BENRAN HU

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EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Master of Science in Computer Science — *Dec. 2024 (Expected)*

Hong Kong University of Science and Technology — Hong Kong SAR
Bachelor of Science in Data Science and Technology, and in Computer Science — *Jun. 2023*

- Achieved CGA: 4.14/4.30, Major CGA: 4.19/4.30.

PUBLICATIONS

Yichen Liu*, **Benran Hu***, Junkai Huang*, Yu-Wing Tai, and Chi-Keung Tang. Instance Neural Radiance Field. *arXiv preprint arXiv:2304.04395*, 2023. |

Benran Hu*, Junkai Huang*, Yichen Liu*, Yu-Wing Tai, and Chi-Keung Tang. NeRF-RPN: A general framework for object detection in NeRFs. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2023. |

RESEARCH EXPERIENCE

Independent Research — HKUST, Hong Kong SAR
Undergraduate Research Student | Advisor: *Prof. Pedro Sander* — *Sep. 2022 - Present*

- **Shading Reprojection Scheduling:** Maximized rendering quality within performance constraints by scheduling temporal reprojection for tiles based on error prediction.

Independent Research — HKUST, Hong Kong SAR
Undergraduate Research Student | Advisors: *Prof. Chi-Keung Tang* and *Prof. Yu-Wing Tai* — *May. 2022 - Mar. 2023*

- **Object Detection in NeRF [CVPR'23]:**
  - Proposed the first significant 3D object detection method in Neural Radiance Fields (NeRF). |
  - Created the first benchmark dataset for NeRF 3D object detection.
- **NeRF Instance Segmentation [ICCV'23]:**
  Proposed one of the first 3D Instance Segmentation methods in NeRF. |

Independent Research — HKUST, Hong Kong SAR
Undergraduate Research Student | Advisor: *Prof. Pedro Sander* — *Sep. 2021 - Sep. 2022*

- **Perception-Driven Stereo Rendering:** Devised a perception-driven rendering algorithm for VR utilizing binocular fusion and reprojection to improve rendering performance while minimizing visual quality loss.

TECHNICAL PROJECTS

Metarenderer — *Independent Work Advised by Prof. Pedro Sander*

- Developed a rendering playground for introductory graphics courses based on three.js and WebGL, featuring interactive experiments of camera and shading models, lighting, culling, textures, and shadow mapping.
- Implemented PCSS, microfacet materials, and PRT with interreflection and glossy BRDF.
- Used in the teaching of COMP 5411 Advanced Computer Graphics, at HKUST.

Trace — *Course Project of Computer Graphics*

- Implemented a soft renderer supporting path tracing, microfacet materials, and photon mapping.

DEPARTMENTAL SERVICE

Student Helper of Honors Object-Oriented Programming and Data Structures

- Designed a programming assignment on implementing a Git-like version control system and lab exercises.

HONORS & AWARDS

Tse Cheuk Ng Tai Scholarship for students with research achievement in Vision and Graphics *2022*
Lee Hysan Foundation Exchange Scholarship *2021*
Chiaphua Industries Limited Scholarship for Chinese Mainland Undergraduate Students *2021 - 2022*
The Joseph Lau Luen Hung Charitable Trust Scholarship *2020*
University's Scholarship Scheme for Continuing Undergraduate Students *2020 - 2022*
Dean's List *2019 - 2022*