Yuhao Shen

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Education

The Chinese University of Hong Kong, Shenzhen Shenzhen, China
Master of Philosophy in Computer Science Sept. 2025 – Jun. 2027

- **Advisor:** *Prof. Juexiao Zhou*
- **Research Interests:** *AI for Healthcare, Natural Language Processing and Medical Imaging*

Hangzhou Dianzi University Hangzhou, China
Bachelor of Engineering in Computer Science and Technology Sept. 2021 – Jun. 2025

- **Advisor:** *Prof. Renshu Gu* and *Fangli Guan*; ***GPA: 3.76/4 (Top 10%)***

Selected Work

SkinGPT-R1: Adapter-Only Dual Distillation for Efficient Dermatology Reasoning

- Developed **SkinGPT-R1**, a dermatology-focused VLM that produces explicit, step-by-step and verifiable diagnostic chain-of-thought from clinical skin images.
- Constructed **DermCoT** (10,000 DermEval-filtered training cases + 3,000 dermatologist-certified cases) and introduced **DermEval** and **DermBench** as a six-dimensional, clinician-aligned evaluation suite.
- On DermBench, achieved **4.031/5** and **1st out of 14** VLMs with a **41%** gain over Vision-R1, while maintaining stable accuracy gains on three dermatology classification benchmarks.

CoTBox-TTT: Grounding Medical VQA with Visual Chain-of-Thought Boxes During Test-time Training

- Studied reliability gaps in medical VQA where models fail under domain shift and attend to spurious image regions, limiting safe use in clinical decision support.
- Proposed **CoTBox-TTT**, an evidence-first *test-time training* scheme that keeps all backbones frozen, updates only a small set of **continuous soft prompts**, and uses visual chain-of-thought boxes plus answer-consistency between full images and localized crops to enforce grounding.
- Showed that CoTBox-TTT is **label-free** and plug-and-play across VLM backbones, and that adding it to LLaVA improves closed-ended accuracy by **12.3%** on PathVQA while increasing robustness under domain shift.

SkinCaRe: A Multimodal Dermatology Dataset Annotated with Medical Caption and Chain-of-Thought Reasoning

- **SkinCaRe Dataset Release:** Released the SkinCaRe multimodal dermatology resource (7,041 expert cases), unifying **SkinCAP** (4,000 images with medical captions) and **SkinCoT** (3,041 clinician-verified, hierarchical CoT narratives).
- **Core Value and Objective:** Addressed the lack of rich natural language and concept-level labels in dermatology by providing trustworthy data for training VLLMs that can both **describe and explain** diagnostic reasoning, enhancing interpretability.

Towards Trustworthy Dermatology MLLMs: A Benchmark and Multimodal Evaluator for Diagnostic Narratives

- Built **DermBench** and **DermEval**, clinically grounded frameworks to evaluate multimodal large language models on dermatology image–text reasoning across six diagnostic dimensions.
- Curated 4,000 dermatologist-verified image–narrative pairs and trained a reference-free evaluator aligned with physician scores using reinforcement learning with an EMA baseline.

Publication

Conferences

1. **Yuhao Shen**, Jiahe Qian, Zhangtianyi Chen, Yuanhao He, Juexiao Zhou. (2025) *SkinGPT-R1: Adapter-Only Dual Distillation for Efficient Dermatology Reasoning.*
Under review at CVPR 2026.

2. **Yuhao Shen**, Jiahe Qian, Shuping Zhang, Zhangtianyi Chen, Tao Lu, Juexiao Zhou*. (2025) *Towards Trustworthy Dermatology MLLMs: A Benchmark and Multimodal Evaluator for Diagnostic Narratives. arXiv: 2511.09195*
Under review at ICLR 2026.

3. Jiahe Qian, **Yuhao Shen**, Zhangtianyi Chen, Juexiao Zhou, Peisong Wang. (2025) *CoTBox-TTT: Grounding Medical VQA with Visual Chain-of-Thought Boxes During Test-time Training.*
Under review at CVPR 2026.

4. **Yuhao Shen**. (2024) *Exploring Generalization Capability of U-Net Architecture through Domain Adaptation.* International Conference on Artificial Intelligence and Communication ***(ICAIC 2024)***.

5. **Yuhao Shen**, Xiyan Huang. (2024) *A Comparative Visualization Analysis of Neural Network Models using Grad-CAM.* CompTech: Conference Covering Computer Science and Information Technology ***(CSI 2024)***.

Journals

1. **Yuhao Shen**, Liyuan Sun, Yan Xu, Wenbin Liu, Shuping Zhang, Shawn Afvari, Zhongyi Han, Jiaoyan Song, Yongzhi Ji, Tao Lu, Xiaonan He, Xin Gao, Juexiao Zhou. (2025) *SkinCaRe: A Multimodal Dermatology Dataset Annotated with Medical Caption and Chain-of-Thought Reasoning. arXiv: 2405.18004*.
Under review at Scientific Data.

2. Ce Shen, Shuiming Wang, **Yuhao Shen**, Shuai Ye. (2023) *Research and Application of 3D Point Cloud Matching Algorithm Based on Machine Vision in Real Time Detection of Bulk Materials.*
Automation Applications.

Patents

1. *Machine vision universal image browser system.* (2023SR1244870)
2. *A dock production management system based on big data.* (CN115936373A)
3. *A laser detection method for port machine equipment.* (CN117970367A)

Internship Experience

The Chinese University of Hong Kong, Shenzhen
Research Assistant Mar. 2025 – May. 2025

- Reproduced **LiteMedSAM** and set up a full promptable segmentation pipeline from data preprocessing to inference; standardized the HAM10000 workflow by producing aligned masks and classification labels for multi-task training.
- Designed a ViT-enhanced **EViT-UNet** for joint segmentation and classification, integrating transformer modules into the encoder to strengthen global context and improve model robustness and accuracy.

XiDian University Hangzhou Institute of Technology
Research Assistant Jul. 2023 – Sept. 2023

- Developed a real-time 3D point-cloud pose estimation algorithm for cluttered, occluded bulk materials, combining point-to-point features with viewpoint-aligned normal optimization.
- Built and deployed an end-to-end object grasping system based on the above algorithm, integrating 3D perception and planning to achieve reliable performance on real hardware.

Award

HDU Outstanding Graduate Student	Jun. 2025
HDU Campus Volunteer Star in 2024	May. 2024
Outstanding Volunteer in 19th Hangzhou Asian Games	Dec. 2023
HDU First-class Scholarship	Jun. 2023 & Jan. 2024
Zhejiang Provincial Government Scholarship	Oct. 2022
HDU Second-class Scholarship	Feb. 2022 & Oct. 2022

Leadership & Extracurricular Experience

President at **HDU Volunteer Association** May 2023 - May 2024

- Being responsible for the whole university's volunteer organization and recruitment for many large competitions such as Hangzhou Asian Games, World Internet Conference, etc., and arranged interviews for more than 10,000 people and organized service for more than 3,000 sessions.

Volunteer Team Leader at **The 19th Asian Games Hangzhou 2022** Sept. 2023 - Nov. 2023

- Serving at Information Technology Command Centre (ITCC) of the Hangzhou Asian Games, look for potential problems in metadata, synchronization, and presentation through information transportation in AIGC.