

# Zhongqi Yue

BUILDING TRUSTWORTHY MULTIMODAL AGENTS: POST-TRAINING | MULTIMODAL MODELS | CAUSAL INFERENCE

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

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## Research Summary

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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 150+ 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

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### 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

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### 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 & MedEurIPS, **Oral Presentation (Both Workshops)**

## **Mastering Collaborative Multi-modal Data Selection**

Qifan Yu\*, Zhebei Shen\*, **Zhongqi Yue\***, Yang Wu, W. Zhang, Y. Li, Juncheng Li, Siliang Tang, Yueling 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, Yueling 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**

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### **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, Yueling 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, Yueling 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

## Academic Services

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### 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.

### TEACHING EXPERIENCE

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

### PEER REVIEW

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

## Awards & Scholarships

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- 2024-2026 **Wallenberg-NTU Presidential Postdoctoral Fellow**, NTU & WASP
- 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

## Skills

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**Recently Used:** Python, PyTorch, Tensorflow,  $\text{\LaTeX}$ ;

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