Renyun Li

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Education

Purdue University ***Advisor Amy R. Reibman*** **Aug. 2024 – May. 2028**
PhD student in ECE *Focusing on 3D Vision, 3D Point Cloud*

New York University ***Advisor Yao Wang*** **Sep. 2021 – May. 2023**
MS in ECE *Focusing on 3D Point Cloud Segmentation and Compression*

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, DL, 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 – Jul. 2024**
Machine Learning Engineer
- Developed a neural speech decoding framework using DL and differentiable speech synthesis for natural-sounding speech, achieved PCC of 0.8 with ResNet and Swin Transformer models for ECoG-based speech decoding.
- Advanced right-hemisphere decoding, expanding prosthetic applications for left-hemisphere damage, and optimized decoding for low-density ECoG grids to simplify clinical use.

fAIshion **Feb 2024 – Jul. 2024**
Co-Founder
- Took charge of AI and part of SDE task. Worked on 3D Diffusion Model for virtual try-on catering to diverse body types, ages, and races, and designed the web and Chrome extension.
- Requested the user to upload images to pre-reconstruct mesh by 3D Gaussian Splatting. This allowed right-clicking the listed brand's model for instant try-ons and size recommendations based on diffusion model and volume estimation.

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. 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) 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 compression and rendering quality.
- Aishani Singh*, Jason Zhang*, **Renyun Li***, Yonggan Fu, Yingyan (Celine) Lin. Condensing 3D Datasets for Enhanced Data Efficiency in 3D Reconstruction, ISCA Workshop, 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.

NXP Semiconductors **Jan. 2021 – June 2021**
Software Engineer Intern
- Engaged in AIoT, TinyML, Visual-SLAM on Embedded Systems with software-hardware co-design.
- 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.

Honors and Awards

- 2 papers in IEEE/SCI, 5 patents, 33 honors or awards during undergraduate as Outstanding Graduate (top 5%)
- 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