Allen Zeng

Electrical Engineering and Computer Science, Student
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Education

University of California, Berkeley – **EECS** *August 2014 – May 2018*

- Electrical Engineering and Computer Science
- GPA: 3.285

Current Studies

- Control theory and artificial intelligence, with application towards autonomous vehicles
- Discrete mathematics and probability theory
- Information devices and systems
- Computer graphics and imaging

Projects Implemented

- ***Sixteen*** – Robotic vehicle that drives according to voice commands. Speech recognition is done through the K-means clustering of data via principal component analysis
- ***PathTracer*** – A physics-based parallelized ray tracing program which simulates realistic lighting of 3D scenes. Direct and indirect illumination methods are employed along with bidirectional scattering distribution function sampling to simulate materials: mirror, metal, and glass surfaces. Additionally, a lens system replicates camera effects such as defocus blur, wide angle and fisheye shots, and cell-based autofocusing
- ***MeshEditor*** - Models polygon meshes through the use of the HalfEdge data structure and implements features such as polygon splitting, mesh upsampling, and 3D texture and environment mapping
- ***Rasterizer*** – Rasterizes lines and triangles to screen, and maps texture to 2D surfaces. Rendered objects are anti-aliased through supersampling, bilinear filtering, and trilinear filtering
- ***WordNet*** – Uses Google's Ngram dataset to create a graph of hypernyms and hyponyms, and to construct a plot of relative word frequencies over time to visualize language growth through history
- ***Gitlet*** - Reproduction of the version control system Git with basic commands, including 'branch,' 'merge,' and 'rebase'
- ***WordTries*** – Structures a trie and a ternary search tree to hold a dictionary of words and their weights, in order to execute an autocomplete operation based on user input
- ***MIPS Assembler and Linker*** – An assembler and linker for MIPS, allowing for standard instructions and pseudoinstructions
- ***MIPS Processor*** – A 32-bit, two-cycle pipelined processor for MIPS designed through Logisim

Technical Skills

- Fluency in C, C++, Java, Python, MIPS
- Understanding of GLSL, HTML, CSS, Scheme, SQL, JavaScript
- Proficiency with logic circuit and hardware architecture design, via Logisim and MARS IDE
- Experience with CAD programs DipTrace and SolidWorks
- Comfortable writing technical documentation with LaTeX

Notable Experience

University of California, Berkeley – **EE16A Reader/Tutor** *January 2015 – Present*

- Currently a reader and tutor for the EE16A, "Designing Information Devices and Systems I"
- Responsibilities include grading homework, grading exams, and providing students with general and specific feedback based on their answers
- Students are notified about errors and are given advice on how to understand difficult concepts

CalSol, UC Berkeley Solar Vehicle Team – **Member** *September 2015 – Present*

- Developing a mechanical sensor network consisting of accelerometers, strain gauges, rotational position sensors, and temperature sensors for integration into the car, using the SPI and I^2C protocols
- Designed a quad flat package (QFP) to dual in-line package (DIP) breakout board, compatible with 16 to 80 pin QFP and QFN with 0.40 mm, 0.50 mm, and 0.65 mm pitches.

University of California, Berkeley – **Tutor** *August 2014 – December 2015*

- Continuing group and individual tutoring of various STEM topics, primarily computer science and math, to younger peers from Bakersfield on a weekly basis. Teaching done through phone and video calling