Renyun Li

929-599-8356 rl4210@nyu.edu linkedin.com/in/Renyun Li renyunli0116.github.io

Education

New York University ***Advisor Yao Wang*** **Sep. 2021 – May. 2023**

MS in Computer Engineering Focusing on DL, CV, 3D Point Cloud

Tsinghua University ***Advisor Jianyu Chen*** **May. 2021 – Sep. 2021**

Visiting Scholar in IIIS Focusing on RL, Autonomous Driving, SLAM

Tianjin University ***Advisor Tiegen Liu*** **Sep. 2016 – May. 2020**

BS in EECS Focusing on SLAM, Robotics, ML, Optics

Technical Skills

Languages: Python, C++
Field: CV, RL, SLAM, 3D Point Cloud, ROS, Embedded System, DSP
Tools: Linux, PyTorch, HPC, GCP, AWS, Apollo, CARLA, Unreal, CUDA, OpenACC, FFmpeg

Experience

Chinese Institute for Brain Research **May 2024 – Present**

Machine Learning Engineering

- Working on 3D Face Reconstruction for human and marmoset. Design the pipeline to detect and crop the specific faces from video, and generate the 3D facial model with Part Re-projection Distance Loss.

New York University **June 2023 – May 2024**

Deep Learning Researcher

- Designed a PointNet-based model with a dynamic kernel and multiple frames as input, and infused with motion estimation for 3D point cloud segmentation, paving the way for the compression of 3D video based on this.
- Created 3D point cloud augmentation algorithm, performed Human part segmentation on the dataset generated from 4D FAUST with **97%** acc, **generalized** to unknown subjects and actions with loose-fitting clothes and intricate hair.
- Refine the seg result with motion estimation in a GOP. By utilizing the prediction of the current frame, searched for related parts in the next frame and computed the rigid transformation by ICP local matching. Through dynamic splitting and merging, got each voxel prediction, and then compressed the whole video by Huffman Coding.

Georgia Institute of Technology **Feb 2024 – May 2024**

Researcher Intern

- Proposed NeRF-guided Dataset Distillation (NeRD) strategy to maximize informational uniqueness with data-efficient NeRF pipelines and data-NeRF co-design methods. Conducted empirical validation demonstrating NeRD's effectiveness in enhancing the balance between dataset compression and rendering quality.
- Aishani Singh*, Jason Zhang*, **Renyun Li***, Yonggan Fu. "Condensing 3D Datasets for Enhanced Data Efficiency in 3D Reconstruction", to appear at ISCA Workshop (Emerging Vision and Graphics Systems and Architectures), 2024

Shanghai Qizhi Institute **June 2021 – Sep. 2021**

Deep Learning Research Intern

- Generated a virtual environment based on ROS, Webots Turtlebot3, and Gazebo, and trained a robot car to explore the environment without collision using **RL**, while also reconstructing the map using **Lidar-SLAM**.
- Created an **Autonomous Driving** model consisting of Deep Imitation Learning trajectory planner and safety tracking controller, achieved 6.5 and 8.2 km/infraction desperately in the open and close loop evaluation on **CARLA**.

NXP Semiconductors **Jan. 2021 – June 2021**

Software Engineer Intern

- Engaged in AIoT, TinyML, Visual-SLAM on Embedded Systems with software-hardware co-design.
- Besides optimizing the extraction and matching algorithm of **ORB-SLAM**, leveraged the NXP LS1028 development board's memory hierarchy for efficient multicore utilization and minimized memory allocations through parallelization. This allowed for the efficient reconstruction of **3D point clouds** of the environment by a monocular camera and **ROS**.

Projects

Bridging 2D Segmentation to Empower 3D Scene Understanding **Aug. 2023**

- Rendered 3D objects into 2D images through Pointersect, which would generate different views of the 3D objects. Then segmented the 2D images to generate the predicted label and obtain predicted segmentation masks.
- Propagated the predicted 2D segmentation labels back into the 3D scene by NeRFs and generated a coarse estimate of semantic labels for 3D scenes based on the propagated labels from the inverse rendering process.

Honors and Awards

* NYU CS-GY 6953 Deep Learning TA, with Chinmay Hegde
* 2 papers in IEEE/SCI, 5 patents, 33 honors or awards during undergraduate
* Student Science Award (The youngest candidate of 10 students in all undergraduate, MS and PhD)
* First Prize of China Undergraduate Physics Tournament (ranking 5/63), 2018 News
* Special Prize of Chinese National Undergrad Challenge Cup (top 1%), 2019 Poster
* Outstanding Graduate in Tianjin University(top 5%)