Yuqi HU

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EDUCATION BACKGROUND

University of California, Berkeley, *Berkeley Global Access (BGA) program* 07/2025 – 12/2025
Favorite Course: *CogSci 138* instructed by *Dr. Ahna Girshick* (Grade: A) UC Berkeley, Berkeley, CA

The Hong Kong University of Science and Technology
Master of Philosophy (*M.Phil.*) major in Artificial Intelligence 09/2023 – 06/2025
GPA: 3.98/4.3 (No Ranking), Supervisor: *Dr. Hui Xiong* AI Thrust, Information Hub, Guangzhou Campus, China

Shenzhen Technology University (SZTU)
Bachelor of Engineering (*B.Eng.*) major in The Internet of Things Engineering 09/2019 – 06/2023
GPA: 4.11/4.5 (2/264), Supervisor: *Dr. Yu Lu* Shenzhen, China

PUBLICATIONS (*: EQUAL CONTRIBUTION)

Yuqi, Hu*, Longguang Wang*, Xian Liu*, Ling-Hao Chen*, Yuwei Guo*, Yukai Shi*, Ce Liu*, Anyi Rao, Zeyu Wang, and Hui Xiong. "Simulating the real world: A unified survey of multimodal generative models." *arXiv preprint arXiv:2503.04641* (2025). *Submitted to IEEE TPAMI with minor revision, Github Link* *Link*

Xia, Lei, **Yuqi Hu**, Xiaomei Li, Dan Li, Siye Zeng, and Ling Fan. "Enhancing Altruistic Behavior Through Virtual Reality: The Impact of Immersive Environments and Digital Embodiment on Prosocial Tendencies." In *International Conference on Human-Computer Interaction*, pp. 245-259. Cham: Springer Nature Switzerland, 2025. *Link*

Gao, Zhangyang*, **Yuqi Hu***, Cheng Tan, and Stan Z. Li. "Prefixmol: Target-and chemistry-aware molecule design via prefix embedding." *arXiv preprint arXiv:2302.07120* (2023). *Link*

Huang, Yufei, Bangyan Liao, **Yuqi Hu**, Haitao Lin, Lirong Wu, Siyuan Li, Cheng Tan et al. "DaCapo: Score Distillation as Stacked Bridge for Fast and High-quality 3D Editing." In *Proceedings of the Computer Vision and Pattern Recognition Conference*, pp. 16304-16313. 2025. *Link*

Yuqi, Hu, and Yu Lu. "Optimal Sales Strategies for Electric Vehicles Based on Big Data Analytics." In *2022 5th International Conference on Data Science and Information Technology (DSIT)*, pp. 01-06. IEEE, 2022. *Link*

RESEARCH EXPERIENCES

Modeling Perceptual Ambiguity in AI-generated Images 07/2025 – **Present**
UC Berkeley CogSci138 & MIT Perceptual Science Group

- *Milestone*: **Yuqi Hu**, Ahna Girshick, Vasha DuTell, Ruth Rosenholtz, Jennifer Corbett, "Investigating Perceptual Ambiguity in Generative Illusion Diffusion Models" (Poster Acceptance at *Boston Diffusion Day*, Oct 17 2025). *Poster Link*
- *Pilot Study (CogSci 138)*: Explored how diffusion model prompts and hyperparameters influence perceptual ambiguity in AI-generated duck–rabbit illusions. Conducted 2AFC tasks on 264 images, revealing that prompting, guidance scale, and feature conflicts jointly modulate percept dominance and ambiguity.
- *First Experiment (IRB-Approved)*: Created a continuous α-mixed duck–rabbit image set and ran a 2AFC study with 300 Stable Diffusion stimuli and 20 participants (6,000 trials). Found smooth psychometric curves showing that higher guidance strength increases perceptual clarity, while lower guidance enhances ambiguity.

Inverse Global Mechanics (IGM): Material and Force Disentanglement 05/2024 – 05/2025
MPhil Thesis, Supervisor: *Dr. Hui Xiong*

- Designed Inverse Global Mechanics (IGM), a differentiable Material Point Method (MPM) framework for inverse mechanics, solving for shape sequences that yield target motion trajectories. Optimized external force fields to recover physical parameters between initial and final keyframes, addressing the sensitivity between shape deformation and resulting motion.
- Demonstrated that global versus local forces yield distinct deformation patterns and that IGM improves physical plausibility and temporal coherence compared to the DreamGaussian4D baseline.

Enhancing Altruistic Behavior Through Virtual Reality 09/2024 – 12/2024

- Investigated how immersion level (Animated (AEG) vs. Simulated Environment (SEG)) and digital embodiment (avatar ownership/control) influence altruistic and prosocial behavior.
- Conducted a randomized VR experiment on Oculus Quest 2 (AEG = 30, SEG = 30) using identical helping, sharing, and collaboration scenarios that differed only in visual fidelity and measured altruism at pre-, post-, and follow-up stages.
- Found that simulated environments yielded greater than realism, embodiment ($p < 0.001$) and prosocial intentions ($p < 0.05$–0.01). Demonstrated that embodiment mediates emotional engagement and sustained altruistic motivation.
- Xia, Lei, **Yuqi Hu**, Xiaomei Li, Dan Li, Siye Zeng, and Ling Fan. "Enhancing Altruistic Behavior Through Virtual Reality: The Impact of Immersive Environments and Digital Embodiment on Prosocial Tendencies." In *International Conference on Human-Computer Interaction*, pp. 245-259. Cham: Springer Nature Switzerland, 2025. *Link*

Drug Design with Molecular Property Prediction and Molecular Generation 09/2022 – 03/2023
Westlake University, Center for AI Research and Innovation (CAIRI)

- Addressed limitations in molecule generation models–balancing chemical property control, chemistry-aware models ignore binding pocket specificity, and unified multi-condition models risk negative transfer.
- Proposed *PrefixMol*, encoding pocket context and chemical properties as prefix embeddings conditioning Transformer attention;

extended CrossDocked with property annotations to enable single- and multi-condition controllable generation. Outperformed baseline structure-based models and identified inter-property couplings that enhance multi-condition controllability.
- Gao, Zhangyang*, **Yuqi Hu***, Cheng Tan, and Stan Z. Li. "Prefixmol: Target-and chemistry-aware molecule design via prefix embedding." *arXiv preprint arXiv:2302.07120* (2023). (*: Equal Contribution)   *Link*

MLOps Infrastructure and Sample Model Development for the openEuler Community   04/2022 – 09/2022
Chinese Academy of Sciences (ISCAS), Institute of Software
- Standardized AI model development pipelines, implementing two complete examples with Argo Workflow covering developer profiling, churn prediction, and R&D issue recommendation.
- Built an NLP-based issue recommendation system using BERT embeddings and pre-trained retrieval models, integrated with MindSpore's Gitee APIR for live deployment.

Optimization-based Image Denoising for Optical Coherence Tomography (OCT) Analysis   03/2022 – 06/2022
National Supercomputing Shenzhen Center
- Improved OCT image interpretability over deep learning–based and traditional filtering methods. Implemented a Total Variation model solved via Alternating Direction Method of Multipliers for convex optimization, integrating regularization and fidelity terms to preserve edges while reducing noise. Trained deep learning models for downstream ophthalmic analysis, achieving overall accuracy = 0.996 and CNV classification accuracy = 0.956.

WORKING EXPERIENCES

Institute of Software, Chinese Academy of Sciences (ISCAS) | *Software Engineer Intern (Remote)*   06/2022 – 09/2022
➢ Explored OpenStack-based open and reliable cloud computing technologies
- Constructed an RPM package, enabling version upgrade/downgrade, initializing the branch and repository, and modifying the user/group creation method.
➢ Realized and adapted hostha (the Compute High Availability feature for OpenStack) for Python3
- Implemented the adaptation and migration for hostha (providing highly available computing for OpenStack) from Python2 to Python3, and tested its performance.

SF Technology Co., Ltd. | *Big Data Mining & Analysis Engineer Intern, Network Security Department*   03/2022 – 07/2022
➢ Big Data Logs Operations Management and Monitoring   Shenzhen, China
- Monitored the logs framework and enabled different types of security log access, such as Windows/Linux server, Tencent Cloud and JumpServer logs.
- Constructed the Registry Access Event model using the Registry Access Audit log of Leagsoft EDR.

National Supercomputing Shenzhen Center | *High-Performance Computing Research Intern*   02/2022 – 03/2022
- Managed the result-based monitoring and evaluation system for Shenzhen's technology policies.   Shenzhen, China
- Deployed FFTW (version 3.3.8, a C subroutine library for computing the discrete Fourier transform) on cloud server.

EXTRACURRICULAR EXPERIENCES

[Exhibit Project] Diffraction Fields Exhibition   03/2025 – 05/2025
➢ **Meditation Workshop: Field · Sound - Diffraction and Sonification,** *Team Member*, *Project Details*   Onsite Exhibit
- Designed an immersive installation exploring digital perception, consciousness, and environmental interaction through sonification and generative AI.
- Integrated natural lighting and physiological sensors to create responsive audiovisual projections, investigating shared perception and human–AI co-awareness in real-time.

[Exhibit Project] 2023 CAA and HKUST(GZ) Interdisciplinary Design Thinking Joint Course Exhibition   06/2023 – 07/2023
➢ **MEMOREASE: Research and Design on Memory Forgetting Concerns**, *Team Member*, *Project Details*   Onsite Exhibit
- Investigated memory and mental health among the elderly participants through fieldwork across psychology, design, and computing.
- Developed interactive prototypes visualizing "traces of memory" using multimodal media (text, photo, audio, video). Curated a hybrid exhibition combining VR and physical installations to evoke nostalgia and promote intergenerational empathy.

China Mathematics Cup – National Mathematical Contest in Modeling for College Students, Individual Contestant   08/2021
➢ **Optimal Sales Strategies for Electric Vehicles (EV) Based on Big Data Analytics**, Outstanding Award (**Top 10%**)
- Conducted data preprocessing and correlation analysis to identify key determinants of EV purchase intention, developing a supervised BPNN model to achieve accurate predictions of customer decisions.
- Demonstrated that income-related variables (household, personal, and disposable income) dominate consumer decision-making, while service improvements significantly enhance conversion rates. Proposed brand-specific strategies (e.g., price discounts, trial experiences) and recommendations for promoting green concepts, aligning product design with consumer needs.
- **Yuqi, Hu**, and Yu Lu. "Optimal Sales Strategies for Electric Vehicles Based on Big Data Analytics." In *2022 5th International Conference on Data Science and Information Technology (DSIT)*, pp. 01-06. IEEE, 2022.   *Link*

AWARDS & SKILLS

China Computer Federation (CCF) Certified Software Professional (CSP) – C/C++, *Top 28.8%*   09/2021
National English Competition for College Students, *First Prize in Band C*   05/2021
3rd China Mathematics Cup, National Mathematics Competition for College Students (Non-mathematics professional group),
Excellence Award   12/2020
Scholarship: University Scholarship 2019-2022; China National Scholarship 2021-2022
Programming: C++, Python, PyTorch, C, Java, MATLAB, SQL (HiveQL, MySQL), Spark, Shell, VBA, SPSS, Git
Second Languages: English (*Proficient*, TOEFL 102 (R27, L23, S25, W27)), German (*Intermediate*, Goethe-Zertifikat A2)