

# Mengqi (Mandy) Xia

✉ mengqi.xia@epfl.ch    🌐 mandyxmq.github.io

## Research Interests

---

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

## Education

---

### École polytechnique fédérale de Lausanne (EPFL)

POSTDOCTORAL RESEARCHER AT THE REALISTIC GRAPHICS LAB

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

Laussane, VD, Switzerland

Sept 2022 - Present

### Cornell University

PH.D. STUDENT IN COMPUTER SCIENCE

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

Ithaca, NY, USA

Aug 2016 - July 2022

### University of California, Los Angeles

B.S. IN APPLIED MATHEMATICS WITH SPECIALIZATION IN COMPUTING

- Graduated with Summa Cum Laude.

Los Angeles, CA, USA

Sept 2012 - June 2016

## 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, Eurographic, Journal of Computer Graphics Techniques, Journal of Quantitative Spectroscopy and Radiative Transfer.

## Invited talks

---

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

## Research Experience

---

### Facebook Reality Labs

RESEARCH INTERN

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

Remote  
May 2021 - Sept 2021

### Facebook Reality Labs

RESEARCH INTERN

- 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**.

Remote  
May 2020 - Sept 2020

### Pixar Animation Studios

RESEARCH INTERN

- 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**.

Emeryville, CA, USA  
June 2018 - Sept 2018

### UCLA Computer Graphics and Vision Lab

RESEARCH ASSISTANT

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

Los Angeles, CA, USA  
Aug 2015 - June 2016

## 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

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

TEACHING ASSISTANT

Held office hours, graded homework and exams.

Cornell University  
Jan 2019 - May 2019

### CS4620 Introduction to Computer Graphics

TEACHING ASSISTANT

- 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.

Cornell University  
Jan 2018 - May 2018

### CS1112 Introduction to Computing Using MATLAB

TEACHING ASSISTANT

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

Cornell University  
Sept 2016 - May 2017

### Undergraduate Mathematics Student Association (UMSA)

MENTORSHIP MANAGER

- 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.

UCLA  
Mar 2014 - June 2015

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

GRADER

UCLA  
Sept 2014 - Dec 2015

## Skills

---

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

**Tools:**  $\text{\LaTeX}$ , Emacs, PyTorch, OpenCV