Mengqi (Mandy) Xia

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Research Interests

Physically-based Rendering, Material Models, Differentiable Rendering, Inverse Rendering.

Education

École polytechnique fédérale de Lausanne (EPFL) *Laussane, VD, Switzerland*

Postdoctoral researcher at the Realistic Graphics Lab *Sept 2022 - Present*

- Advisor: **Prof. Wenzel Jakob**.

Cornell University *Ithaca, NY, USA*

Ph.D. student in Computer Science *Aug 2016 - July 2022*

- Advisor: **Prof. Steve Marschner**.

University of California, Los Angeles *Los Angeles, CA, USA*

B.S. in Applied Mathematics with specialization in computing *Sept 2012 - June 2016*

- Graduated with Summa Cum Laude.

Publications

A Practical Wave Optics Reflection Model for Hair and Fur

Mengqi (Mandy) Xia, Bruce Walter, Christophe Hery, Olivier Maury, Eric Michielssen, Steve Marschner

ACM Transactions on Graphics (Proceedings of SIGGRAPH 2023).

A Full-Wave Reference Simulator for Computing Surface Reflectance

Yunchen Yu, **Mengqi (Mandy) Xia**, Bruce Walter, Eric Michielssen, Steve Marschner

ACM Transactions on Graphics (Proceedings of SIGGRAPH 2023).

Iridescent Water Droplets Beyond Mie Scattering

Mengqi (Mandy) Xia, Bruce Walter, Steve Marschner

Computer Graphics Forum 42 (4) (Proceedings of Eurographics Symposium on Rendering 2023).

A Hyperspectral Space of Skin Tones for Inverse Rendering of Biophysical Skin Properties

Carlos Aliaga, **Mengqi (Mandy) Xia**, Hao Xie, Adrian Jarabo, Gustav Braun, Christophe Hery

Computer Graphics Forum 42 (4) (Proceedings of Eurographics Symposium on Rendering 2023).

A Wave Optics Based Fiber Scattering Model

Mengqi (Mandy) Xia, Bruce Walter, Eric Michielssen, David Bindel, Steve Marschner

ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia 2020).

Gaussian Product Sampling for Rendering Layered Materials

Mengqi (Mandy) Xia, Bruce Walter, Christophe Hery, Steve Marschner

Computer Graphics Forum 39 (1), 420-435 (2020).

An Efficient Primal-Dual Method for the Obstacle Problem

Dominique Zosso, Braxton Osting, **Mandy (Mengqi) Xia**, Stanley Osher

Journal of Scientific Computing 73.1: 416-437 (2017).

Physically Realistic Rendering of Complex Materials Using Wave Optics

Mandy (Mengqi) Xia

PhD thesis, Cornell University, 2022

Honors & Awards

2022, 2023	**Rising Stars in Computer Graphics**, WiGRAPH	*Co-located with SIGGRAPH*
Nov, 2020	**Rising Stars in EECS**, University of California, Berkeley	*Remote*
2012-2016	**Dean's Honors List**, UCLA	*Los Angeles, USA*
May, 2014	**Best Visualization Honorable Mention**, Datafest	*Los Angeles, USA*

Professional Services

Reviewer for SIGGRAPH, SIGGRAPH Asia, Eurographics, Journal of Computer Graphics Techniques, Journal of Quantitative Spectroscopy and Radiative Transfer.

Invited talks

Aug, 2023	**A Practical Wave Optics Reflection Model for Hair and Fur**, SIGGRAPH 2023	*Los Angeles, USA*
Jun, 2023	**Iridescent Water Droplets Beyond Mie Scattering**, EGSR 2023	*Delft, Netherlands*
Mar, 2023	**Physically Realistic Rendering of Complex Materials Using Wave Optics**, University of Zurich	*Zurich, Switzerland*
Jan, 2022	**Physically Realistic Rendering of Complex Materials Using Wave Optics**, UCSD	*Remote*
May, 2021	**Gaussian Product Sampling for Rendering Layered Materials**, Eurographics 2021	*Remote*
Dec, 2020	**A Wave Optics Based Fiber Scattering Model**, SIGGRAPH Asia 2020	*Remote*

Research Experience

Facebook Reality Labs — *Remote*

Research Intern — *May 2021 - Sept 2021*

- Proposed a new hybrid model that combines wave optics and ray optics for more realistic fiber appearance.
- Supervised by **Dr. Christophe Hery**.

Facebook Reality Labs — *Remote*

Research Intern — *May 2020 - Sept 2020*

- Developed a bio-physics based neural skin model that can reconstruct skin diffuse albedo with high accuracy.
- Evaluated the neural skin model for various types of skintones and demonstrated robustness in skin appearance editing.
- Supervised by **Dr. Christophe Hery** and **Dr. Carlos Aliaga**.

Pixar Animation Studios — *Emeryville, CA, USA*

Research Intern — *June 2018 - Sept 2018*

- Developed a general layered material model and realistically reproduced complex appearances.
- Introduced two sampling strategies for the Monte Carlo method and improved the efficiency by 2x - 25x.
- Implemented and tested the new BSDF model in Renderman.
- Supervised by **Dr. Christophe Hery** and **Dr. Mark Meyers**.

UCLA Computer Graphics and Vision Lab — *Los Angeles, CA, USA*

Research Assistant — *Aug 2015 - June 2016*

- Implemented the Affine Particle-in-Cell Method.
- Compared with state-of-the-art smoke simulation methods including Semi-Lagrangian, FLIP, FLIP-IVOCK.
- Collaborated with Yichen Chen, supervised by **Prof. Joseph Teran** and **Prof. Chenfanfu Jiang**.

Teaching Experience

Master project	Yuxin Wang, Line by Line Absorption Coefficient Solver, *EPFL*	*Feb 2023 - June 2023*
Master project	Ningwei Ma, Hair shading implementation in Mitsuba 3, *EPFL*	*Sept 2022 - Jan 2023*
Undergraduate project	Helen Wang, Wavefront tracing, *co-advised with Yunchen Yu, Cornell University*	*Sept 2021 - May 2022*
Undergraduate project	Ryan Lefkowitz, Elliptical fiber rendering, *Cornell University*	*Jan 2020 - May 2020*
Undergraduate project	Jeremy Paton, Procedural modeling in Houdini, *Cornell University*	*Jan 2017 - May 2017*

CS5625 Interactive Computer Graphics — *Cornell University*

Teaching Assistant — *Jan 2019 - May 2019*

Held office hours, graded homework and exams.

CS4620 Introduction to Computer Graphics — *Cornell University*

Teaching Assistant — *Jan 2018 - May 2018*

- Helped Prof. Steve Marschner design exam problems, written and programming homework.
- Held office hours, graded homework and exams.
- Led rendering reading group discussion among course staff.

CS1112 Introduction to Computing Using MATLAB — *Cornell University*

Teaching Assistant — *Sept 2016 - May 2017*

Led discussion sessions, held office hours, and graded homework and exams.

Undergraduate Mathematics Student Association (UMSA) — *UCLA*

Mentorship Manager — *Mar 2014 - June 2015*

- Organized graduate school application and job hunting panels and resume critique workshop.
- Led the mentor interview and selection process and coordinated 12 mentorship groups involving 80 people.
- Mentored 3 first year undergraduate students.

Math 32A (Multivariable Calculus), 115A (Linear Algebra), PIC 10B (C++) — *UCLA*

Grader — *Sept 2014 - Dec 2015*

Skills

Computer Languages: C++, Python, MATLAB, Java

Tools: LaTeX, Emacs, PyTorch, OpenCV