Shiyu Guo

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Education

Northwestern University, Evanston, IL — June2019(anticipated)
- Master of Science in Computer Engineering (**GPA:** 3.92)

University of California, Irvine, Irvine, CA — Aug.2018-June2019

Southeast University (SEU), Nanjing, China — Sept.2015-June2018
- Bachelor of Engineering in Electronic Science & Technology **(GPA:** 3.63**)**

Experience

ASIC digital design | Eyeriss-like Energy-Efficient Deep Convolutional Network Accelerator *NU, 2019*
- I implement an Eyeriss-like accelerator and built the ASIC design with Genus for synthesis, Innovus for backend Layout design and Xcelium for simulation and verification.
- I implement a customed dataflow scheme to support highly parallel compute paradigm to optimize the energy cost by data movement from on-chip and off-chip. And I implement data statistics to minimize energy by zero gating to avoid unnecessary reads and computations.

FPGA design | Tank Duel Game *NU, 2019*
- I implement VGA control and display for the game, LCD display for the game result, seven-segment display for scores, ps2 keyboard for user input and all the game logic using VHDL.
- The tools/device I used are Quartus for compiling the design, ModelSim for simulation and Altera DE2-115 FPGA board.

Embedded System Modeling | Canny Edge Detector for System-on-Chip Design *UCI, .2019*
- I transfer Canny Edge detector from C to a System-Level Description Language(SLDL) Spec C(System C) to process a stream of video frames. I created a structural hierarchy to the top level behavior and implement queue-type channels for communication.
- I profile the application components and pipelined the design into 4 stages and replace all the floating-point arithmetic with fixed-point calculations with Non_Max_Supp block to improve the speed.

Android | Medical Drone System based on YOLOv3, Android app and DJI MobileSDK *UCI, 2018-2019*
- We build a Medical Drone System. My responsibility is to develop the User App. I developed an App which had an User-friendly interface and could send user's location and different request to the server.
- When the server receives a request, it will send the message to Control App. Control App will control the drone automatically to the user based on the GPS location and user's request.
- This project also has a github page: https://github.com/MICHAEL-ZENGZF/Medical-Drone-System/tree/Document

Cyber-physical system | Food Nutrition Estimation glasses *UCI, Fall 2018*
- I choosed MobileNet structure as CNN model and trained it using the "food-101" dataset. The system is based on Google Vision kit and a glasses with camera. I stored the picture taken by the glasses cam and send it to the RPi with WiFi.
- I used SQLite3 database to store the data.
- I used the plate size as reference. And I used the RGB color to separate the background, plate and the food region. I divided the shape of food into six types and designed formulas for each type of food and get volume. The model can achieve accuracy rate of 59%. And MATLAB is used to show GUI output.

Student Research Training Program: Smart Home *Sept.2017-Apr.2018*
- I developed a smart dormitory system based on Raspberry Pi, Arduino, LM35D Precision Centigrade Temperature sensor, light sensor, HC-SR501 PIR motion detector, buzzers, and PiCam.
- By control the relay, the system could control AC by the temperature, light by the motion, and user could set alarm when leaving the home and the alarm will ring if there's infrared signal detected when user is away. And I used MJPG-streamer which can get the stream result from the PiCam connected to the Raspberry Pi to get the result of the picture uder user's request and send it through WeChat.
- I developed a WeChat port to send and receive user's request by using the API Itchat so that there's no need to download any apps and is very convenient to use.

Karaoke Music Lab based on signal process and MATLAB MIDI Toolbox *June2017-Sept.2017*
- I used the MATLAB programming environment to deflate, scale, delay the sound signal.
- I used MATLAB to control the multimedia card on the computer to collect and play back the sound signal.
- According to the correspondence between the sound name and the frequency, designed the function to calculate the frequency corresponding to each phonetic name based on the score.
- Synthetic background music and vocals.

Skills and Courses

- Skills: VHDL, Verilog, MATLAB, python, Quartus, ModelSim, Cadence Virtuoso, Innovus, SystemC, C, C++, Java, CUDA, Swift, Linux OS, SPICE, CMOS VLSI design, Digital Image Processing
- Courses: Computer Architecture, Advanced Low Power Digital and Mixed-signal IC design, ASIC and FPGA design, Embedded System Modeling, Parallel Computer Systems, Introduction to Machine Vision, Digital Image Processing, Integrated Electronic Circuit Design, Engineering Data Structures and Algorithms