Lingqi Yan

Curriculum Vitae

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Education

2013 - 2018 **University of California, Berkeley**
Ph.D. in Computer Science
Advisor: Prof. Ravi Ramamoorthi
Dissertation: *Physically-based Modeling and Rendering of Complex Visual Appearance*

2009 - 2013 **Tsinghua University, Beijing, China**
B.E. in Computer Science and Technology
Advisors: Prof. Kun Xu
Thesis: *A Survey on Real-time Soft Shadow Rendering Techniques*

Employment

Since May 2023 **Consultant**
Intel Corporation

Since July 2018 **Assistant Professor**
Department of Computer Science
University of California, Santa Barbara

Summer 2017 **Intern at NVIDIA, Redmond**
Topic: Real-time ray tracing and reconstruction

Summer 2016 **Intern at Weta Digtal, Wellington**
Topic: Photorealistic cloth appearance modeling with ply level details

Summer 2015 **Intern at Autodesk, San Francisco**
Topic: Pre-computed real-time glints rendering

Summer 2014 **Technical intern at Walt Disney Animation Studios, Burbank**
Topic: Volumetric hair modeling and rendering for production

Interests and Impact

My research is in Computer Graphics, mainly aimed at rendering photo-realistic visual appearance at real world complexity, building theoretical foundations mathematically and physically to reveal the principles of the visual world. My research interests include appearance modeling, real-time ray tracing, sampling and reconstruction theory, volumetric scattering and light transport algorithms.

I am devoted to bringing original research topics to rendering, such as detailed appearance rendering from microstructure, physical light transport, spatiotemporal frame generation, and level-of-detail rendering of large scale scenes. My contributions have been recognized through various accolades, including the SIGGRAPH 2019 Outstanding Doctoral Dissertation Award and a SIGGRAPH 2022 Best Paper Honorable Mention.

As an educator, I enjoy teaching as much as research. I have been keeping an enjoyable atmosphere in class, and making materials modern and up to date. I have created two online courses GAMES101 and GAMES202, focusing on general introduction to graphics and specific real-time rendering, respectively. Up to May 2023, they have already been played more than 2.5 million times together.

Teaching

Winter 2023	CS292F: Real-Time High Quality Rendering	Instructor
Fall 2022	CS180/CS280: Introduction to Computer Graphics	Instructor
Spring 2022	CS190I: Introduction to Offline Rendering	Instructor
Winter 2022	CS291A: Real-Time High Quality Rendering	Instructor
Fall 2021	CS180: Introduction to Computer Graphics	Instructor
Spring 2021	GAMES202: Real-Time High Quality Rendering	Instructor
Spring 2021	CS291A: Real-Time High Quality Rendering	Instructor
Winter 2021	CS180/CS280: Introduction to Computer Graphics	Instructor
Fall 2020	CS190I: Introduction to Offline Rendering	Instructor
Spring 2020	GAMES101: Introduction to Computer Graphics	Instructor
Spring 2020	CS291A: Real-Time High Quality Rendering	Instructor
Winter 2020	CS180: Introduction to Computer Graphics	Instructor
Spring 2019	CS180: Introduction to Computer Graphics	Instructor
Winter 2019	CS291A: Real-Time High Quality Rendering	Instructor
Fall 2018	GAMES Webinar: Rendering Tutorial	Guest lecturer
Fall 2018	Introduction to Computer Graphics at Peking University	Guest lecturer
2014 - 2018	CSE167x: Computer Graphics on edx	Course staff
Spring 2018	CS184 and CS284A: Computer Graphics	Guest lecturer & TA
Spring 2017	CS184 and CS284A: Computer Graphics	Guest lecturer & TA
Fall 2011	Algorithms & Data Structures at Tsinghua University	Undergraduate TA
Fall 2009	Introduction to Programming at Tsinghua University	Undergraduate TA

Selected Honors and Awards

Awards	EGSR 2023 Best Paper Award	2023
	SIGGRAPH 2022 Technical Papers Awards: Best Paper Honorable Mention	2022
	ACM SIGGRAPH Outstanding Doctoral Dissertation Award	2019
	C.V. Ramamoorthy Distinguished Research Award	2018
Production	*Avatar: The Way of Water*: yarn-based cloth appearance model	2022
	War for the Planet of the Apes: animal fur appearance model	2016
	Nominee of Oscar best visual effects award	
	Autodesk Fusion 360: pre-computed real-time glints rendering	2015
	Zootopia: volumetric hair scattering simulation	2014
Fellowships	NVIDIA Graduate Fellowship	2017 - 2018
	Extraordinary Performance Scholarship	2011 - 2013
	National Scholarship	2010 - 2011
Contest	Silver Medal, ACM/ICPC 2010-2011 Programming Contest, Harbin Regional	2010

Media/Press Coverage

RealTime Conference: Panel Discussion	2021
Are We Ready To Create The Metaverse?	
Press Releases: Apple News, Plazma, Digital Trends, Engadget and Gizmodo	2018
AI is Making More Realistic CG Animal Fur	
Two Minute Papers	2017
#183: Photorealistic Fur With Multi-Scale Rendering	

#193: Light Transport on Specular Microstructure

SIGGRAPH Asia 2017 Cover/Title page 2017

A BSSRDF Model for Efficient Rendering of Fur with Global Illumination

SIGGRAPH 2017 Technical Papers Preview Trailer 2017

An Efficient and Practical Near and Far Field Fur Reflectance Model

Press Releases: UCSD, PhysOrg, Digital Trends, Eureka Alert and Tech Crunch 2016

Position-Normal Distributions for Efficient Rendering of Specular Microstructure

Press Releases: 4Gamer (Japanese), Tencent (Chinese) 2015

Physically-Accurate Fur Reflectance: Modeling, Measurement and Rendering

SIGGRAPH 2014 Technical Papers Preview Trailer 2014

Rendering Glints on High-Resolution Normal-Mapped Specular Surfaces

Discrete Stochastic Microfacet Models

Professional Services

Committee	SIGGRAPH Asia Technical Papers Committee	2023
	Eurographics Symposium on Rendering (EGSR) IPC	2023
	High Performance Graphics (HPG) IPC	2023
	SIGGRAPH Technical Papers Committee	2023
	Pacific Graphics IPC	2023
	Eurographics (EG) STAR IPC	2023
	Computer Graphics International 2023 (CGI 2023) Program Committee	2023
	Computer-Aided Design and Computer Graphics (CAD/Graphics) IPC	2023
	Eurographics Symposium on Rendering (EGSR) IPC	2022
	SIGGRAPH Technical Papers Committee	2022
	Eurographics (EG) IPC	2021
	SIGGRAPH Asia Technical Papers Committee	2021
	Computer-Aided Design and Computer Graphics (CAD/Graphics) IPC	2021
	Pacific Graphics Program Committee	2021
	Computational Visual Media (CVM) Program Committee	2021
	Pacific Graphics Program Committee	2020
	Computational Visual Media (CVM) Program Committee	2020
	SIGGRAPH Asia Technical Briefs and Posters Committee	2019
	Eurographics (EG) Short Papers IPC	2019
	Eurographics Symposium on Rendering (EGSR) IPC	2019
	Computer-Aided Design and Computer Graphics (CAD/Graphics) IPC	2019
Peer Reviews	ACM SIGGRAPH, ACM SIGGRAPH Asia, ACM Transactions on Graphics (ToG), Eurographics Symposium on Rendering (EGSR), IEEE Transactions on Visualization and Computer Graphics (TVCG), Computer Graphics Forum (CGF), Pacific Graphics (PG), Computational Visual Media (CVM), Journal of Computer Science and Technology (JCST), IEEE Virtual Reality (VR)	

Departmental Services

Graduate Admissions Committee	2022 - 2023
Undergraduate Student Affairs Committee	2022 - 2023
Graduate Admissions Committee	2021 - 2022
Undergraduate Student Affairs Committee	2021 - 2022
Graduate Admissions Committee	2020 - 2021

	Undergraduate Student Affairs Committee	2020 - 2021
	Graduate Admissions Committee	2019 - 2020
	Undergraduate Student Affairs Committee	2019 - 2020
	Graduate Admissions Committee	2018 - 2019
	Undergraduate Student Affairs Committee	2018 - 2019

Selected Talks

Invited Talks	Pursuing High-Performance in Photorealistic Rendering	06/27/2023
	[Keynote] High-Performance Graphics 2023, Delft, Netherlands	
	Lightweight Neural Networks in Appearance Modeling	2023
	Graphics and Imaging Lab, Universidad de Zaragoza	
	Towards Photorealistic Rendering: A Personal Perspective	2022
	Intel	
	Dynamic, Scalable and Fast Synthesis of Complex Visual Appearance	2022
	Intel	
	Next Generation Visual Appearance: Representation, Synthesis and Rendering	2021
	Blizzard Entertainment	
	Dynamic, Scalable and Fast Synthesis of Complex Visual Appearance	2021
	[Keynote] Computational Visual Media	
	Getting Started in Rendering Research	2020
	Chinagraph	
	Dynamic, Scalable and Fast Synthesis of Complex Visual Appearance	2020
	Facebook, Peking University	
	Towards Ultimate Realism in Rendering	2019
	SIGGRAPH 2019, Los Angeles	
	Next Generation Rendering: Photorealism and Speed	2018
	Tsinghua University, Peking University, University of Science and Technology of China, Zhejiang University, Microsoft Research Asia, Beihang University, Nanjing University of Science and Technology, Nanjing University	
	Real-Time Ray Tracing: Challenges and Opportunities	2018
	UCSD Center for Visual Computing	
	Physically-based Modeling and Rendering of Complex Visual Appearance	2018
	Adobe, San Jose	
	Distance-aware Filtering For Physically-based Monte Carlo Rendering Reconstruction	2017
	NVIDIA, Redmond	
	Industrial Approaches for Real-time Ray Tracing	2017
	UCSD Center for Visual Computing	
	Physically-Accurate Fur Reflectance: Modeling, Measurement and Rendering	2016
	UCSD Center for Visual Computing	
	Real-time Soft Shadows: Principles and Challenges	2013
	Distinguished Undergraduate Thesis Seminar, Tsinghua University	
Intern talks	Pre-computed Real-time Rendering of Imperfect Surfaces, Autodesk	2015
	Physically-based Rendering of Glints, Walt Disney Animation Studios	2014

Publications

A Realistic Surface-based Cloth Rendering Model

Junqiu Zhu, Adrian Jarabo, Carlos Aliaga, **Ling-Qi Yan**, Matt Jen-Yuan Chiang
SIGGRAPH 2023

Neural Prefiltering for Correlation-aware Levels of Detail
Philippe Weier, Tobias Zirr, Anton Kaplanyan, **Ling-Qi Yan**, Philipp Slusallek
ACM Transactions on Graphics [SIGGRAPH 2023]

Deep Real-time Volumetric Rendering Using Multi-feature Fusion
Jinkai Hu, Chengzhong Yu, Hongli Liu, **Ling-Qi Yan**, Yiqian Wu, Xiaogang Jin
SIGGRAPH 2023

Neural Biplane Representation for BTF Rendering and Acquisition
Jiahui Fan, Beibei Wang, Miloš Hašan, Jian Yang, **Ling-Qi Yan**
SIGGRAPH 2023

SpongeCake: A Layered Microflake Surface Appearance Model
Beibei Wang, Wenhua Jin, Miloš Hašan, **Ling-Qi Yan**
ACM Transactions on Graphics [2022]

Practical Level-of-detail Aggregation of Fur Appearance
Junqiu Zhu, Sizhe Zhao, Lu Wang, Yanning Xu, **Ling-Qi Yan**
ACM Transactions on Graphics [SIGGRAPH 2022]

Position-free Multiple-bounce Computations for Smith Microfacet BSDFs
Beibei Wang, Wenhua Jin, Jiahui Fan, Jian Yang, Nicolas Holzschuch, **Ling-Qi Yan**
ACM Transactions on Graphics [SIGGRAPH 2022]

Towards Practical Physical-Optics Rendering
Shlomi Steinberg, Pradeep Sen, **Ling-Qi Yan**
ACM Transactions on Graphics [SIGGRAPH 2022], **Best Paper Honorable Mention**

Neural Layered BRDFs
Jiahui Fan, Beibei Wang, Miloš Hašan, Jian Yang, **Ling-Qi Yan**
[SIGGRAPH 2022]

Constant-Cost Spatio-Angular Prefiltering of Glinty Appearance
Using Tensor Decomposition
Hong Deng, Yang Liu, Beibei Wang, Jian Yang, Lei Ma, Nicolas Holzschuch, **Ling-Qi Yan**
ACM Transactions on Graphics [2021]

Physical Light-Matter Interaction in Hermite-Gauss Space
Shlomi Steinberg, **Ling-Qi Yan**
ACM Transactions on Graphics [SIGGRAPH Asia 2021]

ExtraNet: Real-time Extrapolated Rendering for Low-latency Temporal Supersampling
Jie Guo, Xihao Fu, Liqiang Lin, Hengjun Ma, Yanwen Guo, Shiqiu Liu, **Ling-Qi Yan**
ACM Transactions on Graphics [SIGGRAPH Asia 2021]

Fast and Accurate Spherical Harmonics Products
Hanggao Xin, Zhiqian Zhou, Di An, **Ling-Qi Yan**, Kun Xu, Shi-Min Hu, Shing-Tung Yau
ACM Transactions on Graphics [SIGGRAPH Asia 2021]

Ensemble Denoising for Monte Carlo Renderings
Shaokun Zheng, Fengshi Zheng, Kun Xu, **Ling-Qi Yan**
ACM Transactions on Graphics [SIGGRAPH Asia 2021]

Rendering of Subjective Speckle Formed by Rough Statistical Surfaces
Shlomi Steinberg, **Ling-Qi Yan**
ACM Transactions on Graphics [2021]

A Generic Framework for Physical Light Transport

Shlomi Steinberg, **Ling-Qi Yan**

ACM Transactions on Graphics [SIGGRAPH 2021]

Neural Complex Luminaires: Representation and Rendering

Junqiu Zhu, Yaoyi Bai, Zilin Xu, Steve Bako, Edgar Velázquez-Armendáriz, Lu Wang, Pradeep Sen, Miloš Hašan, **Ling-Qi Yan**

ACM Transactions on Graphics [SIGGRAPH 2021]

Volumetric Appearance Stylization With Stylizing Kernel Prediction Network

Jie Guo, Mengtian Li, Zijing Zong, Yuntao Liu, Jingwu He, Yanwen Guo, **Ling-Qi Yan**

ACM Transactions on Graphics [SIGGRAPH 2021]

Highlight-Aware Two-Stream Network for Single-Image SVBRDF Acquisition

Jie Guo, Shuichang Lai, Chengzhi Tao, Yuelong Cai, Lei Wang, Yanwen Guo, **Ling-Qi Yan**

ACM Transactions on Graphics [SIGGRAPH 2021]

Vectorization for Fast, Analytic, and Differentiable Visibility

Yang Zhou, Lifan Wu, Ravi Ramamoorthi, **Ling-Qi Yan**

ACM Transactions on Graphics [2021]

Path Cuts: Efficient Rendering of Pure Specular Light Transport

Beibei Wang, Miloš Hašan, **Ling-Qi Yan**

ACM Transactions on Graphics [SIGGRAPH Asia 2020]

Example-Based Microstructure Rendering with Constant Storage

Beibei Wang, Miloš Hašan, Nicolas Holzschuch, **Ling-Qi Yan**

ACM Transactions on Graphics [2019, Presented at SIGGRAPH 2020]

Learning Generative Models for Rendering Specular Microgeometry

Alexandr Kuznetsov, Miloš Hašan, Zexiang Xu, **Ling-Qi Yan**, Bruce Walter, Nima Khademi Kalantari, Steve Marschner, Ravi Ramamoorthi

ACM Transactions on Graphics [SIGGRAPH Asia 2019]

GradNet: Unsupervised Deep Screened Poisson Reconstruction for Gradient-Domain Rendering

Jie Guo, Mengtian Li, Quewei Li, Yuting Qiang, Bingyang Hu, Yanwen Guo, **Ling-Qi Yan**

ACM Transactions on Graphics [SIGGRAPH Asia 2019]

Fractional Gaussian Fields for Modeling and Rendering of Spatially-Correlated Media

Jie Guo, Yanjun Chen, Bingyang Hu, **Ling-Qi Yan**, Yanwen Guo, Yuntao Liu

ACM Transactions on Graphics [SIGGRAPH 2019]

Accurate Appearance Preserving Prefiltering for Rendering Displacement-Mapped Surfaces

Lifan Wu, Shuang Zhao, **Ling-Qi Yan**, Ravi Ramamoorthi

ACM Transactions on Graphics [SIGGRAPH 2019]

Rendering Specular Microgeometry with Wave Optics

Ling-Qi Yan, Miloš Hašan, Bruce Walter, Steve Marschner, Ravi Ramamoorthi

ACM Transactions on Graphics [SIGGRAPH 2018]

A BSSRDF Model for Efficient Rendering of Fur with Global Illumination

Ling-Qi Yan, Weilun Sun, Henrik Wann Jensen, Ravi Ramamoorthi

ACM Transactions on Graphics [SIGGRAPH Asia 2017]

An Efficient and Practical Near and Far Field Fur Reflectance Model

Ling-Qi Yan, Henrik Wann Jensen, Ravi Ramamoorthi

ACM Transactions on Graphics [SIGGRAPH 2017]

Antialiasing Complex Global Illumination Effects in Path-space
Laurent Belcour, **Ling-Qi Yan**, Ravi Ramamoorthi, Derek Nowrouzezahrai
ACM Transactions on Graphics [2016, Presented at SIGGRAPH 2017]

Position-Normal Distributions for Efficient Rendering of Specular Microstructure
Ling-Qi Yan, Miloš Hašan, Steve Marschner, Ravi Ramamoorthi
ACM Transactions on Graphics [SIGGRAPH 2016]

Physically-Accurate Fur Reflectance: Modeling, Measurement and Rendering
Ling-Qi Yan, Chi-Wei Tseng, Henrik Wann Jensen, Ravi Ramamoorthi
ACM Transactions on Graphics [SIGGRAPH Asia 2015]

Fast 4D Sheared Filtering for Interactive Rendering of Distribution Effects
Ling-Qi Yan, Soham Uday Mehta, Ravi Ramamoorthi, Fredo Durand
ACM Transactions on Graphics [2015, Presented at SIGGRAPH 2016]

Rendering Glints on High-Resolution Normal-Mapped Specular Surfaces
Ling-Qi Yan, Miloš Hašan, Wenzel Jakob, Jason Lawrence, Steve Marschner, Ravi Ramamoorthi
ACM Transactions on Graphics [SIGGRAPH 2014]

Discrete Stochastic Microfacet Models
Wenzel Jakob, Miloš Hašan, **Ling-Qi Yan**, Jason Lawrence, Ravi Ramamoorthi, Steve Marschner
ACM Transactions on Graphics [SIGGRAPH 2014]

EGSR/CGF **Ray-aligned Occupancy Map Array for Fast Approximate Ray Tracing**
Zheng Zeng, Zilin, Xu, Lifan Wu, Lu Wang, **Ling-Qi Yan**
Computer Graphics Forum [EGSR 2023]

A Practical and Hierarchical Yarn-based Shading Model for Cloth
Junqiu Zhu, Zahra Montazeri, Jean-Marie Aubry, **Ling-Qi Yan**, Andrea Weidlich
Computer Graphics Forum [EGSR 2023]

Real-Time Microstructure Rendering with MIP-mapped Normal Map Samples
Haowen Tan, Junqiu Zhu, Yanning Xu, Xiangxu Meng, Lu Wang, **Ling-Qi Yan**
Computer Graphics Forum [2022]

Temporally Reliable Motion Vectors for Real-time Ray Tracing
Zheng Zeng, Shiqiu (Edward) Liu, Jinglei Yang, Lu Wang, **Ling-Qi Yan**
Computer Graphics Forum [Eurographics 2021]

Path-based Monte Carlo Denoising Using a Three-Scale Neural Network
Weiheng Lin, Beibei Wang, Jian Yang, Lu Wang, **Ling-Qi Yan**
Computer Graphics Forum [2020]

A Bayesian Inference Framework for Procedural Material Parameter Estimation
Yu Guo, Miloš Hašan, **Ling-Qi Yan**, Shuang Zhao
Computer Graphics Forum [Pacific Graphics 2020]

Adaptive BRDF-Oriented Multiple Importance Sampling of Many Lights
Yifan Liu, Kun Xu, **Ling-Qi Yan**
Computer Graphics Forum 38(4) [EGSR 2019]

Multiple Axis-Aligned Filters for Rendering of Combined Distribution Effects
Lifan Wu, **Ling-Qi Yan**, Alexandr Kuznetsov, Ravi Ramamoorthi
Computer Graphics Forum 36(4) [EGSR 2017]

Accurate Translucent Material Rendering under Spherical Gaussian Lights
Ling-Qi Yan, Yahan Zhou, Kun Xu, Rui Wang
Computer Graphics Forum 31(7) [Pacific Graphics 2012]

Others **On the Properties of the Anisotropic Multivariate Hermite-Gauss Functions**
Shlomi Steinberg, Ömer Eğecioğlu, **Ling-Qi Yan**
Hacettepe Journal of Mathematics and Statistics [2023]

Recent Advances in Glinty Appearance Rendering
Junqiu Zhu, Sizhe Zhao, Yanning Xu, Xiangxu Meng, Lu Wang, **Ling-Qi Yan**
Computational Visual Media [2022]

Efficient Specular Glints Rendering with Differentiable Regularization
Jiahui Fan, Beibei Wang, Wenshi Wu, Miloš Hašan, Jian Yang, **Ling-Qi Yan**
IEEE Computer Graphics and Applications [2022]

Rendering Discrete Participating Media with Geometrical Optics Approximation
Jie Guo, Bingyang Hu, Yanjun Chen, Yuanqi Li, Yanwen Guo, **Ling-Qi Yan**
Computational Visual Media, [2021]

A Survey on Homogeneous Participating Media Rendering
Wenshi Wu, Beibei Wang, **Ling-Qi Yan**
Computational Visual Media, [2021]

Temporally Reliable Motion Vectors for Better Use of Temporal Information
Zheng Zeng, Shiqiu (Edward) Liu, Jinglei Yang, Lu Wang, **Ling-Qi Yan**
Ray Tracing Gems II: Chapter 25 [2021]

Realistic Rendering in "Details"
Ling-Qi Yan
IEEE Computer Graphics and Applications [2021]

Foveated Photon Mapping
Xuehuai Shi, Lili Wang, Xiaoheng Wei, **Ling-Qi Yan**
IEEE Transactions on Visualization and Computer Graphics [2021]

Foveated Instant Radiosity
Lili Wang, Runze Li, Xuehuai Shi, **Ling-Qi Yan**, Zhichao Li
IEEE International Symposium on Mixed and Augmented Reality (ISMAR) [2020]