Juncheng WU

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EDUCATION

Tongji University 09/2020-06/2024
Bachelor's Degree in Computer Science and Technology
- **Overall GPA**: 3.97/4.00.

University of California, Santa Cruz 06/2024-Present
Ph.D Student in Computer Science and Engineering

RESEARCH INTEREST

Foundation models, Large language models, Vision-language models, Generative AI for healthcare

PUBLICATIONS

EpiFoundation: A Foundation Model for Single-Cell ATAC-seq via Peak-to-Gene Alignment
Juncheng Wu, Changxin Wan, Zhicheng Ji, Yuyin Zhou, Wenpin Hou.
In Submission to the Forty-Second International Conference on Machine Learning **(ICML 2025).**

DDR: Exploiting Deep Degradation Response as Flexible Image Descriptor
Juncheng Wu, Zhangkai Ni, Hanli Wang, Wenhan Yang, Yuyin Zhou, Shiqi Wang.
Accepted to the Thirty-Eighth Annual Conference on Neural Information Processing Systems **(NeurIPS 2024)**.

A Preliminary Study of o1 in Medicine: Are We Closer to an AI Doctor?
Yunfei Xie*, **Juncheng Wu***, Haoqin Tu*, Siwei Yang*, Bingchen Zhao, Yongshuo Zong, Qiao Jin, Cihang Xie, Yuyin Zhou.
arXiv preprint.

MedTrinity-25M: A Large-scale Multimodal Dataset with Multigranular Annotations for Medicine
Yunfei Xie*, Ce Zhou*, Lang Gao*, **Juncheng Wu***, Xianhang Li, Hong-Yu Zhou, Sheng Liu, Lei Xing, James Zou, Cihang Xie, Yuyin Zhou
Accepted to the Thirteenth International Conference on Learning Representations **(ICLR 2025).**

Restorer: Removing Multi-Degradation with All-Axis Attention and Prompt Guidance
Jiawei Mao, **Juncheng Wu**, Yuyin Zhou, Xuesong Yin, Yuanqi Chang.
In Submission to the Forty-Second International Conference on Machine Learning **(ICML 2025).**

Misalignment-Robust Frequency Distribution Loss for Image Transformation
Zhangkai Ni, **Juncheng Wu**, Zian Wang, Wenhan Yang, Hanli Wang, Lin Ma
Accepted to the IEEE/CVF Conference on Computer Vision and Pattern Recognition 2024 **(CVPR 2024).**

RESEARCH EXPERIENCES

Real-world Low-level Vision - *Project Leader, Supervisor: Zhangkai Ni and Yuyin Zhou* 10/2022-08/2024
- Worked on **building metrics and models for real-world low-level computer vision tasks.**
- Designed and implemented **multi-modal** algorithms for low-level vision.
- One paper accepted by **CVPR 2024.**
- One paper accepted by **NeurIPS 2024.**

Foundation Model for Biomedical- *Key Participant,, Supervisor: Yuyin Zhou* 04/2024-Present
- Worked on **benchmarks for biomedical foundation models.**
- Proposed a pipeline to generate multigranular annotations for unpaired medical image.
- Benchmarked performance of Large Language Models (LLMs) as biomedical foundation models.
- One papers accepted by **ICLR 2025.**

Foundation Model for single cell ATAC-seq- *Project Leader, Supervisor: Yuyin Zhou* 08/2024-Present
- Worked on **foundation model for single-cell assay for transposase-accessible chromatin (sc-ATAC).**
- Designed an unsupervised training framework for single cell ATAC-seq.
- One papers in submission to **ICML 2025.**

Medical Reasoning Dataset- *Project Leader, Supervisor: Yuyin Zhou* 01/2025-Present

- Worked on **generation of high-quality medical reasoning path.**
- Designed data generation pipeline by utilizing agent system to distill expertise knowledge from pre-built Knowledge Graph (KG).
- Model (based on Llama3-8B) fine-tuned on proposed dataset achieves **comparable performance to openai o3-mini.**

Medical Reasoning Benchmark- *Project Leader, Supervisor: Yuyin Zhou* 02/2025-Present

- Step-by-step evaluated reasoning LLMs on challenging clinical datasets, **encompassing training-objective, data filtering, and test-time scaling dimensions**.
- Designed evaluation pipeline, including each evaluating dimension, step-by-step metrics.

ACADEMIC SERVICES

Reviewer for NeurIPS 2024, ICLR 2025, AISTATS 2025, ICML 2025