

# JUNHAO WANG

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## EDUCATION

<b>University of Southern California (USC)</b> , Los Angeles, CA	Aug. 2019 ~ May. 2021 (Expected)
M.S. in Computer Science	<b>GPA: 3.85 / 4.0</b>
<b>Israel Institute of Technology (Technion)</b> , Israel	Jul. 2017 ~ Aug. 2017
Summer Program of Machine Learning (awarded scholarship of half tuition)	<b>Top 15%</b>
<b>Shantou University</b> , China	Sep. 2014 ~ Jun. 2018
B.E. in Computer Science and Technology (first-class scholarship twice)	<b>GPA: 3.74 / 4.0, Top 2%</b>

## SKILLS

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

## EXPERIENCES

<b>Software Engineer (Intern), Alexa Speech Recognition, Amazon</b>	Jun. 2020 ~ Aug. 2020
<ul style="list-style-type: none"><li>Initiated and developed a Spark aggregator that reduces model rebuild cost and time on Alexa NLP static models.</li><li>Deployed systems on EMR clusters via CloudFormation and released products on pipelines with unit and integration tests.</li><li>Wrote drafts and documents, worked with <b>2</b> external teams, and hosted <b>6</b> discussion meetings.</li><li>Delivered high-quality work on time with <b>12</b> code reviews and excellent final presentation.</li></ul>	

## PROJECTS

<b>Plan Odyssey: 3D Exploration Unity Game</b> (C#, HLSL Shader) [Game Trailer] [Gameplay Demo]	Jan. 2021 ~ Apr. 2021
<ul style="list-style-type: none"><li>Collaborated with two students on a Sci-Fi exploration game where players play as astronauts to explore outland planets.</li><li>Implemented smooth player control, Cinemachine cameras, walk/jump animations, jetpack system with particle effect.</li><li>Practiced HLSL shaders under Universal Render Pipeline and made topographic scanner and volumetric light cone effect.</li><li>Learned compute shader techniques and achieved beautiful large-scale grass without noticeable FPS drop. [My Blog Post]</li><li>Designed a beautiful planet with PolyBrush and enabled planet controller script to manage day/night cycle and sunrise/sunset.</li></ul>	
<b>ForkerRenderer: CPU-Based Software Rasterizer</b> (C++, CMake) [GitHub] [Gallery] [Shadow Result]	Dec. 2020 ~ Jan. 2021
<ul style="list-style-type: none"><li>Implemented CPU-based software rasterization that mimics OpenGL behavior without any third-party libraries.</li><li>Developed a parser for *.obj model and *.mtl material files with auto triangulation, vertex normalization, and tangent generation.</li><li>Achieved Blinn-Phong shading and texture mapping with various wrapping and filtering modes (Nearest, Bilinear).</li><li>Included perspective and orthographic projections in camera model and achieved Perspective-Correct Interpolation.</li><li>Enabled soft shadow effect in shadow pass using PCF-based Percentage-Closer Soft Shadow (PCSS) algorithm.</li></ul>	
<b>Campus App: Connect Everyone at STU</b> (Objective-C, Python) [Website] [App Store]	Oct. 2015 ~ Aug. 2017
<i>Team Leader of 3 Members, Co-Founder, iOS Developer, UI Designer</i> <ul style="list-style-type: none"><li>Initiated the project <i>Campus App</i> to help students and faculties put school information and resources at their fingertips.</li><li>Created an <i>iOS</i> app in two months and released <b>14</b> versions on <i>App Store</i> with a <b>4.7/5.0</b> rating and <b>10,000+</b> users.</li><li>Conducted surveys on requirement analysis and built <b>15+</b> features such as course schedule customization, mobile library, etc.</li><li>Ranked <b>7<sup>th</sup></b> out of <b>300+</b> apps in the <i>First China iOS App Development Competition</i> in 2017.</li></ul>	
<b>Save Mr. Marx App: Social Science Test Preparation</b> (Objective-C) [Website] [App Store]	Nov. 2016 ~ May. 2017
<i>Team Leader of 5 Members, Co-Founder, iOS Developer, UI Designer</i> <ul style="list-style-type: none"><li>Extended the final project in <i>Software Engineering</i> course to help students learn and enjoy social science knowledge.</li><li>Created an <i>iOS</i> app in one month and released <b>4</b> versions on <i>App Store</i> with a <b>4.6/5.0</b> rating and <b>4,500+</b> users.</li><li>Implemented a backend system on a small-scale cloud platform <i>Bmob</i> to store user information and question set data.</li><li>Ranked <b>5<sup>th</sup></b> out of <b>300+</b> apps in the <i>First China iOS App Development Competition</i> in 2017.</li></ul>	
<b>Design of Key Frame Extraction from News Videos</b> (Python, MATLAB)	Mar. 2018 ~ Jul. 2018
<ul style="list-style-type: none"><li>Researched into methods of key frame extraction, shot boundary detection, and story separation for daily news videos.</li><li>Implemented, compared, and evaluated shot boundary detection algorithms (<i>Histogram Difference</i>, <i>Edge Change Ratio</i>).</li><li>Awarded <i>Outstanding Undergraduate Graduation Thesis</i> in 2018.</li></ul>	