

XIYU ZHANG

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🎓 EDUCATION

Zhejiang University, CKC, Hangzhou, China

2019 – Expected Mar. 2023

Major in Artificial Intelligence (AI)

GPA: 3.84/4 (or 88.22/100)

👥 EXPERIENCE

Introduction to Computer Vision Project

Nov. 2021 – Dec. 2022

Python

In this project, we completed three subtasks Camera Localization, Depth Estimation, and Semantic Segmentation on 10 testing photos using given 61 photos of Mengminwei Building in Zhejiang University.

Camera Localization

First, we use COLMAP to build a sparse model with 61 given photos and camera parameters. After that, we can establish a 3D-2D relationship between the points in the model and the pixels in the picture. Then we use feature matching methods such as SIFT or other neural network-based methods like LoFTR to obtain the 2D-2D correspondence between the query image and the database image, and obtain the 3D-2D relationship between 3D points and pixels in the query image. And in the end, we directly use Hierarchical-Localization based on Super-Point and Super-Glue to get the camera poses.

Depth Estimation

Our depth estimation is based on COLMAP. We have also tried using neural-based MVS methods like MVSnet, CasMVSNet to get a more refined model, but there are still many missing values and need to be completed. We have used several interpolation methods or depth completion methods, but none of them can achieve better results than the combination of the depth map predicted by the monocular depth estimation network and the COLMAP depth map.

Semantic Segmentation

We used several pretrained models based on large-scale datasets and relabeled the outputs. Then we use an ensemble approach to combine several models and weight them. We found that the network resizes the images, so before we feed the images to the network, we first cut them into small pieces and we end up with 0.64 IoU

⚙️ COURSE AND SKILLS

Course: Machine Learning

Sep. 2020 – Jan. 2021

Python, PyTorch

There are six assignments in this course, and we implemented SVM, KNN, PCA, Decision Tree using Python, and used PyTorch to implement Deep Q-Learning on CartPole-v0(OpenAI Gym),

Course: Introduction to Computer Vision

Sep. 2021 – Jan. 2022

Python, PyTorch

In this course, we learned about image processing, structure from motion, depth estimation, 3D reconstruction, and some tasks like semantic segmentation, and object detection.

Skills

- Programming Languages: Python > C > C++
- Deep Learning Framework: PyTorch

♡ HONORS AND AWARDS

<i>2nd Prize</i> , The Chinese Mathematics Competitions(Non-Mathematics)	Dec. 2020
<i>3rd Prize</i> , Zhejiang University Scholarship	Jan. 2021
<i>3rd Prize</i> , Zhejiang University Scholarship	Dec. 2021