LIU YICHEN

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The Hong Kong University of Science and Technology

EDUCATION

The Hong Kong University of Science and Technology(HKUST) *Sep 2023 - Now*
Master of Philosophy in Computer Science and Engineering

- CGA: 4.0/4.3
- My supervisors are Prof. Chi Keung Tang and Prof. Yu Wing Tai

The Hong Kong University of Science and Technology(HKUST) *Sep 2019 - Jun 2023*
Bachelor of Computer Science and Mathematics in General Mathematics Track (double majors)

- Major CGA:3.85/4.3 CGA: 3.74/4.3.
- First Class Honors.
- I conducted three research projects.

National University of Singapore(NUS) *Jan 2022 - May 2022*
School Exchange Program

AWARD AND SCHOLARSHIP

- **Second Runner-up of IEEE (HK) Computational Intelligence Chapter FYP & PG Competition 2022-2023**
- **the University's Scholarship Scheme for Continuing Undergraduate Students in the 2020/21 academic year**
- **the University's Scholarship Scheme for Continuing Undergraduate Students in the 2021/22 academic year**
- **HKUST Study Abroad Sponsorship 2021/22**
- **Dean's List of 2019-20 Fall**
- **Dean's List of 2020-21 Fall**
- **Dean's List of 2021-22 Fall**

PUBLICATION

SANeRF-HQ: Segment Anything for NeRF in High Quality.
Yichen Liu, Benran Hu, Chi-Keung Tang, Yu-Wing Tai.
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024. [arXiv link]

Instance Neural Radiance Field.
Yichen Liu*, Benran Hu*, Junkai Huang*, Yu-Wing Tai, Chi-Keung Tang.
* *indicates Equal contribution*
International Conference on Computer Vision (ICCV), 2023. [arXiv link]

NeRF-RPN: A general framework for object detection in NeRF.
Benran Hu*, Junkai Huang*, Yichen Liu*, Yu-Wing Tai, Chi-Keung Tang.
* *indicates Equal contribution*(I am one of the first co-authors)
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023. [arXiv link]

ONeRF: Unsupervised 3D Object Segmentation from Multiple Views
Shengnan Liang*, Yichen Liu*, Shangzhe Wu, Yu-Wing Tai, Chi-Keung Tang.
* *indicates Equal contribution*(I am one of the first co-authors)
arXiv pre-print. [arXiv link]

RESEARCH AND PROJECTS

SANeRF-HQ: Segment Anything for NeRF in High Quality. *HKUST, May 2023 - Nov 2023*

- MPhil project in HKUST, advised by Prof.Chi Keung Tang and Prof.Yu Wing Tai
- We propose SANeRF-HQ, a pipeline to achieve zero-shot 3D segmentation in Neural Radiance Field(NeRF). Provided with a pre-trained NeRF and user prompts, our method can segment the target object(s) in 3D, represented by NeRF.
- I finished most of the project myself, ranging from implementation and experiment conduction to paper writing and demonstrations.
- The paper is under review. [paper link][project page]

Instance Neural Radiance Field *HKUST, Jan 2023 - March 2023*

- Extension of my final year project year project(HKUST), advised by Prof.Chi Keung Tang and Prof.Yu Wing Tai
- We introduce the task of 3D object segmentation in nerual radiance field(NeRF) and propose the one of the first pipelines. Given a pre-trained NeRF of a scene, our target is to predict the 3D segmentation of all objects, represented by NeRF.
- This project is finished by three undergraduate students and we equally contribute to our project. I involved in the coding of our baseline, especially the 2D mask refinement and rendering, and conducted half of the ablation studying. Also, I completed most of the paper writing.
- The paper is accepted by ICCV2023. [paper link] [code][demo video]

NeRF-RPN: A general framework for object detection in NeRFs *HKUST, May 2022 - Nov 2022*

- Final year project advised by Prof. Chi Keung Tang and Prof. Yu Wing Tai
- We introduce the task of 3D object detection in nerual radiance field(NeRF) and propose the first region proposal network(RPN) in 3D space based on the NeRF representation, called NeRF-RPN. Given a pre-trained NeRF of a scene, NeRF-RPN predict all 3D object-oriented bounding boxes of objects in it.
- This project is finished by three undergraduate students and we equally contribute to our project. All of us involved in the coding, experiment and paper writing. I conducted the dataset preparation of Hypersim and involved in the manual data selection of the other two. In the technical section, I coded our initial baseline and explored the possible improvement methods. Additonally, I involved in the paper writing.
- This paper is accepted by CVPR2023. [paper link] [code][demo video]

Rust Interpreter *NUS, Jan 2022 - April 2022*

- Using TypeScript, I implemented an interpreter and a type checker for a subset of Rust.
- The subset includes the basic data types(int32, f32, Array, Tuple, Struct), control flow, function, etc. and some main feature of Rust, which are borrowing& referencing, smart pointer(and a heap).
- Project link: `https://github.com/lyclyc52/Rust_interpreter`

ONeRF: Unsupervised 3D Object Segmentation from Multiple Views *HKUST, July 2021 - Nov 2021*

- Independent work advised by Shangzhe Wu, Professor Chi Keung Tang and Yu Wing Tai
- The project is about unsupervised object segmentation in 3D. Given a multi-view images of a scene, we propose a pipline to abstract the objects unsupervisedly in 3D. Each object is represented by a Neural Radiance Field(NeRF).
- This project is finished by two undergraduate students and we equally contribute to our project. I coded most of the pipeline and finished most of the writing.
- We put our paper on arVix. [paper link]
- Thanks to Xinhang, our method was improved and his paper has been accepted by NeurIPS 2022. See this link

Computer Graphics Course Project *HKUST, Jan 2021 - May 2021*

- Using C++, opengl, fltk, we finished 4 projects related to different computer graphics topics. The projects are
  - Project 1: Impressionist: An interactive impressionistic paint system

  - Project 2: Modeler: A viewer and a hierarchical articulated robot
  - Project 3: Trace: A program to create photo-realistic ray traced images with shadows, reflections, etc.
  - Project 4: Animator: An extension of project 2, including animation curves and particle system
- We extended the projects and coded extra algorithm, such as image matting, metal ball, CSG, light field.
- Project link: https:github.com/lyclyc52/COMP4411-course-project

EXTRACURRICULAR

Robomaster Robotic Competition *Nov 2019 - Aug 2020*

- Our team designed robots for the RoboMaster University Series (RMU)
- I worked as a hardware teammate. My work included design and test of PCB board and wiring of robots.

Peer Mentor Program *Aug 2020 - Dec 2020*

- help new students to adapt university life

INTERNSHIP

Hexagon *June 2022 - Aug 2022*

- I involved in front end and back end development of a measuring tool management system, using Vue and C#.
- I involved in works related to computer vision in a project of automated defect detecting, which included classifying images of electronics, measuring length and detecting defects.