

# Daqi Lin

GRADUATE STUDENT · COMPUTER GRAPHICS PROGRAMMER

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## Education

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### Master of Science in Computer Science (Expected May 2019)

THE UNIVERSITY OF UTAH

- Graphics and visualization track. Research area: GPU algorithms, high performance ray tracing.

*Salt Lake City, USA*

*Aug. 2017 -*

### Bachelor of Computing (Honors with Highest Distinction)

NATIONAL UNIVERSITY OF SINGAPORE

- Computer Science Program, School of Computing (Specialization: Visual Computing)

*Singapore*

*Aug. 2013 - Jun. 2017*

## Experience

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### Software Engineering Intern

MATHWORKS INC.

- Participated in the design and development of new functions in MATLAB's virtual globe system. Redesigned and implemented new APIs to integrate the new functions with the code base.
- Contributed to multiple components to improve the usability and speed of the current 3D workflow in MATLAB.
- Researched and developed fast terrain mapping techniques to embed 3D objects in terrain.

*Natick, USA*

*May. 2018 - Aug. 2018*

### Teaching Assistant

SCHOOL OF COMPUTING, UNIVERSITY OF UTAH

- Teaching assistant of CS6610 - Interactive Computer Graphics - a graduate course in rasterization graphics.

*Salt Lake City, USA*

*Jan. 2018 - Apr. 2018*

### Research Assistant

REALISTIC COMPUTER GRAPHICS GROUP, UNIVERSITY OF UTAH

- Working on an interactive GI project based on many-light techniques under the supervision of Dr. Cem Yuksel.
- Developing a new acceleration structure for fast and memory efficient CPU ray tracing.

*Salt Lake City, USA*

*Sep. 2017 -*

### Research Assistant

GRAPHICS LAB, XIAMEN UNIVERSITY

- Helped to boost the performance of a 3D printing optimization algorithm developed by the group - by adapting the algorithm for multiple processors and applying computational optimizations, making it 6x faster.

*Xiamen, China*

*Jun. 2017*

### Undergraduate Student Researcher

NATIONAL UNIVERSITY OF SINGAPORE

- Developed a highly efficient GPU path tracer which is 30% faster than NVIDIA's Optix engine (using the Cornell Box benchmark) while working towards the final year project under the supervision of Dr. Kok-Lim Low. The GPU path tracer supports a variety of functions including bi-directional ray tracing and metropolis light transport.
- Maximized SIMD efficiency of the GPU path tracer by thread compaction. Terminated threads were discarded from the warp and remaining threads were re-grouped by the kernel type of the lighting computation.
- Exploited CUDA framework to implement new algorithms for fast parallel kd-tree construction on GPU, which yielded 5x faster speed than traditional CPU kd-tree construction on high-end graphics cards.

*Singapore*

*May. 2016 - May. 2017*

### Graphics R&D Intern

HONG WEI GLOBAL

- Developed a light-weight physically based rendering tool for game development on OpenGL-ES2, which was used for 3D training simulation systems of government agencies including the Singapore Civil Defence Force.
- Solved a lighting quality problem by redesigning the arrangement of prefiltered cube-environmental mipmaps.
- Invented an approximation method for subsurface scattering for fast skin rendering with limited resources.
- Extended functionality of Godot - an open source game engine, including subsurface scattering and depth of field. Collaborated with other software engineering team members to make the game engine more efficient.

*Singapore*

*May. 2015 - Nov. 2015*

## Web Programmer

NEXTGEN TECHNOLOGY (STARTUP IN NUS)

Singapore

Sep. 2014 - Nov. 2014

- Responsible for Google Map integration in a web-based mobile application for local restaurant recommendation. Customized the map to show markers and information of the recommended restaurants.

## Specialized Skills

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- Strong mathematics and computer science background
- Extensive knowledge in graphics techniques in ray tracing and rasterization
- Working knowledge of computer vision and image processing
- Experience in writing shaders to achieve complex visual effects
- Experience in most recent rendering techniques (e.g. tiled deferred rendering)
- Experience in developing parallel GPU versions for existing CPU algorithms
- Experience in deep learning (CNN) with TensorFlow for image recognition
- Experience in solving numerical optimization problem with MATLAB/SciPy
- Programming languages: C++, Java, Python, JavaScript
- Web development: HTML/CSS/JavaScript, PHP, MySQL and WebGL
- GUI development: WIN32 API, Qt (with C++ and QML), Java Swing
- Graphics and GPU Programming: CUDA, OpenGL 4, Vulkan, Direct3D 11
- 3D modeling & rigging & game engine: Autodesk Maya, Blender Game Engine
- Multimedia Editing: Adobe Premiere, Photoshop, Flash, Audition
- Music mixing & recording & arrangement : Ableton Live, Fruity Loops

## Leadership & Service

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### Sound Engineer

GEYAO(BALLAD) MUSIC INTEREST GROUP, NUS CHINESE SOCIETY

Singapore

Aug. 2013 - Apr. 2017

- Responsible for recording, mixing, and music arrangement

## Honors & Awards

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|------|--|--|------------------------|
| 2018 | <b>Best Project Award</b>  | University of Utah Scientific Visualization Course<br>( <a href="https://n8vm.github.io/BSDF-Visualizer/">https://n8vm.github.io/BSDF-Visualizer/</a> )  | Salt Lake City,<br>USA |
|      |  | <ul style="list-style-type: none"><li>• Web-Based Visualization of Bidirectional Reflectance Distribution Functions (BRDFs)</li></ul>  |                        |
| 2017 | <b>Juror &amp; Student Choice Awards</b><br><b>Best In Class Award</b> | University of Utah Teapot Rendering Competition<br>( <a href="http://graphics.cs.utah.edu/trc/">http://graphics.cs.utah.edu/trc/</a> )   | Salt Lake City,<br>USA |
|      |  | <ul style="list-style-type: none"><li>• Created a ray tracing method to produce crescent-shaped shadows of tree leaves under solar eclipse.</li></ul>  |                        |
| 2016 | <b>Best Project In Class</b>   | CS4243 Computer Vision, Sem 1, Year 16/17, School of Computing, NUS  | Singapore              |
|      |  | <ul style="list-style-type: none"><li>• Obtained the most accurate result in tracking the motion of players and the ball from a beach volleyball video.</li></ul>  |                        |
| 2015 | <b>Dean's List Award</b>   | Semester 2, Year 14/15, School of Computing, NUS   | Singapore              |
|      |  | <ul style="list-style-type: none"><li>• Awarded only to top 5% students in the cohort.</li></ul>   |                        |
| 2013 | <b>Silver Prize</b>  | Orbital Program, held by School of Computing, NUS  | Singapore              |
|      |  | <ul style="list-style-type: none"><li>• Developed an Online Karaoke platform which can perform real-time pitch shifting and human voice removal, using a Flash applet (karagodktv.appspot.com)</li></ul> |                        |