

He CAO

PHD CANDIDATE · IIP(AI) PROGRAM

Clear Water Bay, Kowloon, Hong Kong

☎ +86 188-5522-1256 | ✉ hcaoaf@connect.ust.hk | 📷 CiaoHe | 🐦 @Shinichi_Izummm

Education

Hong Kong University of Science and Technology

Kowloon, Hong Kong

PHD CANDIDATE IN AI, IIP

2020.09 - present

- Advisor: Prof. Yuan YAO, Prof. Yangqiu SONG

Harbin Institute of Technology (Shenzhen)

Shenzhen, Guangdong, China

B.S. IN COMPUTER SCIENCE AND TECHNOLOGY

2016.09 - 2020.06

- undergrad research advisor: Prof. Buzhou TANG

Work Experience

2022-2024 **Bio-algorithm Research Intern**, XtalPi Lab, The International Digital Economy Academy (IDEA)

2022-2023 **Computer Vision Research Intern**, CVR, The International Digital Economy Academy (IDEA)

Professional Experience

2021-2022 **Graduate Teaching Assistant**, Dept. Mathematics, Hong Kong University of Science and Technology

2019 **Summer Research Assistant**, Dept. Health Outcomes and Biomedical Informatics, University of Florida

2018-2020 **Undergraduate Research Assistant**, Dept. Computer Science, Harbin Institute of Technology, Shenzhen

Publications

PUBLISHED

Xingyu Lu, *He Cao*, Zijing Liu, Shengyuan Bai, Leqing Chen, Yuan Yao, Hai-Tao Zheng, Yu Li, “MoleculeQA: A Dataset to Evaluate Factual Accuracy in Molecular Comprehension”, **arXiv preprint arXiv:2403.08192**

He Cao, Zijing Liu, Xingyu Lu, Yuan Yao, Yu Li, “InstructMol: Multi-Modal Integration for Building a Versatile and Reliable Molecular Assistant in Drug Discovery”, **arXiv preprint arXiv:2311.16208**

Jiamin Wu, *He Cao*, Yuan Yao. “Leveraging Side Information for Ligand Conformation Generation using Diffusion-Based Approaches”, **arXiv preprint arXiv:2309.16684**

Yukai Shi, *He Cao*, Jianan Wang, Boshi Tang, Xianbiao Qi, Tianyu Yang, Yukun Huang, Shilong Liu, Lei Zhang, Heung-Yeung Shum. 2023. “TOSS: High-quality Text-guided Novel View Synthesis from a Single Image” **ICLR 2024**

He Cao, Mengyuan Liu, Donghao Li, Tianhe Ren, Zeyi Liao and Jiamin Wu. 2023. “ChatCounselor: A Large Language Models for Mental Health Support” **International Workshop on Personalized Generative AI (@CIKM 2023)**.

Yukun Huang, Jianan Wang, *He Cao*, Ailing Zeng, Xianbiao Qi, Yukai Shi, Zheng-Jun Zha, Lei Zhang. 2023. “DreamWaltz: Make a Scene with Complex 3D Animatable Avatars.” **NeurIPS 2023**

Tianhe Ren, Shilong Liu, Feng Li, Hao Zhang, Ailing Zeng, Jie Yang, Xingyu Liao, Ding Jia, Hongyang Li, *He Cao*, Jianan Wang, Zhaoyang Zeng, Xianbiao Qi, Yuhui Yuan, Jianwei Yang, Lei Zhang. 2023. “detrex: Benchmarking Detection Transformers” **arXiv preprint arXiv:2306.07265**

Tianhe Ren, *He Cao*, Shilong Liu, Feng Li, Hao Zhang, Kunchang Li, Jiayu Chen, Hongyang Li, Lei Zhang “Grounded-SAM: Detect, Segment and Generate Anything.” **arXiv:2401.14159, ICCV Demo Track, 2023**

He Cao, Jianan Wang, Tianhe Ren, Xianbiao Qi, Yihao Chen, Yuan Yao, and Lei Zhang. 2022. “Exploring Vision Transformers as Diffusion Learners.” **arXiv preprint arXiv:2212.13771**

Liu, Xuanton, Jianfeng Zhang, Tianyang Hu, *He Cao*, Lujia Pan, and Yuan Yao. 2023. “Inducing Neural Collapse in Deep Long-Tailed Learning.” **AISTATS 2022**

Ying X, He Cao, Shuai C, Yedan S(2018.10). "A Hybrid System for Clinical Semantic Textual Similarity." **BioCreative/OHNLPC Challenge 2018**.

Projects

PROJECTS IN IDEA(CVR)

2023.5 **ScenarioBoost**: Using diffusion generative model to enhance autonomous driving scenarios

2023.4 **Grounded-SAM**: Marrying Grounding DINO with Segment Anything & Stable Diffusion & BLIP & Whisper & ChatGPT - Detect, Segment and Generate Anything with Image, Text and Audio Inputs. GitHub Trending Top-1 Project (2023.04), achieves more than 5k stars in 5 days.

2023.3 **DreamWaltz**: Constructing single/multi-person 3D scenes conditioned on a given pose and text description, extending DreamFusion

Spring 2022. **Hana**: an open-source library that can create realistic images and art from a textual description based on diffusion models. It mainly follows Imagen and DALL-E-2 and is built upon pytorch-lightning framework.

PROJECTS IN COLLABORATION

2023.4 **ChatPsychiatrist** A counselling chat model fine-tuning LLaMA on psychological counseling conversations. Collaborated with Laboratory of Neuropsychology and Human Neuroscience, Department of Psychology, The University of Hong Kong

2023.3 *Train data extraction from diffusion models using various sampling procedures*. Collaborated with Donghao LI(HKUST)

PROJECTS IN SCHOOL LAB

Fall 2021. *Deep learning-based protein structure prediction*. Co-work with TTIC.

Spring 2021. *Advanced Data Analytics for Abnormal Detection of Semiconductor Devices*. Innovation and Technology Fund, led by Prof.Yuan YAO