Linghao Chen

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Education

2015–2019 **Bachelor in Computer Science and English (dual-degree)**, *Zhejiang University*.
GPA: 89.0/100

2019–2024 **Ph.D. in Computer Science**, *Zhejiang University*, Advised by Prof. Xiaowei Zhou.
GPA: 89.9/100

2022–2023 **Visiting Ph.D.**, *UC San Diego*, Advised by Prof. Hao Su.

Award Experiences

2017 First-class Scholarship of ZJU

2019 Postgraduate Scholarship of ZJU

2021 The Most Academic Value Award of Zhejiang University Doctoral Conference Forum

2021 Second Prize of Artificial Intelligence Innovation Competition

2020 Excellent and Miyoshi Postgraduate

2019 Excellent graduation thesis

2018 Full marks in PAT Level-A

2016,2018 Second-class Scholarship of Zhejiang University

2016 The Third Prize of the National College Student Mathematics Competition

2016 Mathematics Modeling S Prize

Selected Publications

CVPR 2020, TPAMI 2021 **Disp R-CNN: Stereo 3D Object Detection via Shape Prior Guided Instance Disparity Estimation**.
Proposed a 3D object detection pipeline that estimates instance-level disparity maps on individual objects. This design guides the network to learn the category-level object shape prior for better disparity estimation and 3D object detection. Even when LiDAR ground truth is not available at training time, Disp R-CNN outperforms previous state-of-the-art methods by 20% in terms of average precision.

CVPR 2021 (Oral) **NeuralRecon: Real-time Coherent 3D Reconstruction with Monocular Video**.
Proposed the first learning-based pipeline that reconstructs 3D scene geometry from a monocular video in real-time. Unlike previous methods that estimate single-view depth maps and perform TSDF fusion later, NeuralRecon jointly reconstructs and fuses local surfaces directly in the sparse volumetric TSDF representation. This design allows the network to capture local smoothness prior and global shape prior of 3D surfaces, resulting in accurate and coherent surface reconstruction. NeuralRecon generalizes well to new data domains and is able to reconstruct large-scale 3D scenes on a laptop GPU in 33 keyframes per second.

RA-L 2023, ICRA 2024 **EasyHeC: Accurate and Automatic Hand-eye Calibration via Differentiable Rendering and Space Exploration**.

Introduced a new approach to hand-eye calibration called EasyHeC, which is markerless, white-box, and offers comprehensive coverage of positioning accuracy across the entire robot configuration space. We introduce two key technologies: differentiable rendering-based camera pose optimization and consistency-based joint space exploration, which enables accurate end-to-end optimization of the calibration process and eliminates the need for the laborious manual design of robot joint poses. EasyHeC enhances downstream manipulation tasks by providing precise camera poses for locating and interacting with objects.

CVPR 2024 **One-2-3-45++: Fast Single Image to 3D Objects with Consistent Multi-View Generation and 3D Diffusion**.

present an innovative method that transforms a single image into a detailed 3D textured mesh in approximately one minute. Our approach aims to fully harness the extensive knowledge embedded in 2D diffusion models and priors from valuable yet limited 3D data. This is achieved by initially fine-tuning a 2D diffusion model for consistent multi-view image generation, followed by elevating these images to 3D with the aid of multi-view conditioned 3D native diffusion models. Extensive experimental evaluations demonstrate that our method can produce high-quality, diverse 3D assets that closely mirror the original input image.

NeuRIPS 2023 **OpenIllumination: A Multi-Illumination Dataset for Inverse Rendering Evaluation on Real Objects**.

Introduced OpenIllumination, a real-world dataset containing over 108K images of 64 objects with diverse materials, captured under 72 camera views and a large number of different illuminations. For each image in the dataset, we provide accurate camera parameters, illumination ground truth, and foreground segmentation masks. Our dataset enables the quantitative evaluation of most inverse rendering and material decomposition methods for real objects. We examine several state-of-the-art inverse rendering methods on our dataset and compare their performances.

Work Experiences

2019–2022 **Technical Secretary**, *GAMES (Graphics And Mixed Environment Seminar)*.

Managing live-streaming of GAMES Webinar and GAMES Courses. Maintainer of the official website and Bilibili account of GAMES.

Skills

Programming Python, C/C++, JavaScript/HTML/CSS, LaTeX

Library PyTorch, TensorFlow

English TEM-4 (Good), TOFEL (103), CET-6 (606)

Designing Blender, Unity

Service

- Conference reviewer: ICCV, CVPR, ECCV, AAAI, SIGGRAPH, IJCAI, IEEE RA-L, ICRA, PRCV, CVM

Publication List

* denotes equal contribution.

Joural Papers

[1] **Linghao Chen***, Jiaming Sun*, Yiming Xie, Siyu Zhang, Qing Shuai, Qinhong Jiang, Guofeng Zhang, Hujun Bao, and Xiaowei Zhou. Shape Prior Guided Instance Disparity Estimation for 3D Object Detection. ***T-PAMI***, 2021.

[2] **Linghao Chen**, Yuzhe Qin, Xiaowei Zhou, and Hao Su. Easyhec: Accurate and automatic hand-eye calibration via differentiable rendering and space exploration. ***RA-L***, 2023.

Conference Papers (Peer-reviewed)

[3] Jiaming Sun*, **Linghao Chen***, Yiming Xie, Siyu Zhang, Qinhong Jiang, Xiaowei Zhou, and Hujun Bao. Disp R-CNN: Stereo 3D Object Detection via Shape Prior Guided Instance Disparity Estimation. ***CVPR***, 2020.

[4] **Linghao Chen**, Yunzhou Song, Hujun Bao, and Xiaowei Zhou. Perceiving Unseen 3D Objects by Poking. ***ICRA***, 2023.

[5] Jiaming Sun*, Yiming Xie*, **Linghao Chen**, Xiaowei Zhou, and Hujun Bao. NeuralRecon: Real-Time Coherent 3D Reconstruction from Monocular Video. ***CVPR***, 2021. **Oral presentation** and **Best paper candidate**.

[6] Minghua Liu, chong Zeng, Xinyue Wei, Ruoxi Shi, **Linghao Chen**, Chao Xu, Mengqi Zhang, Zhaoning Wang, Xiaoshuai Zhang, Isabella Liu, Hongzhi Wu, and Hao Su. Meshformer: High-quality mesh generation with 3d-guided reconstruction model. ***NeurIPS***, 2024. **Oral presentation**.

[7] Chao Xu, Ang Li, **Linghao Chen**, Yulin Liu, Ruoxi Shi, Hao Su, and Minghua Liu. Sparp: Fast 3d object reconstruction and pose estimation from sparse views. ***ECCV***, 2025.

[8] Zhengdong Hong, Kangfu Zheng, and **Linghao Chen**. Easyhec++: Fully automatic hand-eye calibration with pretrained image models. ***IROS***, 2024.

[9] Minghua Liu*, Ruoxi Shi*, **Linghao Chen***, Zhuoyang Zhang*, Chao Xu*, Xinyue Wei, Hansheng Chen, Chong Zeng, Jiayuan Gu, and Hao Su. One-2-3-45++: Fast single image to 3d objects with consistent multi-view generation and 3d diffusion. ***CVPR***, 2024.

[10] Isabella Liu*, **Linghao Chen***, Ziyang Fu, Liwen Wu, Haian Jin, Zhong Li, Chin Ming Ryan Wong, Yi Xu, Ravi Ramamoorthi, Zexiang Xu, and Hao Su. Openillumination: A multi-illumination dataset for inverse rendering evaluation on real objects. ***NeurIPS***, 2023.

[11] Minghua Liu*, Chao Xu*, Haian Jin*, **Linghao Chen***, Mukund Varma T, Xu Zexiang, and Hao Su. One-2-3-45: Generalizable single image to 3d mesh in 45 seconds. ***NeurIPS***, 2023.

[12] Jiaming Sun*, Yiming Xie*, Siyu Zhang, **Linghao Chen**, Guofeng Zhang, Hujun Bao, and Xiaowei Zhou. You Don't Only Look Once: Constructing-Spatial-Temporal-Memory-for Integrated 3D Object Detection. ***ICCV***, 2021.