Zimu Guan

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Education

Zhejiang University - University of Illinois at Urbana-Champaign Institute Sept. 2018 – Present
Undergraduate of Electronic and Computer Engineering (ECE)

- **GPA**: 3.97/4.0

Honors & Awards

Undergraduate Sept. 2018 – Present
Zhejiang University - University of Illinois at Urbana-Champaign Institute

- Third-class scholarship of Zhejiang University 2019
- Second-class scholarship of ZJUI Institute & Deans' List 2019
- GPA rank: 5/51 2019
- Third-class scholarship of Zhejiang University 2020
- Third-class scholarship of ZJUI Institute & Deans' List 2020
- GPA rank: 14/51 2020

Research & Work Experience

Geometry Processing and Physically Based Simulation Apr. 2021 – Present
RESEARCH *State Key Lab of CAD & CG, Zhejiang University*

- Advised by Prof. Jin Huang. Have done some related work on mesh simplification and refinement. Currently looking for further area to explore.

Teaching Assistant for Calculus III (MATH 241) Sept. 2020 – Jan. 2021
ZJUI Institute

- Hold discussion sessions every week and taught difficult concepts covered in course including lebesgue integral, manifold, differential forms, etc. for engineering students. These sessions are famous among students, attracting other sessions' students to join in.

Virtual Reality in Robot Assisted Surgical Training Jun. 2019 – Aug. 2019
SUMMER RESEARCH *ZJUI Institute*

- Advised by Prof. Liangjing Yang. Based on the robot assisted surgical, explore precise way on virtual reality training, camera calibration and 3D reconstruction.

Projects

TLEOS(Unix based Operating System) | *C/ASM* Apr. 2021

- *Course Project for ECE 391 Computer Systems Engineering*
- LINK: https://github.com/TaKeTube/TLEOS
- Developed a Linux-like operating system kernel that supports almost all basic functionalities of a modern OS, including interrupt, system call, virtual memory, scheduling and a read-only file-system.
- Supported a range of devices such as keyboard, mouse, sound card, serial port, RTC, PIT, network card and VGA.
- Developed some basic graphics functionality including high-resolution image display.
- Supported music playing.

FPGA-Based 3D Graphics Renderer | *SystemVerilog* Dec. 2020

- *Final Project for ECE 385 Digital System Laboratory*
- LINK: https://github.com/TaKeTube/FPGA-based-3D-graphics-renderer
- Designed and implemented a basic graphics pipeline on FPGA that renders 3D objects through model, view, projection transformation and Rasterization, including all control & data flow.
- Achieved real-time rendering and interactive interface with the position of the camera and the rotation of the object in control.

- Supported viewport clipping and .obj model file loading.

Index Structure Database with Stack-based Query Processing | *Python3* May. 2020

- *Computing Assignment for CS225 Data Structure*
- LINK: https://github.com/TaKeTube/2SAM-Database
- Implemented a list-of-block structure as bottom layer that simulates real memory
- Built B+-tree and B-tree for both primary keys and secondary keys indexing
- Designed and implemented a two-stack abstract machine to process queries semantically

Activities Experience

Design Event Posters Sept. 2019 – Aug. 2020

Creative Design Department Member *New Media Center, International Campus, Zhejiang University*

- Core member of creative design department. Always gave the overall framework of the poster design. Posters are used in graduation ceremony, activity propoganda, etc.

Aid Education in Remote Mountains of China Aug. 2019

Volunteer Teacher *Jiaoma Center School, Jiaoma, Qiannan, Guizhou, China*

- 2 weeks volunteer teaching in the local primary school. Taught arts & English and loved by students. Visited students' family deep in the mountains and local government staffs to investigate local education and poverty relief condition.

Skills & Interests

Skills: C/C++, Python3, x86-asm, MATLAB, SystemVerilog(FPGA), CMake, LaTex, Git, Markdown, Linux Shell
Language: Chinese(native), English(TOEFL score 103 with R29, L29, W24, S21)

Have great interests in **math**. Self-Learn math persistently and have some basic knowledge on advanced topic such as functional analysis, differential geometry and abstract algebra.
Have interests in **computer graphics**, especially in physically based simulation. Self-learnt online course GAMES101 - Introduction to Computer Graphics (lectured by prof. Lingqi Yan in UCSB) and other relevant materials.
Have interests in **high performance computing**.

Relevant Courses

Computer Science & Engineering Relevant

ECE 391 **Computer Systems Engineering**
ECE 385 **Digital Systems Laboratory**
ECE 365 **Data Science And Engineering** (Machine Learning, Genomics, NLP)
CS 374 **Intro to Algorithm & Model of Computation**
CS 225 **Data Structures**
ECE 220 **Computer Systems & Programming**
ECE 120 **Introduction to Computing**

Signal Processing Relevant

ECE 417 **Multimedia Signal Processing**
ECE 310 **Digital Signal Processing**
ECE 210 **Analog Signal Processing**

Physics Relevant

ECE 329 **Fields and Waves I**
PHYS 214 **University Physics: Quantum Physics**
PHYS 213 **University Physics: Thermal Physics**
PHYS 212 **University Physics: Elec & Mag**
PHYS 211 **University Physics: Mechanics**

Math Relevant

MATH 286 **Intro to Differential Eq Plus** (covering some advanced contents related to functional analysis)
MATH 442 **Introduction to Partial Differential Equations** (currently taking)
MATH 241 **Calculus III** (covering linear algebra and some advanced contents related to analysis and differential geometry)
MATH 213 **Discrete Math**
ECE 313 & 314 **Probability with Engineering Application**
MATH 221 & 231 **Calculus I & II**