

ZENGHAO CHAI

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🎓 EDUCATION

National University of Singapore

Singapore

- Ph.D. Student in Computer Science. Apr. 2023 – Jul. 2027 (expected)
- Research Topics: Digital Humans, Text-guided Generation, Generative Visual Retrieval.

Tsinghua University

Beijing, China

- Master of Computer Technology. Supervisor: [Prof. Chun Yuan](#). Sept. 2020 – Jun. 2023
- Master Thesis: High-Fidelity 3D Face Reconstruction and Its Evaluation. GPA: 3.74/4.00

Beijing Institute of Technology

Beijing, China

- Bachelor of Software Engineering. GPA: 90.97/100, Rank: 2/185 (Top 1%) Sept. 2016 – Jul. 2020

💻 WORK EXPERIENCE

Microsoft Research Asia, Beijing, China

May. 2022 – Mar. 2023

Research Intern in Machine Learning Group. Topics: 3D Face Reconstruction & Animation.

- Extend the dense landmark optimization framework into learning-based models for detailed 3D face reconstruction.
- Exploit perceptual signals of face attributes to learn high-level representations for expressive coefficient regression.
- Design SD-DeTail Module to decouple static and dynamic factors for synthesizing realistic and animatable details.
- Propose HiFace and loss functions to jointly learn the coarse shape and details from synthetic and real-world data.

Tencent AI Lab, Shenzhen, China

Mar. 2021 – May. 2022

Research Intern in Digital Human Team. Topics: 3D Face Reconstruction, 3D Face Modeling & Evaluation.

- Unify topology for 2,000+ 3D scans and construct an expressive 3DMM named HIFI3D++ with 500+ dimensions.
- Construct a region-aware benchmark named REALY and propose a region-aware pipeline for quantitative evaluation.
- Reproduce and evaluate 10+ state-of-the-art reconstruction models on the benchmark and update the leaderboard.
- Release HIFI3D++, REALY, and evaluation codes for research purposes and contribute to the 3D face community.

📄 PUBLICATION & PREPRINT (“*” indicates equal contribution)

◦ HiFace: High-Fidelity 3D Face Reconstruction by Learning Static and Dynamic Details

Zenghao Chai, Tianke Zhang, Tianyu He, Xu Tan, Tadas Baltrušaitis, HsiangTao Wu, Runnan Li, Sheng Zhao, Chun Yuan, Jiang Bian.

IEEE/CVF International Conference on Computer Vision (ICCV), 2023.

🌐 Project Page: project-hiface.github.io

◦ Towards Effective Collaborative Learning in Long-Tailed Recognition

Zhengzhuo Xu*, Zenghao Chai*, Chengyin Xu, Chun Yuan, Haiqin Yang.

IEEE Transactions on Multimedia (TMM), 2023.

◦ SEAM: Searching Transferable Mixed-Precision Quantization Policy through Large Margin Regularization

Chen Tang, Kai Ouyang, Zenghao Chai, Yunpeng Bai, Yuan Meng, Zhi Wang, Wenwu Zhu.

ACM International Conference on Multimedia (ACM MM), 2023.

◦ Learning Imbalanced Data with Vision Transformers

Zhengzhuo Xu, Ruikang Liu, Shuo Yang, Zenghao Chai, Chun Yuan.

IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023.

◦ HHF: Hashing-guided Hinge Function for Deep Hashing Retrieval

Chengyin Xu*, Zenghao Chai*, Zhengzhuo Xu*, Hongjia Li, Qiruyi Zuo, Lingyu Yang, Chun Yuan.

IEEE Transactions on Multimedia (TMM), 2022.

◦ Semantic-Sparse Colorization Network for Deep Exemplar-based Colorization

Yunpeng Bai, Chao Dong, Zenghao Chai, Andong Wang, Zhengzhuo Xu, Chun Yuan.

European Conference on Computer Vision (ECCV), 2022.

◦ REALY: Rethinking the Evaluation of 3D Face Reconstruction

Zenghao Chai*, Haoxian Zhang*, Jing Ren, Di Kang, Zhengzhuo Xu, Xuefei Zhe, Chun Yuan, Linchao Bao.

European Conference on Computer Vision (ECCV), 2022.

🌐 Project Page: real3dface.com

◦ HyP² Loss: Beyond Hypersphere Metric Space for Multi-label Image Retrieval

Chengyin Xu*, Zenghao Chai*, Zhengzhuo Xu, Chun Yuan, Yanbo Fan, Jue Wang.

ACM International Conference on Multimedia (ACM MM), 2022.

- **CMS-LSTM: Context Embedding and Multi-Scale Spatiotemporal Expression LSTM for Predictive Learning**
Zenghao Chai, Zhengzhuo Xu, Yunpeng Bai, Zhihui Lin, Chun Yuan.
IEEE International Conference on Multimedia and Expo (ICME), 2022.
- **MoDeRNN: Towards Fine-grained Motion Details for Spatiotemporal Predictive Learning**
Zenghao Chai, Zhengzhuo Xu, Chun Yuan.
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2022.
- **Towards Calibrated Model for Long-Tailed Visual Recognition from Prior Perspective**
Zhengzhuo Xu*, Zenghao Chai*, Chun Yuan.
Neural Information Processing Systems (NeurIPS), 2021.

INVENTION PATENT

- **A 3D Model Error Estimation Method and Apparatus, Device, and Storage Medium**
Haoxian Zhang, Zenghao Chai, Linchao Bao, Di Kang.
Invention patent, Submitted, 2022.
- **A Retrieval Method and Apparatus, Device, and Storage Medium**
Chengyin Xu, Zenghao Chai, Zhengzhuo Xu, Yanbo Fan.
Invention patent, Published Application Number: CN115146143A, 2022.
- **A Lightweight Fine-grained Spatiotemporal Predictive Method and System**
Chun Yuan, Zenghao Chai, Zhengzhuo Xu.
Invention patent, Published Application Number: CN114445463A, 2022.
- **A Move Generation Method for Game of the Amazons Based on Deep Convolutional Neural Network**
Chongyang Shi, Zhaohe Liao, Zenghao Chai.
Invention patent, Authorization Announcement Number: CN111330255B, 2020.

COMPETITION

- **Gold Medal** of ICGA Computer Olympiad, *International Computer Games Association* 2019
- **Meritorious Winner** of MCM/ICM Contest in Modeling, *Consortium for Mathematics and Its Applications* 2019
- **Gold Medal** of International Genetically Engineered Machine Competition, *Massachusetts Institute of Technology* 2018
- **Second Prize** of Computer Games Championship, *Chinese Association for Artificial Intelligence* 2018
- **Second Prize** of National Computer Games Tournament, *Chinese Association for Artificial Intelligence* 2018
- **Third Prize** of Beijing Physics Competition, *Beijing Physical Society* 2017
- **First Prize** of China Mathematics Competition, *Chinese Mathematical Society* 2017
- **First Prize** of Beijing Mathematics Competition, *Beijing Mathematical Society* 2017

AWARD & HONOR

- President's Graduate Fellowship of *National University of Singapore* 2023
- First Prize in Internship Award of *Tsinghua University (Top 1%)* 2023
- Award of Excellence in "Stars of Tomorrow" Internship Program of *Microsoft Research Asia (Top 5%)* 2023
- National Scholarship of *Ministry of Education (Top 0.2%, 3 times)* 2018/2019/2022
- Ping An AI BANK Fellowship (**Top 5%**) 2021
- Outstanding Graduate of *Beijing and Beijing Institute of Technology (Top 5%)* 2020
- Teli Xu Fellowship (**Top 0.1%**) 2020
- Beijing Merit Student (**Top 1%**) 2020
- Competition Scholarship of *Beijing Institute of Technology (Top 5%, 2 times)* 2019/2020
- Innovation Scholarship of *Ministry of Industry and Information Technology (Top 1%)* 2019
- JJWorld Fellowship (**Top 5%**) 2017
- First Prize Scholarship of *Beijing Institute of Technology (Top 5%, 6 times)* 2017/2018/2019/2020

SKILL & ACTIVITY

- **Programming:** Python, PyTorch, PyTorch3D, TensorFlow, L^AT_EX, WRAP, C/C++, SQL.
- **Language:** Mandarin (Native), English (Fluent, IELTS: 7.0).
- **Talk:** "REALY: Rethinking the Evaluation of 3D Face Reconstruction", MPI-IS, Online, Aug. 2022.
- **Reviewer Service:** TNNLS, PG 2023, NeurIPS 2023, ICCV 2023, CVPR 2023, ECCV 2022.