

# Hongrui Cai

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**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 3D Vision      Sep. 2021 – Present  
Mentor: Prof. Juyong Zhang.

**University of Science and Technology of China**      Hefei, China  
M.S. in Data Science      Sep. 2019 – Jul. 2021  
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**, Haoifei 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

