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, CMake, Git
Relevant Courses Computer Graphics, 3D Graphics and Rendering, Linear Algebra, Data Structures

EXPERIENCES

Software Engineer (Intern), Alexa Speech Recognition, 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, 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

- Collaborated 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 enabled planet controller script to manage day/night cycle and sunrise/sunset.

ForkerRenderer: CPU-Based Software Rasterizer (C++, CMake) [GitHub][Gallery][Shadow Result] — Dec. 2020 ~ Jan. 2021

- Implemented CPU-based software rasterization that mimics OpenGL behavior without any third-party libraries.
- Developed a parser for *.obj model and *.mtl material files with auto triangulation, vertex normalization, and tangent generation.
- Achieved Blinn-Phong shading and texture mapping with various wrapping and filtering modes (Nearest, Bilinear).
- Included perspective and orthographic projections in camera model and achieved Perspective-Correct Interpolation.
- Enabled soft shadow effect in shadow pass using PCF-based Percentage-Closer Soft Shadow (PCSS) algorithm.

Campus App: Connect Everyone at STU (Objective-C, Python) [Website][App Store] — Oct. 2015 ~ Aug. 2017

Team Leader of 3 Members, Co-Founder, iOS Developer, UI Designer

- Initiated the project *Campus App* to help students and faculties put school information and resources at their fingertips.
- Created an *iOS* app in two 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 one 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.