JINGBO ZHANG

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INTRODUCTION

I am a senior Ph.D. student at the City University of Hong Kong, advised by Prof. Jing Liao. My research primarily focuses on various aspects of 3D/4D reconstruction and generation, 2D/3D inpainting, textual optimization, and neural rendering. Recently, we have been fortunate to witness the remarkable success of neural radiance fields (NeRF) and 3D Gaussian Splatting (3DGS) in reconstructing highly detailed and complex 3D/4D scenes. The emergence of powerful generative models, such as diffusion models, has opened up new possibilities for creating incredibly realistic 3D and even 4D worlds, almost as effortless as falling off a log. Currently, my research revolves around NeRF and 3DGS representations, covering areas such as 3D/4D reconstruction and generation, 3D scene editing, depth estimation, and material decomposition.

EDUCATION

Sep.2020-Now	**Department of Computer Science and Technology, City University of Hong Kong (CityU), Hong Kong**
	Supervised by **Prof. Jing Liao**
	Ph.D. Candidate in Computer Science and Technology
Sep.2018-Mar.2020	**School of Automation Science and Electrical Engineering, Beihang University (BUAA), Beijing, China**
	Ph.D. Candidate in Pattern Recognition and Intelligent System
	(Quitted after the 1st year)
Sep.2013-Jul.2018	**School of Aeronautic Science and Engineering, Beihang University, Beijing, China**
	B.A.in Engineering Mechanics
Sep.2015-Jul.2018	**School of Economics and Management, Beihang University (Dual Degree)**
	B.A.in Business Administration

PUBLICATIONS

- **Jingbo Zhang**, Xiaoyu Li, Hongliang Zhong, Qi Zhang, et al. HumanRef-GS: Image-to-3D Human Generation with Reference-Guided Diffusion and 3D Gaussian Splatting[J]. IEEE Transactions on Circuits and Systems for Video Technology, 2024. (Under Review)
- Hongliang Zhong, Can Wang, **Jingbo Zhang**, Jing Liao. Generative Object Insertion in Gaussian Splatting with a Multi-View Diffusion Model[J]. Visual Informatics, 2024. (Under Review)
- Xiaoyu Li, Qi Zhang, Di Kang, Weihao Cheng, Yiming Gao, **Jingbo Zhang**, et al. Advances in 3D Generation: A Survey[J]. arXiv preprint arXiv:2401.17807, 2024. (Under Review)
- Jichao Zhang, Xiaoyu Li, **Jingbo Zhang**, Hao Tang, Jing Liao, Nicu Sebe. A Multi-Task Framework for Controllable 3D Human Generation[J]. International Journal of Computer Vision, 2024. (Under Review)
- Ziyu Wan, **Jingbo Zhang**, Dongdong Chen, Jing Liao. High-Fidelity and Efficient Pluralistic Image Completion with Transformers[J]. IEEE Transactions on Pattern Analysis and Machine Intelligence. 2024.
- **Jingbo Zhang**, Xiaoyu Li, Qi Zhang, et al. HumanRef: Single Image to 3D Human Generation via Reference-Guided Diffusion[C]. Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2024.
- **Jingbo Zhang**, Xiaoyu Li, Ziyu Wan, Can Wang, Jing Liao. Text2nerf: Text-driven 3d scene generation with neural radiance fields[J]. IEEE Transactions on Visualization and Computer Graphics, 2024.
- Hongliang Zhong, **Jingbo Zhang**, Jing Liao. VQ-NeRF: Neural Reflectance Decomposition and Editing with Vector Quantization[J]. IEEE Transactions on Visualization and Computer Graphics, 2023.
- Ruixiang Jiang, Can Wang, **Jingbo Zhang**, et al. AvatarCraft: Transforming text into neural human avatars with parameterized shape and pose control[C]. IEEE/CVF International Conference on Computer Vision. 2023: 14371-14382.
- **Jingbo Zhang**, Xiaoyu Li, Ziyu Wan, Jing Liao. FDNeRF: Few-shot dynamic neural radiance fields for face reconstruction and expression editing[C]. SIGGRAPH Asia 2022 Conference Papers. 2022: 1-9.
- **Jingbo Zhang**, Ziyu Wan, Jing Liao. Adaptive joint optimization for 3D reconstruction with differentiable rendering[J]. IEEE Transactions on Visualization and Computer Graphics, 2022.

- Ziyu Wan, **Jingbo Zhang**, Dongdong Chen, Jing Liao. High-fidelity pluralistic image completion with transformers[C]. IEEE/CVF International Conference on Computer Vision. 2021: 4692-4701.
- Yang Li, **Jingbo Zhang**, Weigang Cui, Heng Yuan, and Hualiang Wei. A multiple beta wavelet-based locally regularized ultra-orthogonal forward regression algorithm for time-varying system identification with applications to EEG[J]. IEEE Transactions on Instrumentation and Measurement, 2019. ISSN 0018-9456 (The first author is my supervisor at BUAA)
- Yang Li, **Jingbo Zhang**, Weigang Cui, Song Xu, and Qinglei Hu. A Fast Identification Method for Time-Varying Nonlinear Systems Based on Beta Wavelet Basis Function Expansion. CHN patent CN107967395A[P]
- Yang Li, Daxin Hao, **Jingbo Zhang**. An accurate time-varying Granger causality identification method based on multiwavelet basis function expansion. CHN patent CN108509933A.

RESEARCH EXPERIENCE

May.2020-Now **3D Reconstruction and textual optimization, 3D scene generation and editing, image inpainting**

- Reconstruct 3D models using multi-view RGB-D images, and jointly optimize their texture, geometry, and camera pose.
- Use few-shot dynamic frames to reconstruct an implicit 3D face model and perform novel view rendering and facial expression editing.
- Train a NeRF model of 3D mixed materials based on multi-view RGB, and perform BRDF material decomposition, editing and relighting on the model.
- Generate 3D scenes using prior of diffusion models.
- Generate 3D clothed human from a single image based on pretrained diffusion models.
- Video depth estimation.

Sep.2019-Apr.2020 **Object detection and image classification using RCNN series algorithms based on MS COCO, ImageNet and Pascal VOC datasets**

- Compare the modeling ideas of RCNN, Fast-RCNN, Faster-RCNN, and Mask-RCNN, and conducted preliminary tests of the above models based on the MS-COCO 2014 and PASCAL-VOC 2007 databases.
- Teste the object detection accuracy of Faster-RCNN and Mask-RCNN with ResNet C4 and FPN (Feature Pyramid Network) and performed the object detection simulation using trained Faster-RCNN and Mask-RCNN models.
- Complete some image classification tasks at Computer Vision Center of Tencent AI Lab.

Feb.2019-Jul.2019 **Spiking Neural Networks for function connectivity analysis of hippocampal neural spikes**

- Teste an ameliorated multiwavelet-based regularized forward orthogonal regression algorithm to improve the identification performance of a time-varying nonlinear generalized Laguerre-Volterra model, which is investigated for the nonstationary connectivity in spiking neural systems.
- Complete the simulation experiment and draft paper of the algorithm.

Nov.2017-Jan.2019 **Signal processing and system identification for modeling scalp EEG data**

- Propose a novel parametric modeling algorithm to identify time-varying nonlinear systems, where a new class of multiple beta wavelet basis function is introduced to approximate time-varying coefficients of the nonstationary system.
- Publishe an SCI paper and filed a patent.

SCHOLARSHIPS & HONORS

2023	Research Tuition Scholarship, CityU	
2022	Outstanding Academic Performance Award, CityU	
2020-2024	Ph.D. Scholarship, CityU	
2018	Outstanding Graduate Thesis Award	
2017	National Encouragement Scholarship	(Awarded to Top 5% students)
2017	Outstanding Academic Performance Scholarship	
2017	Model Student of Academic Records at BUAA	(Awarded to Top 3% students)
2017	Honorable Mention in the Zhou Peiyuan Mechanics Competition for College Students	
2017	Honorable Mention in Interdisciplinary Contest in Modeling	

2016, 2017 Scholarship for Excellent Social Work

2016, 2017 Excellent Student-Cadre at BUAA

EXTRA-CURRICULAR ACTIVITIES

Jul.2024-Now **Internship of Embodied Intelligence Technology Center of Robotics X**

Research in 4D reconstruction and video depth estimation.

May.2023-Jul.2024 **Internship of Visual Computing Center of Tencent AI Lab**

Research in 3D clothed human generation.

May.2020-Aug.2020 **Research Assistant CityU Shenzhen Research Institute**

Research in 3D object reconstruction and texture optimization.

Nov.2019-Apr.2020 **Internship of Computer Vision Center of Tencent AI Lab**

- Test image classification algorithm based on Deep Neural Network.
- Complete some image classification tasks.

Sep.2018 **Volunteer service for the 2018 Beijing Marathon**

- Prepare pre-match items for participating athletes.
- Provide guidance services for athletes.

Sep.2015-Jun.2018 **Monitor**

- Host most class meetings and organized the departmental evenings.
- Responsible for coordinating the work among the class committees.

Sep.2015-Jul.2017 **President of Fenghua Club at BUAA**

- Organize some public welfare book-sending activities and social practice activities.
- Host a series of appreciation activities for Chinese classical literature.

Jul.2014-Aug.2014 **Supporting the education in poverty-stricken areas**

- Teach mathematics without any compensation for primary school students in Yunnan mountainous area.