Lu CHEN

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BIOGRAPHY

The Hong Kong Polytechnic University　　　　　　　　　　　　　　　　**2020 - 2022**
MS.Eng *in Information Technology*　　　　　　　　　　　　　　　　　　　　*Hong Kong*
- Project: *Instance Segmentation in 3D Space Based on Deep Neural Network*
- Advisor: Prof. Bo Yang (Visual Learning and Reasoning, vLAR)

Inner-Mongolia University　　　　　　　　　　　　　　　　　　　　　　**2015 - 2019**
BS.Eng *in Software Engineering*　　　　　　　　　　　　　　　　　　　*Hohhot, China*
- Thesis: *Mutation testing based test data optimized generation method for RESTful web service*
- Advisor: Prof. Jing Liu

PUBLICATION

1. Bing Wang, **Lu Chen***, Bo Yang, "DM-NeRF: 3D Scene Geometry Decomposition and Manipulation from 2D Images"　International Conference on Learning Representations, ***ICLR 2023***. [Paper] [Code]

Attn: *: Equal contribution, †: Corresponding Author

Can reference the conferences Influence from Google Scholar

WORK EXPERIENCES

3D City Reconstruction Optimization Based on NeRF　　　　　　　**Sep. 2022 – Now**
Computer Vision Algorithm Engineer　　　　　　　　　　*The Shanghai Nullmax(AI) Company*
- Disassembled most of Plenoxels' codes and have already reconstructed a crossroad scene by using two trajectories and 6 cameras around the car.
- Add a depth loss described by Urban Radiance Field(Urban NeRF) to optimize the result of reconstruction.

RESEARCH PROJECTS

City 3D Reconstruction with Lidar Signal Supervised Based on Multi-View　　**Aug. 2022 - Now**
Computer Vision Algorithm Engineer　　　　　　　　　　　　　　*Nullmax(AI) Company*
- Utilized real time rendering technology and deep learning to reconstruct open road world.
- Sample Gaussian Distribution for each ray to constraint depth information, then, got the most precise depth map and more complete 3D building mesh of point cloud.

3D Scene Geometry Decomposition and Manipulation from 2D Images　**May. 2021 - Aug. 2022**
Co-first Author, All Coding Work　　　　　　　　　　　　　　　　　*PolyU, vLAR Group*
- Introduced an object field component to learn unique codes for all individual objects in 3D space only from 2D supervision based on neural radiance fields (NeRF).
- Designed loss functions to enable every 3D point, especially in non-occupied space, optimized even without 3D labels.
- Introduced an inverse query algorithm to freely manipulate any specified 3D object shape in the learned scene representation (manipulation includes translation, scale up, scale down, object self rotation, deformable etc.).
- Created and rendered a new dataset named **DM-SR** by Blender software.

Pre-trained Language Models for Modeling Machine Comprehension　**Sep. 2020 - Mar. 2021**
Group Leader　　　　　　　　　　　　　　　　　　　　　　　　　　*PolyU, vLAR Group*
- Tested on three reading comprehension datasets MCTest, RACE, and Dream through pre-trained BERT and XLNet.
- Leveraged a multi-task learning strategy, finetune the XLNet model on the DREAM and RACE datasets at the same time, achieving a 5.88% improvement.

Reproduce Articles Related to NeRF　　　　　　　　　　　　　　**Sep. 2020 - Now**
Research Assistant
- Plenoxels: Radiance Fields without Neural Networks.(CVPR 2022)
- Panoptic NeRF: 3D-to-2D Label Transfer for Panoptic Urban Scene Segmentation.(3DV 2022)
- Urban Urban Radiance Fields.(CVPR 2022)

TECHNICAL SKILLS

Languages: Python, CUDA C, C++, Java, HTML/CSS, JavaScript
Developer Tools: VS Code, PyCharm, Eclipse, Google Cloud Platform, Android Studio
Technologies/Frameworks: Linux, Jenkins, GitHub, Pytorch, Tensorflow