Hongrui Cai

Email: hrcai AT mail.ustc.edu.cn   **GitHub**: github.com/RainbowRui   **Homepage**: rainbowrui.github.io

Research Interests	Computer Vision & Graphics: 3D reconstruction, structure-from-motion, geometry learning, image and video generation.

Education

University of Science and Technology of China　　　　Hefei, China
Ph.D. in Data Science　　　　Sep. 2019 – Present
Mentor: Prof. Juyong Zhang. GPA: **3.85**/4.3

South China University of Technology　　　　Guangzhou, China
B.S. in Mathematics and Applied Mathematics　　　　Sep. 2015 – Jun. 2019
Ranking: **1**/46. GPA: **92.15**/100

Experience

Ant Group　　　　Hangzhou, China
Research Intern @ Interaction Intelligence Lab　　　　May. 2023 – Present
Mentor: Dr. Xuan Wang

Papers

Xin Huang, Dong Liang, **Hongrui Cai**, Yunfeng Bai, Juyong Zhang, Jinyuan Jia. Double References Guided Interactive 2D and 3D Caricature Generation. Under review.

Wanquan Feng, **Hongrui Cai**, Junhui Hou, Bailin Deng, Juyong Zhang. Differentiable Deformation Graph based Neural Non-rigid Registration. *Communications in Mathematics and Statistics (CIMS)*, 2023.

Hongrui Cai, Wanquan Feng, Xuetao Feng, Yan Wang, Juyong Zhang. Neural Surface Reconstruction of Dynamic Scenes with Monocular RGB-D Camera. *NeurIPS*, 2022 **(Spotlight)**.

Xin Huang, Dong Liang, **Hongrui Cai**, Juyong Zhang, Jinyuan Jia. CariPainter: Sketch Guided Interactive Caricature Generation. *ACM MM*, 2022.

Wanquan Feng, Jin Li, **Hongrui Cai**, Xiaonan Luo, Juyong Zhang. Neural Points: Point Cloud Representation with Neural Fields for Arbitrary Upsampling. *CVPR*, 2022.

Hongrui Cai, Yudong Guo, Zhuang Peng, Juyong Zhang. Landmark Detection and 3D Face Reconstruction for Caricature using a Nonlinear Parametric Model. *Graphical Models (GMOD)*, 2021.

Wanquan Feng, Juyong Zhang, **Hongrui Cai**, Haofei Xu, Junhui Hou, Hujun Bao. Recurrent Multi-view Alignment Network for Unsupervised Surface Registration. *CVPR*, 2021.

Yudong Guo, Juyong Zhang, Yihua Chen, **Hongrui Cai**, Zhangjin Huang, Bailin Deng. Real-time Face View Correction for Front-facing Cameras. *Computational Visual Media (CVM)*, 2021.

Projects	**Self-supervised Topology-aware Non-rigid Point Cloud Registration**

Research project   Jun. 2022 – Apr. 2023

Proposing a non-rigid registration method, including a topology-aware feature extraction module and a self-supervised training strategy, significantly improves the performance of registration in dynamic topology regions.

Monocular RGB-D based Wound Surface Modeling

Horizontal research project   May. 2022 – Jun. 2022

Based on monocular RGB-D video sequences, proposing a highly automatic algorithm to reconstruct high-fidelity wound surface and then measure the area and depth of the wound.

Audio driven Talking Head Synthesis

Horizontal research project   Aug. 2020 – Nov. 2020

Developing a deep learning based head reconstruction baseline (via RGB, RGB-D or video input) which utilizes a differentiable rendering technology.

Real-time Face View Correction for Front-facing Cameras

Horizontal research project   Sep. 2019 – Oct. 2020

Proposing a fully automatic face view correction system based on a single RGB(-D) camera to solve video problems of "upward nose" and "big face" caused by the disparity between camera location and face orientation.

Reviewers	Conferences: CVPR 2023, ICCV 2023
	Journals: IEEE Transactions on Multimedia, Computers & Graphics

Academic Talks	Spotlight presentation in NeurIPS 2022	Dec. 2022
	Invited talk in Jiqizhixin	Nov. 2022
	Oral presentation in CVM 2021	Apr. 2021

Selected Honors	First-class Academic Scholarships for Postgraduates, by USTC	2019 - 2022
	Excellent Undergraduate Thesis Award, by SCUT	2019
	Excellent Undergraduate Student, by SCUT	2019