Yue ZHU

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EDUCATION

ShanghaiTech University *Shanghai, China*
B.E. in Electronic Information Engineering *Aug 2017 - Jun 2021*
Core Courses: *Introduction to Embedded Systems, Introduction to Communication Systems, Web and Text Mining, FPGA-based Hardware System Design, Introduction to Control, Machine Learning, Digital Integrated Circuit Design*

RESEARCH INTEREST

Embedded Systems, Power Electronics, Circuits, Human-Computer Interaction, Internet of Things

RESEARCH EXPERIENCE

Mechatronics and Energy Transformation Laboratory, ShanghaiTech *Shanghai, China*
Research Assistant, Supervisor: Prof. Junrui Liang
Project 1: Motion-powered Gameboy *Aug 2021 - Present*
- Implemented the first robust, purely motion-powered, user-friendly battery-free personal mobile gaming device
- Investigated task-based energy management method and software checkpointing using FRAM
- Document and Demo (the research paper is on progress)

Project 2: Battery-Free QR Tag *Jul 2021 - Present*
- Investigated the world's first full-duplex battery-free BLE node based on mechanical potential energy pre-charging
- Developed the Wechat mini program interface to automatically fetch the power-on period of the battery-free device
- Realized battery-free reception, QR code update, and battery-free transmission of node's status

Project 3: Battery-Free E-ink Tag (Capstone Project) *Jul 2020 – Jun 2021*
- Optimized energy consumption per frame of E-ink updating respectively
- Proposed to design a battery-free HCI system by bistable energy harvester and bistable display
- Realized battery-free frame updating on E-ink

PROJECT EXPERIENCE

Digital Integrated Circuit Design: 4 bits Processor with 16x8 bits SRAM *Jun 2020 - Jul 2020*
Advisor: Prof. Xufeng Kou
- Proposed schematic and layout for 4 bits arithmetic logic unit with 16x8 bits data static random access memory
- Optimized the worst-case delay of the ALU and SRAM to below 2ns with mirror adder and logical efforts

Embedded Systems: Multi-capacitors Repeating Coil Gun *May 2020 - Jul 2020*
Advisor: Prof. Junrui Liang
- Designed and simulated the schematic based on Arduino and developed corresponding user interface
- Designed PCB by adopting Altium Designer and iterated hardware prototypes
- Optimized the maximum voltage capability from 60V to 150V by replacing power MOSFET with IGBT

NUEDC Project: Black Box RLC Parameter and Structure Detection System *Jul - Aug 2019*
Advisor: Prof. Haoyu Wang

- Developed STM32-based RLC circuit parameters of the black box detection system
- Investigated theoretical characteristic frequencies of RLC combined circuits using Bode Plot and MATLAB
- Developed the algorithm to classify the structure of RLC circuit in the black box at theoretical characteristic frequencies
- Won the second prize of 2019 TI Cup National Undergraduate Electronic Design Contest, Shanghai Division

Independent Project: Multi-device Collaborative Object Recognition *Nov 2018 - Dec 2018*
Open-sourced on Github
- Realized the edge computing based on PC (user), Raspberry Pi (computing nodes), and Intel Neural Compute Sticks (computing resources)
- Implemented the functionality of collaborative object recognition by employing SMB as the file transfer protocol
- Optimized the time consumption of collaboration per frame to 1.39s (2.21s on PC) by applying the system

How to Write Answers with Stronger Traffic-driving Capability on Quora *Jul 2018 - Aug 2018*
Advisor: Prof. Yizhou Lu, *University of California, Los Angeles (UCLA)*
- Applied web crawler to fetch two topics: Republican Party and Democratic Party
- Proposed conclusion that the following five variables were important in increasing answer's upvote count: length of sentence, lexical diversity, sentiment polarity, readability, and total words counts and subjectivity
- Built model to estimate the future upvotes for new posts and the final cross-validated accuracy was 89%

Design Thinking: Stock Investment Simulation App Using Web Crawler *May 2018 - Jun 2018*
- Realized investment simulation App using real-time stock data
- Employed user interface based on web and database based on the web crawler

EXTRACURRICULAR EXPERIENCE

Volunteered to propagandize Chinese traditional woodwork, *Shanghai, China* *Oct 2020*
Volunteered to help villagers in *Xianshan village, Sichuan province, China* *Jul 2018 - Aug 2018*

HONORS

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
Author: Xin Li, Guobiao Hu, Hong Tang, **Yue Zhu,** Junrui Liang*

2nd Prize, 2019 TI Cup National Undergraduate Electronic Design Contest Shanghai Division

SKILLS

Programming: Embedded C, FPGA, Web, Web text mining, Linux
Software: Altium Designer, Solidworks, Matlab, Multisim, Proteus, Vivado, Cadence, Adobe
Embedded System Development: low power system design, PCB design, 3D model design, woodwork