Zhongqi **Yue**

BUILDING EFFICIENT AND TRUSTWORTHY AGENTS: POST-TRAINING │ MULTIMODAL MODELS │ CAUSAL INFERENCE

18+ top-tier publications (NeurIPS, ICLR, CVPR, ICCV), with 40% oral/highlight selections.

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Research Summary

My research lies at the intersection of *post-training for LLMs*, *multimodal LLMs*, and *causal inference*.

- My most recent project EARL proposes a new paradigm for post-training LLMs with external environments, which decouples environment interactions from language by internalizing them in an expanded action space.
- I proposed a diffusion-based unsupervised representation learning method (ICLR 2024) and subsequently pioneered the Selftok image tokenizer (**CVPR 2025 best student paper honorable mention**). I supervised multimodal data generation/selection (multiple **oral/highlight** papers), and directed large-scale multimodal LLMs pre-training and post-training on 300+ GPUs (technical report).
- Previously, I studied disentangled representation learning through contrastive objectives, and explored machine generalization problems (*e.g.*, zero-/few-shot learning, domain adaptation) from a causal perspective.

Professional Experience

Wallenberg-NTU Presidential Postdoctoral Fellowship　　　　　*Singapore & Sweden*
PRINCIPAL INVESTIGATOR　　　　　*01.2024-02.2026 (Expected)*
- 2024 - 2025: with Prof. Hanwang Zhang at MReal Lab, Nanyang Technological University
- 2025 - 2026: with Assoc. Prof. Fredrik D. Johansson at Healthy AI Lab, Chalmers University of Technology

Sea AI Lab (SAIL)　　　　　*Singapore*
RESEARCH INTERN　　　　　*10.2023 - 12.2023*
- Supervisor: Asst Prof. Pan Zhou

Alibaba-NTU Singapore Joint Research Institute　　　　　*Singapore*
ALIBABA PHD STUDENT　　　　　*08.2019 - 08.2023*
- Advisor: Xian-Sheng Hua (IEEE Fellow)

Nanyang Technological University　　　　　*Singapore*
PH.D IN COMPUTER SCIENCE　　　　　*08.2019 - 12.2023*
- Advisor: Prof. Hanwang Zhang
- Thesis: Causal View of Generalization

Selected Publications

Expanding the Action Space of LLMs to Reason Beyond Language
Zhongqi Yue*, Weishi Wang*, Yundaichuan Zhan, Juncheng Li, Daniel Dahlmeier, Fredrik D. Johansson
NeurIPS 2025 Math-AI

Generative Multimodal Pretraining with Discrete Diffusion Timestep Tokens
Kaihang Pan*, Wang Lin*, **Zhongqi Yue***, Tenglong Ao, Liyu Jia, Wei Zhao, Juncheng Li, Siliang Tang, Hanwang Zhang
CVPR 2025, **Best Student Paper Honorable Mention** 7/13008

Selftok: Discrete Visual Tokens of Autoregression, by Diffusion, and for Reasoning
Bohan Wang, **Zhongqi Yue**, Fengda Zhang, S. Chen, Li'an Bi, J. Zhang, Xue Song, Kennard Yanting Chan, Jiachun Pan, Weijia Wu, Mingze Zhou, Wang Lin, Kaihang Pan, Saining Zhang, Liyu Jia, Wentao Hu, Wei Zhao, Hanwang Zhang
Technical Report 2025, Technical Lead

Object Fusion via Diffusion Time-step for Customized Image Editing with Single Example
Xue Song, **Zhongqi Yue**, Jiequan Cui, Hanwang Zhang, Jingjing Chen, Yu-Gang Jiang
AAAI 2026, **Oral** Presentation

When are Radiology Reports Useful for Training Medical image Classifiers?
Herman Bergström, **Zhongqi Yue**, Fredrik D. Johansson
EurIPS 2025 MMRL4H **Best Paper** & *MedEurIPS* **Oral** Presentation

Mastering Collaborative Multi-modal Data Selection
Qifan Yu*, Zhebei Shen*, **Zhongqi Yue***, Yang Wu, W. Zhang, Y. Li, Juncheng Li, Siliang Tang, Yueting Zhuang
ICCV 2025, **Highlight** 262/11239

AnyEdit: Mastering Unified High-quality Image Editing for Any Idea
Qifan Yu*, Wei Chow*, **Zhongqi Yue***, Kaihang Pan, Y. Wu, X. Wan, Juncheng Li, S. Tang, Hanwang Zhang, Yueting Zhuang
CVPR 2025, **Oral** Presentation 96/13008

Exploring Diffusion Time-steps for Unsupervised Representation Learning
Zhongqi Yue, Jiankun Wang, Qianru Sun, Lei Ji, Eric I-Chao Chang, Hanwang Zhang
ICLR 2024

Self-Supervised Learning Disentangled Group Representation as Feature
Tan Wang, **Zhongqi Yue**, Jianqiang Huang, Qianru Sun, Hanwang Zhang
NeurIPS 2021, **Spotlight** Presentation 260/9122; *2022 PREMIA* **Best Paper**

Transporting Causal Mechanisms for Unsupervised Domain Adaptation
Zhongqi Yue, Qianru Sun, Xian-Sheng Hua, Hanwang Zhang
ICCV 2021, **Oral** Presentation 210/6236

Other Publications

Selftok-Zero: Reinforcement Learning for Visual Generation via Discrete and Autoregressive Visual Tokens
Bohan Wang, Mingze Zhou, **Zhongqi Yue**, Wang Lin, Kaihang Pan, Liyu Jia, Wentao Hu, Wei Zhao, Hanwang Zhang
NeurIPS 2025

Counterfactual Evolution of Multimodal Datasets via Visual Programming
Minghe Gao*, **Zhongqi Yue***, W. Yan, Y. Hu, Wei Ji, Siliang Tang, Jun Xiao, Tat-Seng Chua, Yueting Zhuang, Juncheng Li
NeurIPS 2025

Benchmarking Multimodal CoT Reward Model Stepwise by Visual Program
Minghe Gao, Xuqi Liu, **Zhongqi Yue**, Y. Wu, S. Chen, Juncheng Li, Siliang Tang, Fei Wu, Tat-Seng Chua, Yueting Zhuang
ICCV 2025

Few-shot Learner Parameterization by Diffusion Time-steps
Zhongqi Yue, Pan Zhou, Richang Hong, Hanwang Zhang, Qianru Sun
CVPR 2024

Make the U in UDA Matter: Invariant Consistency Learning for Unsupervised Domain Adaptation
Zhongqi Yue, Qianru Sun, Xian-Sheng Hua, Hanwang Zhang
NeurIPS 2023 (WILDS 2.0 Leaderboard 1st Place)

Invariant Feature Regularization for Fair Face Recognition
Jiali Ma, **Zhongqi Yue**, Tomoyuki Kagaya, Tomoki Suzuki, Karlekar Jayashree, Sugiri Pranata, Hanwang Zhang
ICCV 2023

Random Boxes are Open-world Object Detectors
Yanghao Wang, **Zhongqi Yue**, Xian-Sheng Hua, Hanwang Zhang
ICCV 2023

Unbiased Multiple Instance Learning for Weakly Supervised Video Anomaly Detection
Hui Lv, **Zhongqi Yue**, Qianru Sun, Bin Luo, Zhen Cui, Hanwang Zhang
CVPR 2023

Counterfactual Zero-Shot and Open-Set Visual Recognition
Zhongqi Yue*, Tan Wang*, Qianru Sun, Xian-Sheng Hua, Hanwang Zhang
CVPR 2021

Interventional Few-Shot Learning
Zhongqi Yue, Hanwang Zhang, Qianru Sun, Xian-Sheng Hua
NeurIPS 2020

Grants & Scholarships

2024-2026	**Wallenberg-NTU Presidential Postdoctoral Fellowship Grant**, (SGD$100,000)
2019-2023	**Alibaba Talent Program Scholar**, Alibaba Cloud
2015-2016	**NTU President Research Scholar**, Nanyang Technological University
2011-2017	**MOE SM2 Scholoar** (200 candidates annually in China), MOE Singapore
2018	**Certified SCRUM Master**, SCRUM Alliance
2018	**AWS Certified Solution Architect & Developer**, Amazon Web Services
2017	**Shape The Future Global Innovation Winner** (2/300), Tata Communications
2017	**AWS Hack Day 2017 2nd Prize**, Amazon Web Services
2015-2017	**Dean's List and Academic Excellence Award**, Nanyang Technological University

Teaching Experience

Sem 1, AY2025-26	**Neuro-Symbolic AI**, Guest Lecturer	*Chalmers*
Sem 1, AY2023-24	**Algorithm Design and Analysis**, Assistant Lecturer	*NTU*
Sem 2, AY2022-24	**Artificial Intelligence**, Teaching Assistant	*NTU*
Sem 1, AY2021-22	**Microprocessor System Design and Development**, Teaching Assistant	*NTU*

Mentoring and Supervision

Herman Bergström (PhD candidate at Chalmers, 2025)

Now PhD student at Chalmers

- Supervised method and experimental designs for the medical imaging paper.

Xue Song (Visiting PhD student at NTU, 2024-2025)

Now researcher at Huawei, Singapore

- Supervised method and experimental designs for AAAI 2026 paper.

Jiankun Wang (Visiting master student at NTU, 2023-2024)

Now PhD at University of Illinois at Urbana-Champaign

- Supervised method and experimental designs for ICCV 2023 paper.

Yanghao Wang (Visiting master student at NTU, 2023)

Now PhD at Hong Kong University of Science and Technology

- Supervised method and experimental designs for ICCV 2023 paper.

Hui Lv (Visiting PhD student at NTU, 2022-2023)

Now lecturer at Nanjing Normal University

- Supervised method and experimental designs, project management for CVPR 2023 paper.

Tan Wang (PhD student at NTU, 2020-2021)

Now at Meta

- Co-author on CVPR 2021 paper.
- Supervised method and experimental designs for NeurIPS 2021 paper.

Academic Services

Invited Talks

2025. *Post-training LLM Agents with Expanded Action Space.* Invited talk at DSAI seminar, Chalmers.

2025. *Generative Multimodal Pretraining with Discrete Diffusion Timestep Tokens.* Oral presentation at CVPR.

2025. *AnyEdit: Mastering unified high-quality image editing for any idea..* Oral presentation at CVPR.

2025. *Large Language Models: How Machines Learned to Talk and Think*. Invited talk at Huawei Singapore Research Center.

2025. *The Rise of Multimodal LLM: How Machines Learned to See and Draw*. Invited talk at Huawei Singapore Research Center.

2024. *Tokenizer is Key to Next-Gen AR Modelling*. Invited talk at Huawei Singapore Research Center.

2024. *Visual Autoregressive Modelling*. Invited talk by NUS NExT Research Centre.

2024. *Visual Autoregressive Modelling*. Invited talk by Skywork AI.

2021. *Interventional Learning*. Invited talk by the Lab for Media Search (LMS) in NUS and NExT Research Centre.

2020. *Interventional Few-Shot Learning*. Invited talk by Jiantao Jiao's Lab in UC Berkeley.

PEER REVIEW

Conference & journal reviewer for NeurIPS, CVPR, ICCV, ICML, UAI, ECCV, IJCAI, ACM MM, TPAMI, TMLR, IJCV, T-RO.

Skills

Recently Used: Python, PyTorch, Tensorflow, LaTeX;

Previously Used: C++, Java, Javascript, Frontend & backend development.

References

Prof. Hanwang Zhang (NTU): hanwangzhang@ntu.edu.sg

Assoc. Prof. Qianru Sun (SMU): qianrusun@smu.edu.sg

Assoc. Prof. Fredrik D. Johansson (Chalmers University of Technology): fredrik.johansson@chalmers.se

Outreach & Professional Development

2017	**Guest performer**, NTU Guitar Ensemble Annual Concert
2016	**Organizer**, Oversea Visit to NTU and NTNU in Taiwan
2015	**President**, NTU Cultural Activities Club, Harmonica Band
2013	**Team Leader**, Volunteering for Singapore School for the Deaf