Visual Geometry Group (VGG)
Department of Engineering Science
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Chuanxia Zheng

Research Interests

My research interests focus on computer vision and machine learning, especially for scene understanding and synthesis. I have done a wide range of work on 2D and 3D scene synthesis, with the goal of *synthesizing a photorealistic virtual world.*

Education

Nanyang Technological University 2017.08–2021.06
Ph.D. in Computer Science, SCSE
Thesis: *Synthesizing Photorealistic Images with Deep Generative Learning*
Advisor: Tat-Jen Cham and Jianfei Cai

Beihang University 2014.09–2017.03
MA.E. in Automation Science
Thesis: *Context-based Indoor Scene Understanding for Mobile Robot*

Beijing Jiaotong University 2010.09–2014.07
B.E. in Electronic and Information Engineering

Employment

University of Oxford 2022.12–now
PostDoctoral Researcher in Computer Vision
Research interests: 2D and 3D scene synthesis, and unsupervised learning

Tap Mobile 2022.09–2022.11
AI research counselor in computer vision and machine learning group
Research interests: 2D image generation, completion and translation

Monash University 2021.08–2022.08
Research Fellow at Monash Research Institute of Science and Technology
Research interests: 2D image generation and 3D generation

Huawei Research 2017.01–2017.06
Research assistant at Noah's Ark Lab
Research interests: face recognition and generation

Tencent Research 2016.05–2016.09
Research Intern at Fundamental Research Center of Tencent
Work on news recommendation

Awards & Honors

NeurIPS 2022 Scholar/Travel Award	2022
NTU Outstanding PhD Thesis Award	2022
TMM Outstanding Reviewer Award	2021
NTU Research Scholarship	2017
Outstanding Graduate of Beijing	2014
National Second Prize of the National Electronic Design Contest of China (**Best one in Beijing**)	2013
Hanergy Scholarship Award (**Top 1%**)	2012
Siemens Scholarship Award (**Top 1%**)	2011

Press Coverage

Phys.org: Researchers unravel cell biology through artificial intelligence 2022

NTU News: NTU SCSE Outstanding PhD Thesis Award 2022 2022

Zhuanzhi: How to create photorealistic images? Ph.D. Thesis by Dr. Zheng 2022

kknews, Sohu, NetEase: AgileGAN — a new tool for creating stylized portraits 2021

Research Experience

VinAI, *The national AI research Lab of Vietnam*, Vietnam, Prof. Hung Bui 2021.11–2022.08
Cooperator on high quality image generation and data compression
one paper accepted by **NeurIPS(1)**, one paper accepted by **ICLR(1)**

Department of Data Science & AI, *Monash University*, Australia, Prof. Jianfei cai 2021.08–2022.08
Research interests: nature scene generation and completion
three papers accepted by **CVPR(1), ECCV(2)**, one paper submitted to **TPAMI**

Mechanobiology Institue (MBI), *NUS*, Singapore, Prof. Lim Chwee Teck 2020.01–2021.10
Cooperator on cell nuclear generation
one paper accepted by **Plos one(1)**

Institute for Media Innovation (IMI), *NTU*, Singapore, Prof. Nadia Thalmann 2017.08–2021.06
Research interests: photorealistic image generation
seven papers accepted by **CVPR(2), ECCV(1), ICCV(1), SIGGRAPH(1) and IJCV(2)**

IR&MCT Lab, *Beihang University*, China, Prof. Weihai Chen 2014.09–2017.03
Research interests: secne understanding and segmentation

Publications CVPR(3), ECCV(3), ICCV(1), NeurIPS(1), ICLR(1), IJCV(2), SIGGRAPH(1)

[18] Minghui Hu, **Chuanxia Zheng**, Heliang Zheng, Tat-Jen Cham, Zuopeng Yang, Chaoyue Wang, Dacheng Tao, and Ponnuthurai N. Suganthan. Unified discrete diffusion for simultaneous vision-language generation. In *The Eleventh International Conference on Learning Representations (**ICLR**)*, 2023.

[17] **Chuanxia Zheng**, Long Tung Vuong, Jianfei Cai, and Dinh Phung. Movq: Modulating quantized vectors for high-fidelity image generation. In *Thirty-sixth Conference on Neural Information Processing Systems (**NeurIPS**)*, 2022.

[16] Jyothsna Vasudevan*, **Chuanxia Zheng***, James G. Wan, Tat-Jen Cham, Lim Chwee Teck, and Javier G. Fernandez. From qualitative data to correlation using deep generative networks: Demonstrating the relation of nuclear position with the arrangement of actin filaments. ***PloS one***, 17(7):e0271056, 2022.

[15] Qianyi Wu, Xian Liu, Yuedong Chen, Kejie Li, **Chuanxia Zheng**, Jianfei Cai, and Jianming Zheng. Object-compositional neural implicit surfaces. In *Proceedings of the European Conference on Computer Vision (**ECCV**)*, 2022.

[14] Yuedong Chen, Qianyi Wu, **Chuanxia Zheng**, Tat-Jen Cham, and Jianfei Cai. Sem2nerf: Converting single-view semantic masks to neural radiance fields. In *Proceedings of the European Conference on Computer Vision (**ECCV**)*, 2022.

[13] **Chuanxia Zheng**, Tat-Jen Cham, Jianfei Cai, and Dinh Phung. Bridging global context interactions for high-fidelity image completion. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition(**CVPR**)*, pages 11512–11522, June 2022.

[12] **Chuanxia Zheng**, Duy-Son Dao, Guoxian Song, Tat-Jen Cham, and Jianfei Cai. Visiting the invisible: Layer-by-layer completed scene decomposition. *International Journal of Computer Vision (**IJCV**)*, 129(12):3195–3215, 2021.

[11] Yujun Cai, Yiwei Wang, Yiheng Zhu, Tat-Jen Cham, Jianfei Cai, Junsong Yuan, Jun Liu, **Chuanxia Zheng**, Sijie Yan, Henghui Ding, Xiaohui Shen, Ding Liu, and Nadia Magnenat Thalmann. A unified 3d human motion synthesis model via conditional variational auto-encoder. In *Proceedings of the International Conference on Computer Vision(**ICCV**)*, pages 11645–11655, 2021.

[10] **Chuanxia Zheng**, Tat-Jen Cham, and Jianfei Cai. Pluralistic free-form image completion. *International Journal of Computer Vision (**IJCV**)*, 129(10):2786–2805, 2021.

[9] Guoxian Song, Linjie Luo, Jing Liu, Wan-Chun Ma, Chunpong Lai, **Chuanxia Zheng**, and Tat-Jen Cham. Agilegan: stylizing portraits by inversion-consistent transfer learning. *ACM Transactions on Graphics (**TOG**)*, 40(4):1–13, 2021.

[8] **Chuanxia Zheng**, Tat-Jen Cham, and Jianfei Cai. The spatially-correlative loss for various image translation tasks. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition(**CVPR**)*, pages 16407–16417, 2021.

[7] **Chuanxia Zheng**, Tat-Jen Cham, and Jianfei Cai. Pluralistic image completion. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, pages 1438–1447, 2019.

[6] Tianyi Zhang, Jingyi Yang, **Chuanxia Zheng**, Guosheng Lin, Jianfei Cai, and Alex C Kot. Task-in-all domain adaptation for semantic segmentation. In *2019 IEEE Visual Communications and Image Processing (**VCIP**)*, pages 1–4. IEEE, 2019.

[5] **Chuanxia Zheng**, Tat-Jen Cham, and Jianfei Cai. T2net: Synthetic-to-realistic translation for solving single-image depth estimation tasks. In *Proceedings of the European Conference on Computer Vision (**ECCV**)*, pages 767–783, 2018.

[4] **Chuanxia Zheng**, Jianhua Wang, Weihai Chen, and Xingming Wu. Multi-class indoor semantic segmentation with deep structured model. *The Visual Computer (**TVCJ**)*, 34(5):735–747, 2018.

[3] Jianhua Wang, **Chuanxia Zheng**, Weihai Chen, and Xingming Wu. Learning aggregated features and optimizing model for semantic labeling. *The Visual Computer (**TVCJ**)*, 33(12):1587–1600, 2017.

[2] **Chuanxia Zheng**, Jianhua Wang, Weihai Chen, and Xingming Wu. Semantic segmentation based on aggregated features and contextual information. In *2016 IEEE International Conference on Robotics and Biomimetics (**ROBIO**)*, pages 862–867. IEEE, 2016.

[1] Jianhua Wang, **Chuanxia Zheng**, Weihai Chen, and Xingming Wu. Learning contextual information for indoor semantic segmentation. In *2016 IEEE 11th Conference on Industrial Electronics and Applications (**ICIEA**)*, pages 1639–1644. IEEE, 2016.

Preprints

[4] Yuedong Chen, Haofei Xu, Qianyi Wu, **Chuanxia Zheng**, Tat-Jen Cham, and Jianfei Cai. Explicit correspondence matching for generalizable neural radiance fields. *Under reviewer.*

[3] Long Tung Vuong, Trung Le, He Zhao, **Chuanxia Zheng**, Mehrtash Harandi, Jianfei Cai, and Dinh Phung. Vector quantized wasserstein auto-encoder. *Under reviewer.*

[2] Yuzhu Ji, **Chuanxia Zheng**, and Tat-Jen Cham. One-shot human motion transfer via occlusion-robust flow prediction and neural texturing. *Under reviewer.*

[1] **Chuanxia Zheng**, Guoxian Song, Tat-Jen Cham, Jianfei Cai, Linjie Luo, and Dinh Phung. High-quality pluralistic image completion via code sharing. *Under reviewer.*

Academic Services

Journal Reviewer

IEEE Transactions on Pattern Analysis and Machine Intelligence	TPAMI
International Journal of Computer Vision	IJCV
IEEE Transactions on Image Processing	TIP
IEEE Journal of Automatica Sinica	JAS
IEEE Transactions on Multimedia (**Outstanding Reviewer Award, 2021**)	TMM
IEEE Transactions on Circuits and Systems for Video Technology	TCSVT
Computer Vision and Image Understanding	CVIU
The Visual Computer	TVCJ
Neural Computing and Applications	NCAA

Conference Reviewer

Computer Vision and Pattern Recognition Conference (CVPR)	2020, 2021, 2022, 2023
European Conference on Computer Vision (ECCV)	2020, 2022
International Conference on Computer Vision (ICCV)	2019, 2021
International Conference on Learning Representations (ICLR)	2021, 2022, 2023
The Fortieth International Conference on Machine Learning (ICML)	2023
Conference on Neural Information Processing Systems (NeurIPS)	2022
International Conference on Computer Graphics (SIGGRAPH)	2021, 2022
International Joint Conference on Artificial Intelligence (IJCAI)	2022
ACM Multimedia (ACMMM)	2021, 2022
International Conference on Robotics and Automation (ICRA)	2023
International Conference on Intelligent Robots and Systems (IROS)	2022

Talks

Synthesizing Photorealsitic Scenes, SCSE Gratuate Chat Series Discussion, NTU	2022.09
Synthesizing Photorealsitic Scenes, Visual Geometry Group, Oxford	2022.08
Synthesizing Photorealsitic Scenes, Computer Vision & Geometry Group, ETH	2022.06
Synthesizing Photorealsitic Scenes, Graphics & Geometric Computing Laboratory, USTC	2022.01
Pluralistic Image Completion, *Institute of Media Innovation*, NTU	2019.11
Depth Estimation from Single 2D Image, *Institute of Media Innovation*, NTU	2018.06

Teaching

Teaching Assistant, *Advanced Digital Image Processing*, Graduate, NTU	2018–2020
Teaching Assistant, *Human-Computer Interaction*, Undergraduate, NTU	2018–2020
Teaching Assistant, *Engineering Mathematics*, Undergraduate, NTU	2018–2019