

# Daqi Lin

COMPUTER GRAPHICS RESEARCHER

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## Education

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### PhD in Computing

THE UNIVERSITY OF UTAH

- Member of Realistic Computer Graphics Group led by Dr. Cem Yuksel
- Thesis: High-Quality Sampling for Complex Effects in Real-Time Ray Tracing

*Salt Lake City, USA*

*May. 2019 - May. 2022*

### Master of Science in Computing

THE UNIVERSITY OF UTAH

- Graphics and Visualization Track, School of Computing
- Project: Dual-Split Trees for High Performance Ray Tracing

*Salt Lake City, USA*

*Aug. 2017 - May. 2019*

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

NATIONAL UNIVERSITY OF SINGAPORE

- Computer Science Program, School of Computing (Specialization: Visual Computing)
- Thesis: GPU Accelerated Path Tracing

*Singapore*

*Aug. 2013 - Jun. 2017*

## Work Experience

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### Research Scientist

NVIDIA RESEARCH

- Worked with the real-time rendering group on research and development of real-time ray tracing algorithms for visual experience in movies & games.

*Redmond, WA, USA*

*Jul. 2022 - Now*

### Research Intern

NVIDIA RESEARCH

- Worked in several research projects that uses real-time ray tracing to accelerate global illumination in games.

*Redmond, WA, USA (remote)*

*Jun. 2020 - Aug. 2020 and Jun. 2021 -*

*Aug. 2021*

### Rendering Programmer Intern

EPIC GAMES, INC.

- Developed new real-time ray tracing functions for future versions of Unreal Engine.
- Contributed to bug fixes in real-time ray tracing in Unreal Engine 4.23.

*Cary, NC, USA*

*May. 2019 - Aug. 2019*

### Software Engineering Intern

MATHWORKS, INC.

- Participated in the design and development of new functions in MATLAB's virtual globe system.
- 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, MA, USA*

*May. 2018 - Aug. 2018*

### Teaching Assistant

SCHOOL OF COMPUTING, UNIVERSITY OF UTAH

- Teaching assistant of two graduate courses, CS6610 Spring 2018, Spring 2019, Spring 2021 (Interactive Computer Graphics) and CS6620 Fall 2019 (Ray Tracing for Graphics).

*Salt Lake City, USA*

*Jan. 2018 - Now*

### Research Assistant

REALISTIC COMPUTER GRAPHICS GROUP, UNIVERSITY OF UTAH

- Working on GPU algorithms, real-time rendering, and high performance ray tracing in Dr. Cem Yuksel's Realistic Computer Graphics Group.

*Salt Lake City, USA*

*Sep. 2017 - Now*

## Graphics R&D Intern

HONG WEI GLOBAL

Singapore

May. 2015 - Nov. 2015

- 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.
- Extended the 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.

## Publications

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- **Virtual Blue Noise Lighting**, by Tianyu Li, Wenyu Wang, **Daqi Lin**, and Cem Yuksel.  
In Proceedings of ACM on Computer Graphics and Interactive Techniques (Proceedings of HPG 2022). **Wolfgang Straßer Best Paper Award, 3rd place**
- **Generalized Resampled Importance Sampling: Foundations of ReSTIR**, by **Daqi Lin**<sup>\*</sup>, Markus Kettunen<sup>\*</sup>, Benedikt Bitterli, Jacopo Pantalenoi, Cem Yuksel, and Chris Wyman. (<sup>\*</sup> joint first authors)  
In ACM Transactions on Graphics (Proceedings of SIGGRAPH 2022).
- **Fast Volume Rendering with Spatiotemporal Reservoir Resampling**, by **Daqi Lin**, Chris Wyman, and Cem Yuksel.  
In ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia 2021).
- **Hardware Adaptive High-Order Interpolation for Real-Time Graphics**, by **Daqi Lin**, Larry Seiler, and Cem Yuksel.  
In Computer Graphics Forum (Proceedings of HPG 2021). **Wolfgang Straßer Best Paper Award, 2nd place**
- **Hardware-Accelerated Dual-Split Trees**, by **Daqi Lin**, Elena Vasiou, Cem Yuksel, Daniel Kopta, and Erik Brunvand.  
In Proceedings of ACM on Computer Graphics and Interactive Techniques (Proceedings of HPG 2020).
- **Compacted CPU/GPU Data Compression via Modified Virtual Address Translation**, by Larry Seiler, **Daqi Lin**, and Cem Yuksel.  
In Proceedings of ACM on Computer Graphics and Interactive Techniques (Proceedings of HPG 2020).
- **Real-Time Stochastic Lightcuts**, by **Daqi Lin** and Cem Yuksel.  
In Proceedings of ACM on Computer Graphics and Interactive Techniques (Proceedings of I3D 2020). **Best Paper Award**
- **Automatic GPU Data Compression and Address Swizzling for CPUs via Modified Virtual Address Translation**, by Larry Seiler, **Daqi Lin** and Cem Yuksel.  
In Symposium on Interactive 3D Graphics and Games (I3D 2020).
- **Dual-Split Trees**, by **Daqi Lin**, Konstantin Shkurko, Ian Mallett, and Cem Yuksel.  
In Symposium on Interactive 3D Graphics and Games (I3D 2019). **The Best Conference Paper Award**
- **Real-Time Rendering with Lighting Grid Hierarchy**, by **Daqi Lin** and Cem Yuksel.  
In Proceedings of ACM on Computer Graphics and Interactive Techniques (Proceedings of I3D 2019)

## Academic Services

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- Conference Reviews: SIGGRAPH Asia 2022, SIGGRAPH 2022, PG 2021, EG 2021, ISMAR 2021
- Journal Reviews: JCGT, CGF, C&G

## Computer Skills

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- Programming languages: C/C++, Java, Python, JavaScript, MATLAB
- Web development: HTML/CSS/JavaScript, PHP, MySQL, WebGL
- Graphics and GPU Programming: CUDA, OpenGL 4, Direct3D 11/12
- Deep learning libraries: TensorFlow, PyTorch
- 3D modeling & rigging & game engine: Autodesk Maya, Blender
- Multimedia Editing: Adobe Premiere, Photoshop, Flash, Audition, Illustrator
- Music mixing & recording & arrangement : Ableton Live, FL Studio

## Honors & Awards

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- 2018 **Best Project Award** University of Utah Scientific Visualization Course  
(<https://n8vm.github.io/BSDF-Visualizer/>) *Salt Lake City, USA*
- Web-Based Visualization of Bidirectional Reflectance Distribution Functions (BRDFs)

- 2017 **Juror & Student Choice Awards** University of Utah Teapot Rendering Competition *Salt Lake City, USA*  
**Best In Class Award** (<http://graphics.cs.utah.edu/trc/?year=2017>)
- Created a ray tracing method to produce crescent-shaped shadows of tree leaves under solar eclipse.
- 2015 **Dean's List Award** Semester 2, Year 14/15, School of Computing, NUS *Singapore*
- Awarded only to top 5% students in the cohort.
- 2013 **Silver Prize** Orbital Program, held by School of Computing, NUS *Singapore*
- Developed an Online Karaoke platform which can perform real-time pitch shifting and human voice removal.