

# 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. Shi-Min Hu and Prof. Kun Xu  
Thesis: *A Survey on Real-time Soft Shadow Rendering Techniques*

## Employment

- Since 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 Digital, 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

## Research 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 have brought original research topics to Computer Graphics, such as detailed rendering from microstructure and real-time sampling and reconstruction for ray tracing. During my Ph.D. study, I have published a record-breaking number of 7 first authored ACM SIGGRAPH/ACM TOG papers. And I won the SIGGRAPH Outstanding Doctoral Dissertation Award in 2019.

## Teaching

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|-------------|--|------------|
| Winter 2022 | CS291A: Real-Time High Quality Rendering       | Instructor |
| Fall 2021   | CS180: Introduction to Computer Graphics       | 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	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	ACM SIGGRAPH Outstanding Doctoral Dissertation Award	2019
	C.V. Ramamoorthy Distinguished Research Award	2018
Fellowships	NVIDIA Graduate Fellowship	2017 - 2018
	Extraordinary Performance Scholarship	2011 - 2013
	National Scholarship	2010 - 2011
Production	<i>War for the Planet of the Apes</i> : animal fur appearance model	2016
	Nominee of Oscar best visual effects award	
	<i>Autodesk Fusion 360</i> : pre-computed real-time glints rendering	2015
	<i>Zootopia</i> : volumetric hair scattering simulation	2014
Contest	Silver Medal, ACM/ICPC 2010-2011 Programming Contest, Harbin Regional	2010

## Media/Press Coverage

RealTime Conference: Panel Discussion	Are We Ready To Create The Metaverse?	2021
Press Releases: Apple News, Plazma, Digital Trends, Engadget and Gizmodo	AI is Making More Realistic CG Animal Fur	2018
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	Eurographics Symposium on Rendering (EGSR) IPC	2022
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	SIGGRAPH Technical Papers Committee	2022
	Eurographics (EG) IPC (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 International Program Committee (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)	

## Departmental Services

	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	Next Generation Visual Appearance: Representation, Synthesis and Rendering Blizzard Entertainment	2021
	Dynamic, Scalable and Fast Synthesis of Complex Visual Appearance Computational Visual Media (Keynote Speaker)	2021
	Dynamic, Scalable and Fast Synthesis of Complex Visual Appearance Facebook, Peking University	2020
	Towards Ultimate Realism in Rendering SIGGRAPH 2019, Los Angeles	2019
	Next Generation Rendering: Photorealism and Speed 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	2018
	Real-Time Ray Tracing: Challenges and Opportunities UCSD Center for Visual Computing	2018
	Physically-based Modeling and Rendering of Complex Visual Appearance Adobe, San Jose	2018
	Distance-aware Filtering For Physically-based Monte Carlo Rendering Reconstruction NVIDIA, Redmond	2017

	Industrial Approaches for Real-time Ray Tracing UCSD Center for Visual Computing	2017
	Physically-Accurate Fur Reflectance: Modeling, Measurement and Rendering UCSD Center for Visual Computing	2016
	Real-time Soft Shadows: Principles and Challenges Distinguished Undergraduate Thesis Seminar, Tsinghua University	2013
Intern talks	Pre-computed Real-time Rendering of Imperfect Surfaces, Autodesk	2015
	Physically-based Rendering of Glints, Walt Disney Animation Studios	2014

## Publications

- SIGGRAPH/ToG **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 **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 **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]