

# WENTAO HU

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## EDUCATION

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**Nanyang Technological University (QS15)**

Jul. 2023 – Nov. 2025 (*expected*)

M.Eng in Computer Science and Engineering (By Research)

GPA: 3.83/5.0

Advisor: [Prof. Hanwang Zhang](#)

**Hunan University (Project 985)**

Sep. 2019 – June. 2023

B.Sc in Statistics

GPA: 3.55/4.0

## RESEARCH INTERESTS

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Image Generation, Multimodal Large Language Model

## PUBLICATIONS

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### First-/Co-first Author Publications

1. Wang Lin\*, **Wentao Hu\***, Liyu Jia, Kaihang Pan, Zhang Majun, Zhou Zhao, Fei Wu, Jingyuan Chen, Hanwang Zhang

*Vinci: Deep Thinking in Text-to-Image Generation using Unified Model with Reinforcement Learning*  
The Conference on Neural Information Processing Systems (**NeurIPS 2025**). (*\*Co-first authors*)

2. Wang Lin\*, Liyu Jia\*, **Wentao Hu\***, Kaihang Pan, Zhongqi Yue, Wei Zhao, Jingyuan Chen, Fei Wu, Hanwang Zhang

*Reasoning Physical Video Generation with Diffusion Timestep Tokens via Reinforcement Learning*  
Under Review (2025). (*\*Co-first authors*)

### Other Publications

1. Bohan Wang, Mingze Zhou, Zhongqi Yue, Wang Lin, Kaihang Pan, Liyu Jia, **Wentao Hu**, Wei Zhao, Hanwang Zhang

*Selftok: Discrete Visual Tokens of Autoregression, by Diffusion, and for Reasoning*  
The Conference on Neural Information Processing Systems (**NeurIPS 2025**).

2. Hao Fei, Yuan Zhou, Juncheng Li, ..., **Wentao Hu**, Jiebo Luo, Tat-Seng Chua, Shuicheng Yan, Hanwang Zhang

*On Path to Multimodal Generalist: Levels and Benchmarks*  
The International Conference on Machine Learning (**ICML 2025**).

## RESEARCH EXPERIENCE

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**Huawei Central Media Technology Institute, 2012 Laboratory**

Aug. 2024 - Present

*Research Intern*

Singapore

Supervisor: *Prof. Hanwang Zhang*

### Autoregressive Video Generation with Reinforcement Learning

Aug. 2024 - Mar. 2025

- **Background:** Existing video generation models struggle to adhere to physical laws.
- **Method:** We analyze the limitations of current spatial tokenizers in autoregressive models; train an autoregressive model with a DDT tokenizer; And apply GRPO for reinforcement learning-based fine-tuning, enabling symbolic reasoning in the visual domain and thus achieving physical extrapolation.

- **Results:** We achieve near-perfect out-of-distribution prediction across three basic motion types (uniform motion, parabola, and collision).
- **My Involvement:** Conducted an extensive literature review on video generation model. Participated in the experimental design. Based on the phyworld dataset, curated and constructed a custom dataset designed to simulate real-world physical dynamics. Built a training and evaluation framework on both GPU and NPU using Megatron-LM, MindSpeed-LLM. Also took part in writing the paper.

#### Selftok: Discrete Visual Tokens of Autoregression

Aug. 2024 - Present

- **Background:** Traditional Tokenizers often rely on spatial priors or continuous representations, which have limitations in effectively supporting reinforcement learning and integrating seamlessly with LLMs.
- **Method:** We propose Selftok. It addresses these challenges by leveraging the reverse diffusion process to create discrete AR tokens.
- **Results:** Our VLM based on Selftok tokens achieve both SOTA visual comprehension and generation performances.
- **My Involvement:** Conducted the development of an inference and evaluation pipeline for the tokenizer, enabling automatic evaluation and inference on both NPU and GPU. Participated in the design and implementation of part of ablation experiments. Explored and built an AR training framework for selftok tokens. Curated and constructed a large-scale high-resolution dataset for training.

#### National University of Singapore

Apr. 2024 - Dec. 2024

Research Intern

Singapore

#### A Benchmark of Multimodal Large Language Model

- **Background:** The evaluation method which assumes that better performance across various tasks implies stronger capabilities is not the best choice for evaluating MLLMs.
- **Method:** We propose a General-Level framework, to assess the performance and generality of MLLMs across five levels. Central to this framework is the concept of Synergy, which categorizes capabilities based on whether MLLMs preserve synergy across comprehension, generation, and multimodal interactions.
- **Results:** We present General-Bench, a massive-ever multimodal benchmark encompassing a broader spectrum of skills, modalities, formats, and capabilities, with over 700 tasks and 325,800 instances. The evaluation results, involving over 100 state-of-the-art MLLMs.
- **My Involvement:** Collected and curated 40 datasets spanning multiple areas of image comprehension, including image classification, image segmentation, and OCR-based Visual Question Answering (VQA), etc. Then conducted performance evaluations of these datasets on 10 state-of-the-art multimodal large language models, such as GPT-4o and Qwen2-VL-7B. Finally evaluated their performance according to the 5 levels we set, systematically categorizing and assigning each model to an appropriate performance level based on the evaluation results.

## ACHIEVEMENTS

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CUMCM, Provincial Second Prize

Summer 2022

## SKILLS

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Language

Mandarin(native), English(IELTS: 6.5, GRE: 330)

Programming Languages

Python, MATLAB, R, C++