

ABOUT ME

My background is mainly focused on **Computer Graphics**, specially in **Physics-based Rendering** and **Inverse-rendering**. I am also interested in **Material Capture and generation** by using **GAN/Diffusion** model. How to decompose **light/shadow** and material properties from a 3D model (Mesh/NeRF/**3DGS**) and make it **relightable** and **editable** are what I am willing to solve. Besides, I am interested in any project related to **Meta Human**. See last page for more information.

EDUCATION

University of California, Irvine

Irvine, CA, US

Ph.D in Computer Science

Sept. 2016 – Aug. 2021

Dissertation: Multi-scale Appearance Modeling of Complex Materials.

Advisor: [Shuang Zhao](#)

University of Chinese Academy of Sciences

Beijing & Shenzhen, China

M.S. in Computer Science

Sept. 2010 – Jul. 2013

Thesis: GPU-based Soft Body Deformation with Nonlinear Finite Element Method.

Advisor: [Pheng Ann Heng](#) (CUHK)

Central South University

Changsha, China

B.S. in Mathematics and Applied Mathematics

Sept. 2006 – Jul. 2010

Thesis: Forces Distribution with Fractal Theory in High Velocity Compaction Technology.

WORKING
EXPERIENCES

George Mason University (Researcher)

Remote, US

Projects: Light-stage reconstruction; 3D Gaussian splat relighting.

Feb. 2024 – Sept. 2024

Advisor: [Jinwei Ye](#), [Yu Ji](#)

Tencent America, IEG (Senior Researcher)

New York & Playa Vista, CA, US

Projects:

Sept. 2021 – Sept. 2024

- Video generation: *Re-stylization and stabilization of rendered MMD model with Stable diffusion.*

- Product image generation: *We use fine-tuned Diffusion model to generate high quality image, and use image-based relighting technique to make the foreground and background lighting consistent.*

- Texture map delighting: *Remove shadows and highlights in texture maps and make Photogrammetry pipeline more efficient.*

- Unreal Engine 5 plug-in: *Volumetric rendering with multiple scattering and phase function supported.*

Manager: [Changxi Zheng](#) and [Bo Yang](#)

Facebook Reality Lab (Internship)

Sausalito, CA, US

Projects: Eye caustics rendering and its inverse problem.

July. 2020 – Sept. 2020

Advisor: [Christophe Hery](#), [Olivier Maury](#)

Adobe Research (Internship)

San Jose, CA, US

Projects: Material capture and estimation.

July. 2019 – Sept. 2019

Advisor: [Miloš Hašan](#), [Kalyan Sunkavalli](#)

Megvii (Face++) Research (Internship)

Redmond, WA, US

Projects: Human face shadow/highlight removal and face relighting.

July. 2018 – Sept. 2018

Advisor: [Jue Wang](#)

Autodesk (Internship)

San Francisco, CA, US

Projects: Efficient volumetric rendering of 3D-printing materials.

July. 2017 – Sept. 2017

Advisor: [Miloš Hašan](#)

Nanyang Technological University

Singapore

Research Associate at BeingThere Centre (*BTC*), IMI

Oct. 2013 – Mar. 2016

(BTC is a US\$18 million international research project on 3D Telepresence and Virtual Reality between ETH ([Markus Gross](#)), UNC ([Henry Fuchs](#)) and NTU ([Nadia Magnenat Thalmann](#)).)

Projects: Stereo rendering; Physical-based video manipulation; Virtual try-on system for prescription glasses.

Collaborators: [Miriam Reiner](#), [Jean-Charles Bazin](#), [Tobias Martin](#), [Claudia Plüss](#), [Pierre-Yves Laffont](#), [Qian Zhang](#)

Advisor: [Tat-Jen Cham](#)

Shenzhen Institutes of Advanced Technology

Shenzhen, China

Research Assistant at HCI lab

Sept. 2011 – Jul. 2013

Projects: Mesh processing; Soft body simulation; Virtual surgery; CUDA acceleration.

Advisor: Pheng-Ann Heng, Yongming Xie

SELECTED
PUBLICATIONS

“**BiGS: Bidirectional Gaussian Primitives for Relightable 3D Gaussian Splatting**” by Liu Zhenyuan, **Yu Guo**, Xinyuan Li, Bernd Bickel, Ran Zhang. (*Arxiv 2024*)

“**Textureless Deformable Object Tracking with Invisible Markers**” by Xinyuan Li, **Yu Guo**, Yubei Tu, Yu Ji, Yanchen Liu, Jinwei Ye, Changxi Zheng. (*ICCP 2024 and TPAMI Special Issue*)

“**Woven Fabric Capture from a Single Photo**” by Wenhua Jin, Beibei Wang, Milos Hasan, **Yu Guo**, Steve Marschner and Lingqi Yan. (*SIGGRAPH Asia 2022*)

“**Beyond Mie Theory: Systematic Computation of Bulk Scattering Parameters based on Microphysical Wave Optics**” by **Yu Guo**, Adrian Jarabo and Shuang Zhao. (*SIGGRAPH Asia 2021 and TOG 2021*)

“**MaterialGAN: Reflectance Capture using a Generative SVBRDF Model**” by **Yu Guo**, Cameron Smith, Miloš Hašan, Kalyan Sunkavalli and Shuang Zhao. (*SIGGRAPH Asia 2020 and TOG 2020*)

“**A Bayesian Inference Framework for Procedural Material Parameter Estimation**” by **Yu Guo**, Miloš Hašan, Lingqi Yan and Shuang Zhao. (*PG 2020 and CGF 2020*)

“**Position-Free Monte Carlo Simulation for Arbitrary Layered BSDFs**” by **Yu Guo**, Miloš Hašan and Shuang Zhao. (*SIGGRAPH Asia 2018 and TOG 2018*)

“**A Virtual Try-on System for Prescription Eyeglasses**” by Qian Zhang, **Yu Guo**, Pierre-Yves Laffont, Tobias Martin, and Markus Gross. (*CG&A 2017*)

“**Physically Based Video Editing**” by Jean-Charles Bazin, Claudia Plüss (Kuster), **Yu Guo**, Tobias Martin, Alec Jacobson, and Markus Gross. (*PG 2016 and CGF 2016*)

“**A GPU-Accelerated Finite Element Solver for Simulation of Soft-Body Deformation**” by **Yu Guo**, Jianying Li, Ping Liu, Qiong Wang, and Jing Qin. (*ICIA 2013*)

“**A Master-Slave Robotic Simulator Based on GPUDirect**” by Jianying Li, **Yu Guo**, Heye Zhang, Yongming Xie. (*IROS 2012*)

REVIEWS

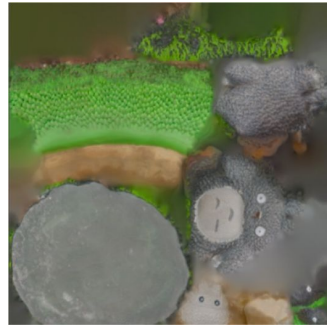
TOG, CGF, SIGGRAPH, SIGGRAPH Asia, EG, PG

Previous Projects (main contribution)

Tencent America:



- UE5 plugin
- Snow rendering
- Multiple scattering



- Photogrammetry
- Texture delighting
- Shadow removal



- Image generation
- Diffusion models
- Relighting



- Cartoon stylization
- Stable Diffusion
- Video stabilization

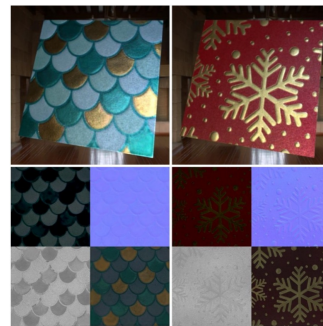
PhD:



- Forward rendering
- Layered BSDF
- PBRT-v4



- Volume rendering
- Wave optics

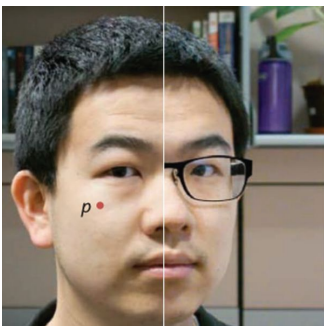


- Inverse-rendering
- SVBRDF
- MaterialGAN

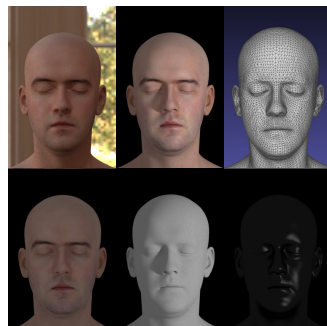


- Procedural material
- Bayesian theory
- MCMC sampling

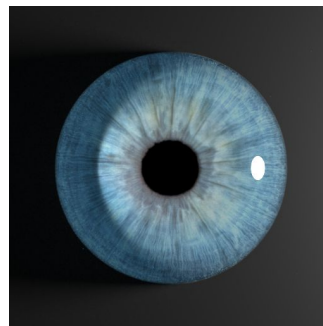
Human face related:



- Virtual try-on
- Prescription glasses



- Face relighting
- Face rendering



- Eye rendering
- Eye reconstruction