Zhengfei Kuang
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Education

- **Tsinghua University** *08/2015 - 06/2019*
  Bachelor of Computer Science & Technology
  - **Overall GPA**: 3.79/4.0
  - **Mathematics Curriculum**: Linear Algebra(4.0); Numerical Analysis(4.0); Elementary Number Theory(4.0); Stochastic Mathematical Methods(4.0); Discrete Mathematics(4.0).
  - **Computer Science Curriculums**: Fundamental Programming(4.0); Data Structures(4.0); Computer Graphics(4.0); Artificial Intelligence(4.0); Computer Networks(4.0); Operating System(4.0); Digital Image Processing(4.0); Computer Architecture(4.0)
- **University of Southern California** *08/2019 - now*
  Ph.D. Student of Computer Science Department
  - **Overall GPA**: 4.0/4.0
  - **Curriculums**: Advanced Analysis of Algorighms(4.0);Computer Animation and Simulation(4.0);Augmented, Virtual and Mixed Reality(4.0); Representation Learning: Theory and Practice(4.0).

Positions

- **University of Southern California** *08/2020 - now*
  Research Assistant, USC Institute for Creative Technologies
- **SRI International** *6/2020 - 9/2020*
  Research Intern, Center for Vision Technologies
- **Tsinghua University** *8/2017 - 6/2019*
  Research Assistant, Computer Science Department

Teaching

- **University of Southern California** *08/2020 - now*
  Teaching Assistant of Course CSCI 570: Analysis of Algorithms

Selected Course Projects

- **A GPU Path-Tracing Renderer Based on Nvidia OptiX** *2/2019 - 5/2019*
  Group Leader, Supervised by Associate Prof. Kang Chen
  - Designed and implemented a rendering pipeline that can render pixels in parallel with the support of OptiX.
  - Designed and implemented a simplified version of the VRay Material supporting most basic functions, e.g. BRDF, BSDF, and Double-side.
- **An Ocean Simulator & Physics Engine with Distributed Computing** *7/2018 - 8/2018*
  Group Leader, Supervised by Associate Prof. Kang Chen
  - Analyzed an ocean simulating method based on Fast Fourier Tranforsmation
  - Designed a physics engine with multiple objects involving buoyancy and collisions
  - Implemented the algorithms mentioned above using the MapReduce framework
- **A Low-Level OS Kernel Fuzzing Tool Based on Syzkaller and kAFL** *4/2018 - 7/2018*
  Group Leader, Supervised by Associate Prof. Yu Chen
  - Designed and Implemented a low-lever kernel fuzzing tool based on Syzkaller and kAFL
  - Found several elusive bugs in a teaching operating system called Ucore using the tool.
- **A 32-bit MIPS CPU based on FPGA** *10/2017 - 12/2017*
  Group Leader, Supervised by Prof. Weidong Liu
  - Implemented a CPU using Verilog that supports 50+ MIPS instructions and several extensions (TLB, Uart communication), which is capable of running the operating system Ucore

- **A 3D Shadder based on Ray Tracing, Photon Mapping and Bezier Curves** *05/2017 - 06/2017*
  Individual project, Supervised by Prof. Shimin Hu
  - Implemented the Ray Tracing algorithm and Photon Mapping using C++ and OpenCV library
  - Rendered various models constructed by the Bezier Surface

Publications

- **Dynamic Facial Asset and Rig Generation from a Single Scan**
  Jiaman Li, Zhengfei Kuang*, Yajie Zhao, Mingming He, Karl Bladin, Hao Li*
  - ACM SIGGRAPH Asia 2020. Supervised by Prof. Hao Li, USC
  - Developed an automatic pipeline based on neural models that can generate a high-quality facial asset with multiple expressions and textures given a single scan as input.
- **Probabilistic Projective Association and Semantic Guided Relocalization for Dense Reconstruction**
  Sheng Yang, Zheng-Fei Kuang, Yan-Pei Cao, Yu-Kun Lai, Shi-Min Hu
  - ICRA 2019. Supervised by Prof. Shimin Hu, Tsinghua University
  - Co-designed an ICP algorithm based on probabilistic association method with projective features(RGB-D, semantic)
  - Implemented our algorithm and several tools for data generation; did most of the experiments demonstrated in the ICRA submission draft
- **Learning to Reconstruct High-quality 3D Shapes with Cascaded Fully Convolutional Networks**
  Yan-Pei Cao, Zheng-Ning Liu*, Zheng-Fei Kuang, Leif Kobbelt, Shi-Min Hu*
  - ECCV 2018. Supervised by Prof. Shimin Hu, Tsinghua University
  - Participated in developing an OctNet-based volumetric reconstruction module which can improve the quality of TSDF data by processing its features
  - Fine-tuned and tested an algorithm named 3D-EPN on our dataset as one of the baselines

Awards

- Annenberg Fellowship in 2019 8/2019
- Guang-Yao Scholarship in 2018 (top 10%) 10/2018
- Zhang Weiming Scholarship in 2017 (top 10%) 10/2017
- Yixin Scholarship in 2016 (top 10%) 10/2016
- Gold prize in ACM-ICPC 2013 China Provincial Programming Contest 10/2016
- Gold prize in 2013 China National Olympiad in Informatics 7/2013

Extracurricular Activities

- Leader of Video & Graphic Design Group in the Department of CS 07/2018 - present
- Member of the Chorus in Tsinghua University 07/2017 - present
- Volunteer of the 2017 sports meeting in Tsinghua University 05/2017
- Member of the Student Union in the Department of CS 09/2016 - 06/2017
- Member of the Astronomy Society in Tsinghua University 09/2016 - 06/2017

Skills

- **Programming Skills**: C, C++, Python, Java, CUDA, Shader, MATLAB, JavaScript(Limited) and Lua(limited).
- **Operating Systems**: Linux and Windows.
- **Tools**: PyTorch, Tensorflow, GNU toolchain, Adobe After Effect, Adobe Premiere, Adobe Photoshop, Blender, Unity, Maya, UE4.