

JUNKAI HUANG

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EDUCATION

Carnegie Mellon University

- Master of Science in Robotics | GPA: 4.17 / 4.33
- Working on high-fidelity, human-centered dynamic 3D reconstruction in real time.
- Advisor: Prof. Fernando De la Torre, Dr. Bernhard Kerbl

Pittsburgh, PA
August 2023 - Present

The Hong Kong University of Science and Technology (HKUST)

- Bachelor of Science in Computer Science and Mathematics | GPA: 3.96 / 4.3
- Teaching Assistant: *Deep Learning Meets Computer Vision* (PG level), *Computer Graphics*
- Selected Awards: Academic Achievement Award, HKSAR Government Scholarship Fund, First Class Honors

Hong Kong
September 2019 - August 2023

PUBLICATIONS

Instance Neural Radiance Field

Yichen Liu*, Benran Hu*, **Junkai Huang***, Yu-Wing Tai, and Chi-Keung Tang
The International Conference on Computer Vision (ICCV), 2023. 📄 Paper. 📺 Video.

(* Equal contribution)

NeRF-RPN: A general framework for object detection in NeRFs

Benran Hu*, **Junkai Huang***, Yichen Liu*, Yu-Wing Tai, and Chi-Keung Tang
The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023. 📄 Paper. 📺 Video.

(* Equal contribution)

- HKUST CSE 2022-2023 Final Year Project Best Demo Award. *Presentation Video*.
- The IEEE (Hong Kong) Final Year Project Competition 2022-2023 Second Runner-up Award.

Harnessing Generative Modeling in Photographic Lighting Design

Christina Yang, **Junkai Huang**, Chengqi(Malia) Hong, Xiaoyu Huang, Freya Young, Qiyu Chen, Nikolas Martelaro
Under review.

SELECTED PROJECTS

Human-centered Large-scale Dynamic 3D Reconstruction

- Developing a new **3D gaussian splatting** based dynamic 3D reconstruction pipeline for large-scale, human-centered sports events and spectacles, towards real-time live broadcast applications. This is an ongoing work intended to be submitted to SIGGRAPH.

CMU | Fall 2023 - Present

DragGaussian: Point-based 3D Gaussian Manipulation

- Proposed a **diffusion model** based 3D gaussian editing method that takes 3D point dragging signals as input, uses 2D supervision to manipulate 3D gaussians. *Webpage*.

CMU | Spring 2024

Photon Mapping - Physics-based Rendering Project

- Implemented the photon mapping rendering algorithm with NEE light sampling, final gathering and caustic photon mapping.
- Technical award winner of the in-class final rendering competition. *Webpage*.

CMU | Spring 2024

WORK EXPERIENCE

Software Engineer Intern - Perception & Pose | Rivian Automotive, Inc | Palo Alto, CA

- Developed the first **3D occupancy prediction** model in Rivian that took camera & lidar inputs. Validated on public and Rivian datasets.
- Improved the 3D point cloud segmentation method and the 3D assets visualization tools.

May 2024 - August 2024

AI Developer Intern | Sebit Company Limited | Hong Kong

- Developed and deployed a customizable YOLOv4 training pipeline using PyTorch, OpenCV, and Jenkins.

June 2022 - August 2022

SKILLS

Programming Languages: Python, C++, C, CUDA, MATLAB, Java, JavaScript

Frameworks and tools: PyTorch, TensorFlow, Git, Linux, Blender, Docker, SolidWorks, Microsoft Azure, \LaTeX

Languages: English (fluent), Mandarin (native)

LEADERSHIP

Deputy Head - HKUST Student Ambassador

2021 - 2023

Project Manager - HKUST ENTERPRIZE RoboMaster Team

2019 - 2021

- Formulated 2021 mechanical team R&D plan and tracked team R&D progress.
- As a mechanical engineer, developed the chassis and suspension system of the Hero Robot (CAD with SolidWorks, manufacturing).