Robots (A+), Cloud Computing (A+), Low Power Wireless Transceivers for IoT, Smart and Healthy Buildings, Advanced Embedded Computing Systems, Network Security and Privacy*

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

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 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
- Investigated a battery-free full-duplex BLE E-ink display node based on task-based checkpointing that could robustly perform pairing, throughput, and image updating on Cortex-M4F Nordic nRF52 platform
- 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
- Developed a JavaScript-based mobile program to automatically fetch advertising signals and transmit data

PROJECT EXPERIENCE

Matrix Multiplication module (VHDL *Code*) *Oct 2020 - Nov 2020*
- Designed a hardware module targeting Xilinx FPGAs that multiply two matrices in a systolic fashion
- 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

Circuit Parameters and Short-circuit Position Detection System *Jul 2019 - Aug 2019*
- Developed RTOS-based RLC circuit parameters and short-circuit position detection system on STM-32 platform
- Investigated theoretical characteristic frequencies of RLC combined circuits using Bode Plot and MATLAB
- Developed the algorithm to classify the structure of unknown RLC circuits at theoretical characteristic frequencies

AWARDS & PUBLICATIONS

The 20th ACM Conference on Embedded Networked Sensor Systems (Sensys 2022)
Motion-powered Gameboy [*Publication*]
Author: **Yue Zhu,** Xin Li*, Junrui Liang*

Best Paper, the 3rd International Conference on Vibration and Energy Harvesting Applications
Dynamic Analysis of a Transient Plucking Energy Harvester towards Battery-free Motion-sensing System [*Award*]
Author: Xin Li, Guobiao Hu, Hong Tang, **Yue Zhu,** Junrui Liang*

2019 Texas Instruments Cup National Undergraduate Electronic Design Contest Shanghai Division
Circuit Parameters and Short-circuit Position Detection System [*The Second Prize*]

SKILLS

Programming: Embedded C, Python (ROS, Web text mining, and Tensorflow), VHDL, Web, JS, Assembly, Matlab
Platform: Nordic nRF52, Linux, ROS, Xilinx FPGA, STM-32, Arduino, Raspberry Pi, WeChat MiniProgram
Tools: Altium Designer, Solidworks, Keil, Multisim, Proteus, Vivado, Cadence, Git, VMWare