

Kai-En Lin

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Research Interests

Image-based Rendering, Neural Rendering, View Synthesis, and AR/VR.

Education

University of California, San Diego

PH.D. IN COMPUTER SCIENCE

- **Expected Graduation Year:** 2023
- Supported by Qualcomm FMA Fellowship

San Diego, USA

Sept. 2018 - PRESENT

National Taiwan University (NTU)

B.S. IN ELECTRICAL ENGINEERING

- **Dean's List Award (2016 Spring):** Ranked 1st out of 185 students
- **Overall GPA:** 4.12/4.30 (3.94/4.00)

Taipei, Taiwan

Sept. 2013 - June 2017

Research Experience

Google

RESEARCH INTERN

- Project Starline Research Intern
- Research on view synthesis

Mountain View, USA

June 2022 - Sept. 2022

Google

RESEARCH INTERN

- Research on single-image view synthesis
- Paper released on arxiv

Mountain View, USA

June 2021 - Sept. 2021

Facebook Reality Labs

RESEARCH INTERN

- Display Systems Research Intern
- Research on video view synthesis
- Published as a conference paper at ICCV 2021

Seattle, USA

June 2020 - Sept. 2020

Adobe Research

RESEARCH INTERN

- Graphics Intelligence Lab Intern
- Research on 6-DoF panoramic view synthesis
- Published as a conference paper at ECCV 2020

San Jose, USA

June 2019 - Sept. 2019

Center for Visual Computing, UCSD

GRADUATE STUDENT RESEARCHER

- **Advisor:** Prof. Ravi Ramamoorthi
- Research on view synthesis, neural rendering and image-based rendering
- Worked on view synthesis for 360° images based on multi-plane images (MPI)
- Developing and extending neural radiance field (NeRF) to handle portrait view synthesis and relighting

San Diego, USA

Sept. 2018 - PRESENT

Multimedia Processing and Communications Lab, NTU

UNDERGRADUATE RESEARCHER

- **Advisor:** Prof. Homer H. Chen
- Surveyed and implemented a computer vision algorithm, dark channel prior
- Proposed a method for haze removal using augmented reality
- Participated in the light field VR project
- Surveyed and applied the face recognition algorithm, FaceNet, on both PC and mobile platform

Taipei, Taiwan

Jan. 2016 - Dec. 2017

Publications & Presentations

Vision Transformer for NeRF-Based View Synthesis from a Single Input Image

KAI-EN LIN, LIN YEN-CHEN, WEI-SHENG LAI, TSUNG-YI LIN, YI-CHANG SHIH, RAVI RAMAMOORTHY - ARXIV PREPRINT

July 2022

- Introduced a novel representation enabling SOTA performance on single-image view synthesis task.
- Combined vision transformer (ViT) and neural radiance fields (NeRF) to reconstruct appearance in unseen regions

Deep 3D Mask Volume for View Synthesis of Dynamic Scenes

Montreal, Canada

KAI-EN LIN, LEI XIAO, FENG LIU, GUOWEI YANG, RAVI RAMAMOORTHY - INTERNATIONAL CONFERENCE ON COMPUTER VISION (ICCV) 2021

Oct. 2021

- Introduced a 3D mask volume representation to address temporal inconsistency in video view synthesis
- Introduced a new multi-view video dataset

NeLF: Neural Light-transport Field for Portrait View Synthesis and Relighting

Saarbrücken, Germany

TIANCHENG SUN*, KAI-EN LIN*, SAI BI, ZEXIANG XU, RAVI RAMAMOORTHY - EUROGRAPHICS SYMPOSIUM ON RENDERING (EGSR) 2021

June 2021

- Introduced a novel representation, NeLF, for portrait view synthesis and relighting

Deep Multi Depth Panoramas for View Synthesis

Glasgow, United Kingdom

KAI-EN LIN, ZEXIANG XU, BEN MILDENHALL, PRATUL P. SRINIVASAN, YANNICK HOLD-GEOFFROY, STEPHEN DIVERDI, QI SUN, KALYAN

SUNKAVALLI, RAVI RAMAMOORTHY - EUROPEAN CONFERENCE ON COMPUTER VISION (ECCV) 2020

Aug. 2020

- Introduced a novel 3D representation for view synthesis on 360 images

Enhancing the Perception of a Hazy Visual World Using a See-through Head-mounted Device

Beijing, China

KAI-EN LIN, KUANG-TSU SHIH, HOMER CHEN - INTERNATIONAL CONFERENCE ON IMAGE PROCESSING (ICIP) 2017

Sept. 2017

- Introduced a novel method to perform haze removal for augmented reality using the perceptual properties of human visual system

Dehazing With a See-Through Near-Eye Display

San Diego, USA

KUANG-TSU SHIH, KAI-EN LIN, HOMER CHEN - INTERNATIONAL CONFERENCE ON MULTIMEDIA AND EXPO (ICME) 2018

July 2018

- **Best Demo Papers Award:** Demonstrated the implementation of the ICIP paper

Selected Course Projects

Light Field Renderer

FINAL PROJECT OF COMPUTER GRAPHICS II: RENDERING

2020

- Implemented a light field renderer with Python and OpenGL
- Used multitexturing and projective texture to combine multiple views

Convex Optimization in Image Processing

FINAL PROJECT OF CONVEX OPTIMIZATION ALGORITHMS

2019

- Surveyed primal-dual algorithm for solving image processing problems

Non-Local Means Filtering for Monte Carlo Denoising

FINAL PROJECT OF SELECTED TOPICS IN COMPUTER GRAPHICS

2018

- Implemented non-local means filter on Mitsuba for Monte Carlo Denoising

Related Skills

Programming Skills: C++, \LaTeX , MATLAB, Linux, Python

Libraries/Tools: PyTorch, OpenCV, OpenGL