Allen Zeng

Electrical Engineering and Computer Science, B.S.
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Education

University of California, Berkeley (GPA: 3.459)   August 2014 – December 2017

Degree: Bachelor of Science in Electrical Engineering and Computer Science

Coursework:

- Image Processing and Computational Photography
- Computer Graphics and Imaging
- Designing Information Devices and Systems
- Signal Processing and Control Systems
- FPGA Lab and Digital Design
- Computer Architecture
- Probability and Random Processes
- Machine Learning
- Artificial Intelligence
- Convex Optimization
- Efficient Algorithms and Intractable Problems
- Data Structures
- Databases
- Discrete Mathematics and Probability Theory

Skills

Technical:

- Proficient in Python, MATLAB, C, C++, Java, MIPS, RISC-V, Verilog, and SQL
- Experience with JavaScript, HTML, and CSS in developing graphical user interfaces
- Interface with computer vision library OpenCV and machine learning library TensorFlow
- Data visualization through MATLAB, Microsoft Excel, and Matplotlib
- Software debugging and comprehensive unit testing; automated testing through Unix Bash shell scripting
- Writing technical documentation with LaTeX

Leadership:

- Comfortable giving presentations in both lecture and one-on-one settings
- Patient and experienced with tutoring peers, presenting core concepts through relevant examples
- Takes initiative on working quickly to implement features and resolve bugs in team projects

Work Experience

Software Engineering Intern – Northrop Grumman Corporation   May 2017 – August 2017

- Full stack software system integration and testing on the Airborne Signal Intelligence Payload
- Developed test methods and scripts, shortening software integration timeline to hours, instead of days
- Created a GUI test tool to send JSON command messages, and verify correct software communication within the system
- Wrote new and updated preexisting Apache Ant XML build scripts for system tools
- Augmented product to handle variable size communications, reducing messages' sizes from fixed 64kB packets down to approximately 1kB packets

Assistant Instructor, Reader, & Tutor - University of California, Berkeley   January 2016 – December 2016

- Taught lab sections for CS61C: Computer Architecture; Tutor for EE16A: Designing Information Devices and Systems; Reader for CS70: Discrete Mathematics and Probability Theory

Notable Projects

RISC-V Processor **–** Three-stage pipelined RISC-V CPU with memory-mapped IO, running at 50 MHz and implemented on the Xilinx ML505 platform. Can load and run a "piano program": accept keyboard inputs, play superimposed sinusoidal audio waves, and display visualizations to a monitor

- UART interface for loading program instructions and data, and for accepting digital user inputs
- Asynchronous button and rotary parsing, for accepting physical user inputs into running programs
- Generates analog tones to an on-board piezoelectric speaker and generates digital data to a stereo audio codec
- Outputs graphical frames with a resolution of 1024x768 at 60 Hz

Path Tracer - A physics-based parallelized ray tracing program which simulates realistic lighting of 3D scenes

- Monte Carlo sampling of BSDFs combine direct and indirect illumination methods to simulate materials: mirror, metal, and glass surfaces
- Modeled lens system replicates camera effects such as defocus blur, wide angle and fisheye shots, and cell-based autofocusing through gradient descent

Mesh - Team project implementing the Ball-Pivoting Algorithm to reconstruct surface polygon meshes from 3D point clouds

- Designed a voxel-grid data structure to retrieve nearest neighbor points during reconstruction
- Debugged the project through unit testing and generating small input point clouds
- Programmed features such as polygon splitting, mesh upsampling, and 3D texture and environment mapping