Wei Mao, XR Vision Labs, Canberra

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Research Expertise

- **Human Motion Generation**, generating human motion from past motion, music, action, text, using Transformers, RNNs, Fourier Transforms and GCNs.
- **3D Vision**, including 3D AIGC, 3D reconstruction, neural rendering (NeRF), MVS
- **Generative models**, including VAEs, GANs, NFs, Diffusion models, Autoregressive models.

Education

2018 – 2023 **Ph.D., Australian National University, Canberra, Australia.**
Research topic: *Human Motion Understanding*
Supervisor: Dr. Miaomiao Liu.
Working closely with Dr. Mathieu Salzmann from EPFL
Thesis: Human Motion Prediction: From Deterministic to Stochastic

2016 – 2018 **Master of Computing (advanced), Australian National University, Canberra, Australia.**
Specialisations: Artificial Intelligence

2009 – 2013 **Bachelor of Engineering, East China University of Science and Technology, Shanghai, China.**
Major: Information Engineering

Employment History

2024 – now **Senior Research Scientist, XR Vision Labs, Tencent, Canberra, Australia.**
Responsibilities:
- Designing and training diffusion models to generate 3D objects/characters.
- Developing algorithms to rig and animate the generated characters.

2022 – 2024 **Postdoc, Australian National University, Canberra, Australia.**
Supervisor: Prof. Richard Hartley, Dr. Miaomiao Liu.
Responsibilities:
- supervising PhD students
- doing research on human-scene interaction, Neural Rendering and 3D reconstruction.

2013 – 2016 **Software Engineer, Dongyuan Computer Automation Engineering Co.,Ltd., Shanghai, China**
Responsibilities: Web Development

Publications

Journal Articles

1. **Mao, W.**, Liu, M., Salzmann, M., & Li, H. (2021). Multi-level motion attention for human motion prediction. *International Journal of Computer Vision (IJCV)*.
2. Yang, J., **Mao, W.**, Alvarez, J. M., & Liu, M. (2021). Cost volume pyramid based depth inference for multi-view stereo. *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*.

Conference Proceedings

1. **Mao, W.**, Hartley, R., Mathieu, S., & Liu, M. (2024). *Neural sdf flow for 3d reconstruction of dynamic scenes*. The International Conference on Learning Representations (ICLR).
2. Wang, R., **Mao, W.**, Lu, C., & Li, H. (2024). *Towards high-quality 3d motion transfer with realistic apparel animation*. European Conference on Computer Vision (ECCV).
3. Xing, C., **Mao, W.**, & Liu, M. (2024). *Scene-aware human motion forecasting via mutual distance prediction*. European Conference on Computer Vision (ECCV).
4. Gao, H., **Mao, W.**, & Liu, M. (2023). *Visfusion: visibility-aware online 3d scene reconstruction from videos*. Conference on Computer Vision and Pattern Recognition (CVPR).
5. Wang, J., **Mao, W.**, & Liu, M. (2023). *Midget: music conditioned 3d dance generation*. Australian Joint Conference on Artificial Intelligence (AJCAI).
6. Wang, R., **Mao, W.**, & Li, H. (2023a). *Deepsimho: stable pose estimation for hand-object interaction via physics simulation*. Neural Information Processing Systems (NeurIPS).
7. Wang, R., **Mao, W.**, & Li, H. (2023b). *Interacting hand-object pose estimation via dense mutual attention*. Winter Conference on Applications of Computer Vision (WACV).
8. **Mao, W.**, Liu, M., Hartley, R., & Salzmann, M. (2022). *Contact-aware human motion forecasting*. Advances in Neural Information Processing Systems (NeurIPS) Spotlight.
9. **Mao, W.**, Liu, M., & Salzmann, M. (2022). *Weakly-supervised action transition learning for stochastic human motion prediction*. Conference on Computer Vision and Pattern Recognition (CVPR) ORAL.
10. **Mao, W.**, Liu, M., & Salzmann, M. (2021). *Generating smooth pose sequences for diverse human motion prediction*. International Conference on Computer Vision (ICCV) ORAL.
11. **Mao, W.**, Liu, M., & Salzmann, M. (2020). *History repeats itself: human motion prediction via motion attention*. European Conference on Computer Vision (ECCV).
12. Yang, J., **Mao, W.**, Alvarez, J. M., & Liu, M. (2020). *Cost volume pyramid based depth inference for multi-view stereo*. Conference on Computer Vision and Pattern Recognition (CVPR) ORAL.
13. **Mao, W.**, Liu, M., Salzmann, M., & Li, H. (2019). *Learning trajectory dependencies for human motion prediction*. International Conference on Computer Vision (ICCV) ORAL.

Teaching

Guest Lecturer
- Advanced Computer Vision (ENGN8501), ANU. (2022, 2023)

Tutor
- Artificial Intelligence (COMP3620), ANU. (2018, 2021);
  Computer Vision (ENGN6528), ANU. (2019, 2021);
  Relational Database (COMP6240), ANU. (2017, 2018)

Academic Service

Reviewer
- **CVPR**: 2021,2022,2023,2024,2025; **ICCV**: 2021,2023; **IJCAI**: 2022,2023; **ICML**: 2022,2023; **NeurIPS**: 2021,2022; **RAL**: 2021,2022,2023; **ICLR**: 2024.

Honour

- **NeurIPS22 Top Reviewer, CVPR22 Outstanding Reviewer, ICCV19 Travel Award**