

# Lizhen Wang 王立祯



Postdoc at Tsinghua University

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Research Interest: 3D face/body reconstruction, face tracking, styleGAN/NeRF-based portrait avatar.

## EDUCATION

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### **Tsinghua University, Ph.D.**

*Aug. 2018-Jun. 2023*

Major in Control Science and Engineering, the Department of Automation

- GPA: 3.7/4.0
- Supervisor: Prof. Yebin Liu
- Teaching assistant of Data Structure course, Second-class scholarship of Tsinghua University

### **Tsinghua University, Bachelor of Science**

*Aug. 2014-Jul. 2018*

Major in Science of Mathematics and Physics, the Department of Physics

- GPA: 89/100
- Academic Excellence Scholarship of Tsinghua University, Social Work Excellence Scholarship of Tsinghua University
- First Prize of Hebei Province in Chinese Physics Olympiad in senior high school

## EXPERIENCES

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### **Tsinghua University | Department of Automation**

*July. 2023-Present*

*Postdoc*

- Supervisor: Prof. Yebin Liu

### **Ant Group | Alipay Business Line, IoT Division**

*May. 2020- Jul. 2021 & Jul. 2022- Sep. 2022*

*Research Internship*

Mentor: Dr. Chenguang Ma

- Real-time 3D face tracking using a single RGB camera or RGB-D camera
- FaceVerse in publications: building the high-fidelity Chinese 3D face morphable Model (3DMM) using a hybrid dataset.

### **The University of Texas at Austin | Graphics & AI Lab**

*Jul. 2017- Sep. 2017*

*Summer Internship*

Advisor: Prof. Qixing Huang

- Manifold CNN structure for 3D objects.

## PUBLICATIONS

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- [1] **Lizhen Wang**, Xiaochen Zhao, Yuxiang Zhang, Hongwen Zhang, Tao Yu and Yebin Liu  
*StyleAvatar: Real-time Photo-realistic Portrait Avatar from a Single Video*  
ACM SIGGRAPH 2023 Conference Proceedings
- [2] **Lizhen Wang**, Zhiyuan Chen, Tao Yu, Chenguang Ma, Liang Li and Yebin Liu  
*FaceVerse: a Fine-grained and Detail-controllable 3D Face Morphable Model from a Hybrid Dataset*  
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022
- [3] **Lizhen Wang**, Xiaochen Zhao, Tao Yu and Yebin Liu  
*NormalGAN: Learning Detailed 3D Human from a Single RGB-D Image*  
European Conference on Computer Vision (ECCV), 2020
- [4] Jingxiang Sun, Xuan Wang, **Lizhen Wang**, Xiaoyu Li, Yong Zhang, Hongwen Zhang, Yebin Liu.  
*Next3D: Generative Neural Texture Rasterization for 3D-Aware Head Avatars*  
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023
- [5] Jingxiang Sun, Xuan Wang, Yichun Shi, **Lizhen Wang**, Jue Wang and Yebin Liu  
*IDE-3D: Interactive Disentangled Editing for High-Resolution 3D-aware Portrait Synthesis*  
SIGGRAPH Asia (Journal Track), 2022
- [6] Shi Yan, Chenglei Wu, **Lizhen Wang**, Feng Xu, Liang An, Kaiwen Guo, and Yebin Liu  
*DDRNet: Depth Map Denoising and Refinement for Consumer Depth Cameras Using Cascaded CNNs*  
European Conference on Computer Vision (ECCV), 2018
- [7] Yuelang Xu, **Lizhen Wang**, Xiaochen Zhao, Hongwen Zhang and Yebin Liu.  
*AvatarMAV: Fast 3D Head Avatar Reconstruction Using Motion-Aware Neural Voxels*  
ACM SIGGRAPH 2023 Conference Proceedings
- [8] Yuelang Xu, Hongwen Zhang, **Lizhen Wang**, Xiaochen Zhao, Han Huang, Guojun Qi and Yebin Liu. *LatentAvatar: Learning Latent Expression Code for Expressive Neural Head Avatar*  
ACM SIGGRAPH 2023 Conference Proceedings

## PROJECTS EXPERIENCES

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### 3D face morphable model—FaceVerse and 3D face reconstruction

- FaceVerse is a 3D face morphable model from a large face RGB-D dataset and high-fidelity 3D head models.
- We also present a single-image face 3D reconstruction algorithm based on FaceVerse. **Github:** <https://github.com/LizhenWangT/FaceVerse>

### Real-time face tracking using a single RGB/RGB-D camera

- Face tracing using differentiable rendering. The code is optimized to real-time using Jittor & CUDA.
- The expression-related blendshapes are fitted to the 52 ARKit blendshapes. So we can also drive some animatable head model using this algorithm.

**Demo:** <https://github.com/LizhenWangT/FaceVerse> **Fig.4**

### **2D/3D realistic head avatar (face reenactment)**

- Real-time 2D head avatar from a single RGB video using a StyleGAN-based network.
- 3D neural head avatar from a single view or multi-view RGB video using NeRF.

**Github:** <https://github.com/LizhenWangT/StyleAvatar>

### **3D human body reconstruction from a single RGB-D image**

• Data-driven 3D body reconstruction from a single RGB-D image, we optimize the body geometry using the normal map with a GAN network.

**Github:** <https://github.com/LizhenWangT/NormalGAN>

### **Audio-driven Digital Face Generation**

• Utilizing voice predictions from the FaceVerse model to generate expression parameters, which are then rendered into 3DMM images and applied to the real-time high-fidelity digital face generation project StyleAvatar.

## **LEADERSHIP AND ACTIVITIES**

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**Student Union**, Department of Physics | Vice President

*Jul. 2016 – Jun. 2017*

· Responsible for the life rights and interests of students in our department

· Responsible for the financial management and materials management of the student union

## **SKILLS**

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**Languages:** Chinese, English, Japanese

**Programming Languages:** C&C++ (OpenGL/CUDA/TensorRT), Python, Java, Matlab

**Deep Learning Platforms:** PyTorch, TensorFlow

Solid mathematics and physics knowledge

Solid computer programming skills

Github: <https://github.com/LizhenWangT>

CVPR, ICCV, ECCV, SIGGRAPH Asia reviewer