JUNHAO WANG

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EDUCATION

University of Southern California (USC), Los Angeles, CA — Aug. 2019 ~ May. 2021 (Expected)
M.S. in Computer Science — *GPA: 3.85 / 4.0*

Israel Institute of Technology (Technion), Israel — Jul. 2017 ~ Aug. 2017
Summer Program of Machine Learning (awarded scholarship of half tuition) — *Top 15%*

Shantou University, China — Sep. 2014 ~ Jun. 2018
B.E. in Computer Science and Technology (first-class scholarship twice) — *GPA: 3.74 / 4.0, Top 2%*

SKILLS

Programming Languages	C/C++, GLSL, HLSL, Java, C#, Python, Scala, Objective-C, MATLAB
Writing & Problem Solving	LeetCode Book [Website]
Development Tools & Libraries	CLion, VSCode, OpenGL, Unity, Emacs, IntelliJ, PyCharm, Xcode, Git
Relevant Courses	Computer Graphics, 3D Graphics and Rendering, Linear Algebra, Data Structures

EXPERIENCES

Software Engineer (Intern), Alexa Speech, Amazon — Jun. 2020 ~ Aug. 2020

- Initiated and developed a Spark aggregator that reduces model rebuild cost and time on Alexa NLP static models.
- Deployed systems on EMR clusters via CloudFormation and released products on pipelines with unit and integration tests.
- Wrote drafts and documents (more than 20,000 words), worked with 2 external teams, and hosted 6 discussion meetings.
- Delivered high-quality work on time with 12 code reviews and excellent final presentation.

PROJECTS

Plan Odyssey: 3D Exploration Unity Game (C#, HLSL Shader) [Website][Demo] — Jan. 2021 ~ May. 2021

- Grouped with two students on a Sci-Fi exploration game where players play as astronauts to explore outland planets.
- Implemented smooth player control, Cinemachine cameras, walk/jump animations, jetpack system with particle effect.
- Practiced HLSL shaders under Universal Render Pipeline and made topographic scanner and volumetric light cone effect.
- Learned compute shader techniques and achieved beautiful large-scale grass without noticeable FPS drop. [My Blog Post]
- Designed seamless terrains with PolyBrush and wrote planet controller script to manage day/night cycle and sunrise/sunset.

ForkerRenderer: CPU-Based Software Rasterizer (C++) [GitHub][Result 1][Result 2] — Dec. 2020 ~ Jan. 2021

- Implemented CPU-based software rasterization that mimics OpenGL behavior without any third-party libraries.
- Supports parsing *.obj model and *.mtl material files with auto triangulation and position vertex normalization.
- Developed Blinn-Phong shading with diffuse/specular mapping and normal mapping with TBN matrix transformation.
- Included perspective and orthographic projections in camera model and implemented Perspective-Correct Interpolation.
- Achieved soft shadow mapping with Percentage-Closer Filtering (PCF).

Campus App: Connect Everyone at STU (Objective-C) [Website][App Store] — Oct. 2015 ~ Aug. 2017
Team Leader of 3 Members, Co-Founder, iOS Developer, UI Designer

- Invented the project *Campus App* to help students and faculties put school information and resources at their fingertips.
- Developed an *iOS* app in 2 months and released 14 versions on *App Store* with a 4.7/5.0 rating and 10,000+ users.
- Conducted surveys on requirement analysis and built 15+ features such as course schedule customization, mobile library, etc.
- Ranked 7th out of 300+ apps in the *First China iOS App Development Competition* in 2017.

Save Mr. Marx App: Social Science Test Preparation (Objective-C) [Website][App Store] — Nov. 2016 ~ May. 2017
Team Leader of 5 Members, Co-Founder, iOS Developer, UI Designer

- Extended the final project in *Software Engineering* course to help students learn and enjoy social science knowledge.
- Created an *iOS* app in 1 month and released 4 versions on *App Store* with a 4.6/5.0 rating and 4,500+ users.
- Implemented a backend system on a small-scale cloud platform *Bmob* to store user information and question set data.
- Ranked 5th out of 300+ apps in the *First China iOS App Development Competition* in 2017.

Design of Key Frame Extraction from News Videos (Python, MATLAB) — Mar. 2018 ~ Jul. 2018

- Researched into methods of key frame extraction, shot boundary detection, and story separation for daily news videos.
- Implemented, compared, and evaluated shot boundary detection algorithms (*Histogram Difference*, *Edge Change Ratio*).
- Awarded *Outstanding Undergraduate Graduation Thesis* in 2018.