Liu Zihua   Tokyo, Japan

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HomePage: https://magicboomliu.github.io/
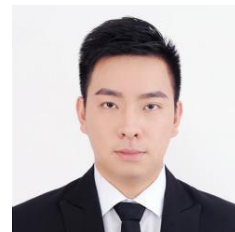
Education & Awards

Undergraduate：South China University of Technology (SCUT) 985&211   2016/09-2020/06

Major: Information and Interactive design   Bachelor of Engineering | GPA 3.78/4.00   Avg.Grade   90.24 / 100
South China University of Technology Scholarship   2019 /12

Master ：Tokyo Institute of Technology(TiTech)   2021/04-2023/03

Major: System Control and Engineering   Okutomi & Tanaka Computer Vision and Image processing Lab

Master of Engineering | GPA 4.00/4.50 (Top5%)   Avg.Grade 95.6/100
Tokyo Institute of Technology Outstanding Thesis Award.   2023 /03
SCIE Award(The Society of Instrument and Control Engineering).   2023/03
Tokyo Tech Advanced Human Resource Development Fellowship.   2023~2026

Ph.D candiates: Tokyo Institute of Technology(TiTech)   2023/03-2026/03

Publications

1. *Digging Into Normal Incorporated Stereo Matching*, ACM International Conference on Multimedia(ACMMM 2022).
 Zihua Liu, Songyan Zhang, Zicheng Wang and Masatoshi Okutomi.

2. *Global Occlusion-Aware Transformer for Robust Stereo Matching.* Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision(WACV 2024)
Zihua Liu, Yizhou Li and Masatoshi Okutomi.

3. CFDNet: A Generalizable Foggy Stereo Matching Network with Contrastive Feature Distillation. International Conference on Robotics and Automation (ICRA2024)
Zihua Liu, Yizhou Li and Masatoshi Okutomi.

4. VSRD: Volumetric Silhouette Rendering for Weakly Supervised 3D Object Detection. Proceedings of the IEEE/CVF Computer Vision and Pattern Recognition. (CVPR 2024)
Zihua Liu*, Hiroki Sakuma*, Masatoshi Okutomi (Equal Contribution)

Internship Experience

1.Senstime Japan.   Tokyo   2023/06~2023/11
Position: Computer Vision Internship.
As a researcher intern, we developed VSRD, a novel method for monocular 3D object detection with weak 2D supervision, avoiding the need for 3D labels. Our approach utilizes multi-view 3D auto-labeling to generate pseudo labels for training. We introduce an Instance-aware volumetric silhouette rendering to create instance masks from a signed distance field (SDF) representation of objects. For optimizing 3D bounding boxes directly, we decompose each object's SDF into a basic cuboid SDF and a residual distance field (RDF), enabling end-to-end optimization by aligning rendered and actual instance masks.
The Paper has been accepted for Conference of Computer Vision and Pattern Recognition.(CVPR2024)

2. Megvii Shanghai Research Institue.   Shanghai   2022/02~2022/04
Position: Computer Vision Internship.
(1) Focus on Parking Slot detection and segmentation for autonomous driving.
(2) Add a angle constrain to the corners of the parking slot which improve the recall rate of parking slot detection by 10%.
(3) Impose a novel training strategy for data augmentation which make full use of the limited training data, which greatly improve the detection at ill-position like image edges and occluded regions. It was finally accepted by Megvii as the IPM pipeline for automatic parking algorithm.

3. Machine Perception and Intelligence LAB of Peking University.   Beijing
Position: Research Assistant(RA).   2019 /08-2019/10
- Completed the study of Face Value Prediction and Migration Based on GAN, and proposed an Encoder-GANs noise space image location method. By adding LBP feature constraints when performing face value migration to avoid a large amount of loss of features during face value migration. This model achieves better classification results in CeleBA and SCUT-FBP5500 dataset.

4.PixelShift.AI.   Shanghai
Position: Algorithm Engineer Internship.   2020/10-2021/02
- Based on the Google Mediapipe platform, build an Andriod mobile and web AR solution for art toy. Participate in the research and development of *ZOO* AR camera, use Google KNIFT key point matching algorithm to take place of ORB and SIFT to obtain better AR tracking effect.
- Responsible for the algorithm design and research of the lip sync matching solution of the mobile AR virtual character VRM model. Construct a lightweight solution for lip matching based on MFCC features based on shallow MLP and SVM and obtained accurate lip motion data feedback.

Language Skills

English: CET-6 580 | TOFEL 91   Japanese：JPLT N1 131

Academic Services

I serve as a reviewer for International conferences including NeruIPS, ACMMM, BMVC, etc.

Professional Skills.

- Proficient in Python scientific programming, have a good command of using Pytorch for model design and reproduction.
- Proficient in Computer Vision algorithms based on multi-view geometry and deep learning, familiar with and reproduce the CNNs and Transformer based methods. Have a deep understanding of the research and development of 3D vision task algorithms(Stereo Matching, Optical Flow Estimation, SFM).
- Familiar with the diffusion models including the DDPM and Stable Diffusion.
- Familar with the differential rendering techniques such as NeRF, 3DGS and Diffusion-based novel view synthesis.
- Understand the basis of the CUDA and C++ based pytorch-extension programing.
- Familar with Linux, Git, Accelrate, Docker operation.
- Have strong mathematical analysis and paper writing skills, good at communication, good at teamwork and coordinated research.