Xiangyu Zhou

josiath@berkeley.edu

EDUCATION

Southeast University   08/2017 - 06/2021
- Bachelor of Science in Electronic Science and Technology
- GPA: 3.69/4.0

University of California, Berkeley   08/2019 - 12/2019
- Undergraduate Exchange Student
- GPA: 3.76/4.0
- Courses: Data Structures, Great Ideas of Computer Architecture (Machine Structures), Electromagnetism and Optics

RESEARCH PROJECTS

Digital Recognition Based on Field-Programmable Gate Array (FPGA)   08/2020 - 11/2020

Leader, Advisor: Researcher Yongming Tang (Southeast University)
- Designed the HDMI module, understood the time sequence of the camera ov5647, wrote programs of the HDMI driver used to connect the camera and FGPA with verilog based on the parameters of time sequence
- Processed image data, stored the collected color RGB image in the synchronous dynamic random access memory SDRAM, implemented algorithms to transfer RGB to Ycbcr, formed binary images through threshold segmentation on gray images
- Located the positions of numbers in pictures and videos by boundary tracking algorithm
- Recognized numbers with recognition algorithms based on geometric features

Face Recognition Based on Multi-task Learning   09/2019 - 11/2020

Advisor: Lecturer Yinfei Xu (Southeast University)
- Learned deep learning fundamentals and took online public course from Stanford
- Read the paper *RetinaFace: Single-stage Dense Face Localisation in the Wild*
- Reproduced, trained, tested, and evaluated the retinaface architecture

Design of Automated Package Locker   09/2019 - 10/2020

Advisor: Lecturer Liang Wang (Southeast University)
- Aimed to design a package locker that can be automatically loaded and to help reduce courier costs
- Designed the scanner control module to identify the two-dimensional code on the packages and transferred the data to storage, used UART (Universal Asynchronous Receiver\Transmitter) protocol and FPGA to read the courier number, transmitted the number to FPGA in ASCII coding with a baud rate of 9600 and first-in-first-out (FIFO) principle
- Built Wifi information transceiver module, used the MQTT (Message Queuing Telemetry Transport) instant communication protocol proposed by IBM, selected ESP32 from Espressif as the external WIFI transceiver module
- Assisted in debugging step motor module, used stepper motor to transfer packages and control the switch of the locker, reduced controlling and programming errors by adopting common cathode

Video Encoding Based on Machine Learning   07/2020 - 08/2020

Summer Research Program at University of Florida, Advisor: Prof. Dapeng Oliver Wu
- Attempted to create a new compression algorithm through machine learning to optimize video encoding and reduce video artifacts

- Read papers on video coding, summarized the artifacts that may appear in video coding and analyzed the causes, studied papers on machine learning and video coding combination
- Proposed a multi-frame inloop filter with deep Kalman network as a back-end video restoration to improve video quality based on literature

Implementation of a Version-control System Gitlet   11/2019 - 12/2019

Advisor: Teaching Prof. Paul Hilfinger (University of California, Berkeley)

- Established a version-control system called Gilet and mimicked some of the basic features of Git, realized the functions including saving the contents of entire directories of files, restoring a version of one or more files or entire commits, viewing the history of your backups, maintaining related sequences of commits, and merging changes made in one branch into another
- Divided tasks into three parts including working directory, stage, and commit history
- Used two ArrayList to record the file name of the files that needs add and remove, generated the mapping with two Hashmap, added files to the repository after using hashmap to record filename and blobname (blob was a hashcode generated to save files that need to be stored
- Implemented commit history with Tree, used hashcode to compare the content of different files

Establishment of a CPU (risc-v architecture) With Logic Gate   10/2019 - 11/2019

Leader, Advisor: Teaching Prof. Dan Garcia & Prof. Miki Lustig (University of California, Berkeley)

- Built a risc-v architecture cpu through logisim-evolution built-in blocks, implemented functions of the cpu by five parts including instruction fetch, instruction decode, execute, memory, and writeback
- Distinguished the different types of risc-v instructions based on the opcode, used func3 to judge the specific function, generated different function control signals according to the decode instruction
- Selected appropriate signals, implemented ALU logic, read and wrote signals in register
- Developed register file, immediate generator, branch comparator and relevant data path to support execution

ACTIVITIES

Young Volunteers Association of Southeast University   10/2017 - 03/2019

Member, Activity Organizer

- Provided training and volunteer arrangements for registered volunteers in the association
- Organized the volunteer activity of 'Nanshufang', which had more than 400 participants
- Participated actively in various voluntary activities for more than 50hours per semester
- Arranged the Memorial Party of the association

HONORS & AWARDS

- Excellent performance for Academic Courses (three times)   2018 - 2019
- Second Prize of Mathematical Contest in Modeling   06/2019
- Third Prize of 'Robcup' Robot Competition   12/2018
- Outstanding Volunteer   12/2018

SKILLS

- **Computer:** C++ (Proficient), JAVA (Proficient), Verilog (Proficient), Risc-v (Proficient), Hspice, Matlab, Python, C, SPSS
- **Hobby:** Basketball