Xinshuang Liu

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Education

Tsinghua University, Beijing, China *Aug. 2017 – Jun. 2022*

- B.Eng. in Software Engineering, School of Software, Overall GPA: 3.62/4, Rank: 28/81
- Graded **4.0**/4.0 in twelve AI and mathematics courses, including *Deep Reinforcement Learning (Graduate Level)*, *Foundation of Artificial Intelligence*, *Statistical Inference*, *Applied Stochastic Processes*, etc.

Publications

- **Xinshuang Liu**, Siqi Li, and Yue Gao, "MattRecon: A Joint Framework for Image Matting and 3D Object Reconstruction", submitted to **T-PAMI**
- **Xinshuang Liu**, Lin Bie, Yingxi Li, Shunfei Wang, Qiao Lv, Xiangdong Dai, and Yue Gao, "Real-World RGB-D Image Matting", submitted to **T-PAMI**
- Chuan Guo, Xinxin Zuo, Sen Wang, **Xinshuang Liu**, Shihao Zou, Minglun Gong, Li Cheng, "Action2video: Generating Videos of Human 3D Actions", in **IJCV**

Research Experience

Large-scale and Real-time 3D Scene Reconstruction *Dec. 2022 – Present*

Research Intern, Mentor: Researcher Yizhong Zhang *Microsoft Reasearch Asia*

- Plan to accelerate 3D scene reconstruction methods by designing novel surface representations

3D Object Reconstruction for Unforeseen Categories *Mar. 2022 – Oct. 2022*

Research Assistant, Advisor: Prof. Yue Gao *Tsinghua University*

- Aimed at automatic 3D object reconstruction based on multi-view RGB images for unforeseen categories
- Proposed a joint framework for image matting and 3D object reconstruction, which iteratively integrates multi-view 2D semantics and 3D geometry to improve the image matting results of each view and, in turn, improve the 3D reconstruction result
- Printed the reconstruction results of daily life objects using a 3D printer

Real-World RGB-D Image Matting *Apr. 2021 – Feb. 2022*

Research Assistant, Advisor: Prof. Yue Gao *Tsinghua University*

- Achieved automatic image matting for objects from unforeseen categories while preserving fine structures
- Proposed an RGB-D image matting method, which uses depth images to robustify the semantic estimation for unforeseen categories, and uses RGB-D domain adaptation modules to bridge the gap between composite data and real-world data
- Developed an automatic image matting application system, including a mobile app and a website

3D Human Motion Generation *Jun. 2020 – Sep. 2020*

Research Assistant, Advisor: Prof. Li Cheng *University of Alberta*

- Worked on generating 3D human motion videos from prescribed action categories and a single human image
- Improved the existing 3D reconstruction methods for clothed humans
- Implemented an automatic Unity pipeline to render videos of 3D human motions in different scenes

Selected Awards

- Science and Technology Innovation Scholarship (Only one among 93 students) *2020*
- National 2^{nd} Prize, Contemporary Undergraduate Mathematical Contest in Modeling (Top 5 in Tsinghua) *2019*
- 1^{st} Prize in Beijing, Contemporary Undergraduate Mathematical Contest in Modeling *2019*
- $3^{rd}/194$, Kaggle Competition of Noisy Image Classification (All contestants are Tsinghua students) *2019*
- 1^{st} Prize, National Physics Competition for College Students, Class A of Non-physics (For top universities) *2018*
- Silver Prize, Chinese Physics Olympiad (Top 3 in Tianjin) *2016*

Skills

Language & Tools: Python, C/C++, MATLAB, R, Java, TaiChi, PyTorch, TensorFlow, Scikit-learn, LaTeX, Git, Qt, Unity
Algorithms: Computer Vision, Machine Learning, Reinforcement Learning, Dynamic Programming, Search