# Mingrui Zhang

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## Education

- **Tsinghua University** Sep. 2020 – Jun. 2023
  - Master Degree in Software Engineering. GPA: 3.61/4.0.
- **Beijing University of Posts and Telecommunications** Sep. 2016 – Jun. 2020
  - B.S (Hons.) in Computer Science and Technology. Rank: 6/321 (TOP 1.87%)
- **University of Cambridge** Jul. 2018 – Aug. 2018
  - Cambridge Summer Programme in Sidney Sussex College. Grade: 89.8/100 (Credits: 38)

## Experience

- **International Research & Development Center, Sensetime** *Algorithm Researcher* 2023.7 – Present
  **Research Topics**: 3D reconstruction, multi-camera system
  - Responsible for the pipeline for the Archery Project, focusing on real-time trajectory reconstruction and high-precision arrow targeting. Design a multi-camera and lidar system for trajectory analysis and develope keypoint models for precise shot location prediction, achieving state-of-the-art results. The system is utilized by the World Archery and Paris Olympics 2024.
  - Responsible for a 3D reconstruction pipeline to predict the rotation speed and direction of ping pong balls. Develop a quaternion regression model for accurate real-time spinning estimations. Achieve a sota prediction accuracy of 98% and the system is used by World Table Tennis.
- **Y-Tech, Kwai Technology Co., Ltd.** *Research Intern* 2021.10 – 2023.6(1yr.9mo.)
  **Research Topics**: 3D human scene interaction and human motion generation (motion parameterization)
  - Develop a motion adaptation algorithm for the Human Scene Interaction (HSI) problem using MotionBuilder, allowing characters to automatically adapt to their environment without the need for additional training data.
  - Optimize the interactions between virtual characters and the environment in live video feed, improve the naturalness and expressiveness of character motion in real 3D scenes.
  - Create motion parameterization algorithm for semantics-preserving motion blending from multiple regular animation clips, design a global optimization algorithm to improve the naturalness of spatial composition results.
- **Video Technology Team, Kwai Technology Co., Ltd.** *Research Intern* 2020.2 – 2021.8(1yr. 7mo.)
  **Research Topics**: automatic photo collage and image quality assessment
  - Design deep aesthetic network for collage feature extraction and propose a sequential decision model based on Deep Reinforcement Learning (DRL) to achieve high quality collage generation.
  - Construct a million-scale image quality dataset with web data collection, improve the mean of opinion (MOS) score prediction accuracy of image quality assessment (IQA) task by up to 5% with self-supervised learning (SSL) model pretrained on the proposed IQA dataset.

## Publications

- **Automatic Human Scene Interaction through Contact Estimation and Motion Adaptation** *ACMMM* 2023
  - Authors: **Mingrui Zhang**, Ming Chen, Yan Zhou, Li Chen et al. [web][pdf]
- **Aesthetic Photo Collage with Deep Reinforcement Learning.** *IEEE Trans. Multimedia* 2022
  - Authors: **Mingrui Zhang**, Mading Li, Li Chen*, Jiahao Yu. [web][pdf]
- **SoftCollage: A Differentiable Probabilistic Tree Generator for Image Collage.** *CVPR* 2022
  - Authors: Jiahao Yu, Li Chen*, **Mingrui Zhang**, Mading Li. [web][pdf]

## Skills

- **Programming**: Python, C/C++, MATLAB, HTML, LaTeX.
- **Frameworks**: PyTorch, NumPy, OpenCV, TensorFlow.
- **Courses(Grade)**: Data structure(A), Advanced Mathematics(A), Principles of Artificial Intelligence(A), Operating system(A), Digital Image Processing(A), Deep Learning(A-), Object-Oriented Programming(A)
- **Languages**: English(CET4: 614, CET6: 588, NECCS First Prize), Mandarin(Native speaker)