Wenxin Ma

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Introduction

I am a master's student in University of Science and Technology of China, advised by Prof. S.Kevin Zhou, an IEEE Fellow. I am also a visiting student at CCVL lab of Johns Hopkins University, collaborating with Ph.D. candidate Jeineng Chen, under the supervision of Prof. Alan Yullie. Prior to this, I completed my undergraduate studies in the Zhiyuan Honored Program at Shanghai Jiao Tong University.

My current research specializes in *3D Spatial Reasoning, Robust AI*, and *AI in medical applications*.

Education

Visiting Scholar: Johns Hopkins University, Whiting School of Engineering   April 2025 – Present

- Research Topic: 3D Spatial Reasoning, AIGC

Master of Science: University of Science and Technology of China (USTC),   Sept 2023 – Present
Biomedical Engineering

- Weighted Average Score: 90.7/100 (Top 5%)
- Coursework(Score): Medical Imaging Computing, Advanced Computer Architecture, Computer Vision

Bachelor: Shanghai Jiao Tong University (SJTU), Biomedical Science in Zhiyuan   Sept 2019 – June 2023
Honored Program

- Weighted Average Score: 88.6/100
- Coursework(Score): *Honored Course* Linear Algebra(88), *Honored Course* Mathematical Analysis(89), Probability and Statistics(100), Data Structure(96)

Honor

China National Scholarship by Chinese Ministry of Education (Top 0.2%)	Nov 2024
Outstanding Student Scholarship(Grade 1) by USTC (Top 30%)	Oct 2023, 2024
Zhiyuan Honored Scholarship by SJTU (Top 5%)	Nov 2019 to 2023

Publications and Contributions

AA-CLIP: Enhancing Zero-shot Anomaly Detection via Anomaly-Aware CLIP   CVPR2025

Wenxin Ma, Xu Zhang, Qingsong Yao, ..., Zihang Jiang, S.Kevin Zhou

Contribution: project leadership, model research, pipeline idea, coding, and writing

- Through preliminary experiments, I discovered the problem of anomaly-unawareness in CLIP. Accordingly, I designed a two-stage training strategy to encode anomaly-aware information into the original CLIP.
- I succeeded in overcoming catastrophic forgetting problem during adaptation, by incorporating residual adapters into CLIP which boost zero-shot anomaly detection performance without compromising the model's generalization ability.

Pre-Trained LLM Is A Semantic-Aware and Generalizable Segmentation Booster   MICCAI2025

*Wenxin Ma**, Fenghe Tang*, Zihang Jiang, S.Kevin Zhou

Contribution: model research, pipeline idea, comparison experiments, and writing

- I proposed to use a LLM block in medical segmentation model and completed the design and implementation.
- I proposed the possibility that the LLM layer can understand visual semantics and facilitate CNN modeling, supported by visualization analysis and statistic analysis.
- We have proven the robustness of this design, using different LLM layers including LLaMA and DeepSeek.

Towards Accurate Unified Anomaly Segmentation   WACV2025 Oral

Wenxin Ma, Qingsong Yao, ..., Zihang Jiang, S.Kevin Zhou

Contribution: project leadership, model research, pipeline idea, coding, and writing

- Based on thorough analysis of previous work, I explored uncovered false positive issues in inflated AUROC scores reported in previous works.
- I enhanced the model design to detect diverse anomalies by introducing a novel approach using sample-aware memory queries, which improved the learning of generalizable anomaly semantics. Furthermore, I developed a hybrid architecture combining transformers and CNNs to enhance low-level segmentation performance. Extensive experimental evaluations demonstrated significant improvements in segmentation accuracy.

A General Knowledge Injection Framework for ICD Coding   ACL2025 (Findings)
Xu Zhang, Kun Zhang, *Wenxin Ma*, ..., S.Kevin Zhou
Contribution: model research, pipeline idea discussion, and writing

Hi-End-MAE: Hierarchical encoder-driven masked autoencoders are stronger   MIA Major Revision
vision learners for medical image segmentation
Fenghe Tang, Qingsong Yao, *Wenxin Ma*, Chenxu Wu, Zihang Jiang, S.Kevin Zhou
Contribution: model research, pipeline idea discussion, writing, and revision

NLR2ENN: Non-Linear Redundancy-Removing Evidential Neural Network   Under Review
for near-Out-Of-Distribution Detection
Wenxin Ma*, Zhelong Huang*, Chenxu Wu, Qingpeng Kong, Xueming Fu, Xu Zhang, S.Kevin Zhou
Contribution: model research, pipeline idea, comparison experiments, and writing

- We summarized previous methods and identified the suboptimal redundancy modeling. Consequently, we proposed a simple yet effective non-linear strategy, namely Non-Linear Redundancy-Removing Evidential Neural Network to model and remove redundant evidence with high flexibility.

Histomorphology-driven multi-instance learning for breast cancer WSI   Under Review
classification
Baizhi Wang, Rui Yan, *Wenxin Ma*, ...,Xu Zhang,S.Kevin Zhou
Contribution: model research, pipeline idea, and writing

Experience

Reviewer: Medical Image Analysis
Patent: A System for Unsupervised Anomaly Detection   Sep 2023 - Present
TA: Special Topic on Biomedical Engineering and Technological Innovation   Sep 2024 – Present
TA: Frontiers of Electronic Information   Sep 2023 – Jan 2024

Skills

Coding: Proficient in Python (including deep learning frameworks), intermediate in C++
Language: TOEFL 106 (R 28, L 28, S 23, W 27)

Brief SOP and Future Plan

My journey into computer science began unexpectedly. As a medical student, I discovered AI during a course and was immediately captivated. This curiosity led me to pursue CS-related courses, where I met my current supervisor and started my master's journey under his supervision.

With the guidance of my advisor and driven by a deep curiosity, I have built a strong foundation in deep learning algorithms and gained hands-on experience in designing, implementing, and refining AI models. Tackling complex challenges and working with state-of-the-art tools has sharpened my practical skills and deepened my passion for advancing the field. Along the way, I've been fortunate to collaborate with many talented individuals, whose insights and dedication have further enriched my journey.

Looking back, I'm proud to have demonstrated strong self-learning abilities and made substantial progress in my academic and research journey. Looking ahead, I plan to pursue **a Ph.D. starting in Fall 2026**. I am eager to contribute to meaningful advancements in this transformative field and to collaborate with passionate researchers to drive innovation forward.