

Kenneth Chen

PhD Student

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Research Interests

I am broadly interested in computer graphics & displays, VR/AR, psychophysics, high dynamic range, color, tone mapping, image quality, and more. My thesis work focuses on developing power optimization algorithms for wide-field-of-view displays, especially by leveraging data from studies of human preference and visual psychophysics.

Education

New York University

2023 – *PhD in Computer Science*

2021 – 2023 *MS in Computer Science*

Supervised by Prof. Qi Sun

University of California, Berkeley

2017 – 2021 *BA in Computer Science*

Supervised by Prof. Carlo Sequin

Publications

2025

What is HDR? Perceptual Impact of Luminance and Contrast in Immersive Displays

K. Chen, N. Matsuda, J. McElvain, Y. Zhao, T. Wan, Q. Sun[†], A. Chapiro[†]

ACM SIGGRAPH

Image-GS: Content-Adaptive Image Representation via 2D Gaussians

Y. Zhang, B. Li, A. Kuznetsov, A. Jindal, S. Diolatzis, **K. Chen**, A. Sochenov, A. Kaplanyan, Q. Sun

ACM SIGGRAPH

Novel View Synthesis for 3D Computer-Generated Holograms Using Deep Neural Fields

K. Chen, A. Wen, Y. Zhang, P. Chakravarthula, Q. Sun

Optics Express

Process Only Where You Look: Hardware and Algorithm Co-optimization for Efficient Gaze-Tracked Image Rendering in Virtual Reality

H. Wang, W. Liu, **K. Chen**, Q. Sun, S. Q. Zhang

ACM/IEEE ISCA

Perceptually-Guided Acoustic “Foveation”

X. Peng, **K. Chen**, I. Roman, J. P. Bello, P. Chakravarthula, Q. Sun
IEEE VR

2024

PEA-PODs: Perceptual Evaluation of Algorithms for Power Optimization in XR Displays

K. Chen, T. Wan, N. Matsuda, A. Ninan, A. Chapiro[†], Q. Sun[†]
ACM SIGGRAPH | Best Paper Award, Honorable Mention

Exploiting Human Color Discrimination for Memory- and Energy-Efficient Image Encoding in Virtual Reality

N. Ujjainkar, E. Shahan, **K. Chen**, B. Duinkharjav, Q. Sun, Y. Zhu
ACM ASPLOS

2023

Toward Optimized VR/AR Ergonomics: Modeling and Predicting User Neck Muscle Contraction

Y. Zhang, **K. Chen**, Q. Sun
ACM SIGGRAPH

2022

Color-Perception-Guided Display Power Reduction for Virtual Reality

B. Duinkharjav*, **K. Chen***, A. Tyagi, J. He, Y. Zhu, Q. Sun
ACM SIGGRAPH Asia

Other Publications

2024

BlendFusion: Procedural 3D Texturing Assistant with View-Consistent Generative Models

Q. Li, F. Torrens, **K. Chen**, Q. Sun
ACM I3D | Poster | Best Poster Award

2023

Imperceptible Color Modulation for Power Saving in VR/AR

K. Chen, B. Duinkharjav, N. Ujjainkar, E. Shahan, A. Tyagi, J. He, Y. Zhu, Q. Sun
ACM SIGGRAPH | Emerging Technologies

Towards Learning and Generating Audience Motion from Video

K. Chen, N. I. Badler
ACM SCA | Poster

Honors and Awards

2025

Best Poster Award, ACM I3D 2025

For “BlendFusion: Procedural 3D Texturing Assistant with View-Consistent Generative Models”.

2025

Deborah Rosenthal, MD Award, NYU

“Awarded to a graduate student in CS for outstanding performance on the PhD qualifying examination.”

2024 – 2025

U.S. DoE Graduate Assistance in Areas of National Need Fellowship (GAANN), NYU

“This program provides fellowships, through academic departments and programs of IHEs, to assist graduate students with excellent records who demonstrate financial need and plan to pursue the highest degree available in their course study at the institution in a field designated as an area of national need.”

- 2024 **Best Paper Award (Honorable Mention), ACM SIGGRAPH 2024**
For the paper “PEA-PODs: Perceptual Evaluation of Algorithms for Power Optimization in XR Displays”.
- 2023 **Tandon School of Engineering PhD Fellowship, NYU**
- 2021 **Graduate Scholarship, NYU**
- 2020 **Computer Graphics (CS 184) Final Project Showcase Winner, UC Berkeley**
- 2019 **Probability and Random Processes (EE 126) Catan AI Competition 1st Place, UC Berkeley**

Patents

- 2025 **Perceptual Algorithms and Design Interface to Save Display Power**
A. Chapiro, **K. Chen**, A. Ninan, R. Bachy, J. Hillis, C. C. Wan, N. Matsuda
US Patent 2025 0199750 A1
- 2025 **Color-Perception-Guided Display Power Reduction for Extended Reality**
Q. Sun, Y. Zhu, B. Duinkharjav, **K. Chen**, A. Tyagi, J. He
US Patent 2025 0095532 A1
- 2025 **Human Color Discrimination for Memory-Efficient Encoding in Extended Reality**
Y. Zhu, Q. Sun, N. Ujjainkar, E. Shahan, **K. Chen**, B. Duinkharjav
US Patent 2025 0095232 A1

Research Experience

- 6/’25 – 8/’25 **University of Cambridge | Visiting Scholar**
w/ Prof. Rafal Mantiuk
Working on image/video quality metrics.
- 6/’24 – 1/’25 **Meta Reality Labs, Applied Perception Science | Research Scientist Intern**
w/ Dr. Alex Chapiro
Studied/modelled contrast and luminance preferences in HDR displays.
Developed perceptual tone mapping algorithms for HDR video.
Resulted in a SIGGRAPH 2025 publication.
- 6/’23 – 1/’24 **Meta Reality Labs, Applied Perception Science | Research Scientist Intern**
w/ Dr. Alex Chapiro
Studied the visibility of different display power optimization algorithms in a VR setting.
Measured and modelled power consumption of the Quest Pro display.
Resulted in a SIGGRAPH 2024 paper which won a best paper award, honorable mention.

6/'22 – 8/'22 **Cesium GS** | Research Scientist Intern
w/ *Prof. Norman I. Badler*
Resulted in a poster presentation at SCA 2023.

Teaching

SP 2025 **Data Visualization (CS-GY 6313)**
New York University, Course Assistant

FA 2024 **Virtual and Augmented Reality (CS-GY 9223)**
New York University, Course Assistant

SP 2023 **Data Visualization (CS-GY 6313)**
New York University, Course Assistant

FA 2021 **Interactive Computer Graphics (CS-GY 6533)**
New York University, Course Assistant

SP 2021 **Computer Graphics and Imaging (CS 184)**
UC Berkeley, Undergraduate Student Instructor

FA 2020 **Introduction to Computer Vision and Computational Photography (CS 194-26)**
UC Berkeley, Group Tutor & Reader

Talks

08/2025 **What is HDR? Perceptual Impact of Luminance and Contrast in Immersive Displays**
ACM SIGGRAPH 2025 | Vancouver, Canada

07/2025 **Perceptually-Inspired Algorithms for Power Optimization in XR Displays**
Rainbow Seminar | University of Cambridge
Invited by Prof. Rafal Mantiuk

11/2024 **High-Beams Seminar | University College London (Remote)**
Invited by Prof. Kaan Aksit

08/2024 **PEAPODs: Perceptual Evaluation of Algorithms for Power Optimization in XR Displays**
ACM SIGGRAPH 2024 | Denver, Colorado

12/2022 **Color-Perception-Guided Display Power Reduction for Virtual Reality**
ACM SIGGRAPH Asia 2022 | Daegu, South Korea

Academic Service

2025 Program Committee:
ACM Intelligent User Interfaces (IUI)

Peer Review:

2025	Eurographics
2025	ACM Intelligent User Interfaces (IUI)
2025	IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR)
2025, 2024	ACM Special Interest Group on Computer Graphics (SIGGRAPH)
2025, 2024	ACM Special Interest Group on Computer Graphics Asia (SIGGRAPH Asia)
2025, 2024	IEEE Transactions on Visualization and Computer Graphics (TVCG)

Outreach & Volunteering

2025	Applied Research Innovations in Science and Engineering (ARISE) Program Created summer research outline for high school student researchers at NYU.
2020 – 2021	Innovative Design at Cal <i>Vice President of Technology</i> Led a web development team, provided pro-bono technical services to on-campus orgs.
2018	Special Needs Aquatics Program (SNAP kids) <i>Volunteer Instructor</i> Swim lessons/mobility exercises with special needs children.

Media Coverage

2025	Visual Efficiency for Intel's GPUs <i>Intel Blogs</i>
2024	Immersive Computing Lab teams up with Meta to uncover how energy-saving tactics affect perceived quality of XR experiences. <i>NYU Engineering News</i>