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Zedong Wang

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Citations: **92**, H-index: **4**   Contribute: **3**, Stars: **1.2k**

▬▬▬ Short Biography

This is Zedong Wang, a Hong Kong-born AI researcher. I am currently a research intern at The Hong Kong University of Science and Technology (HKUST), advised by Prof. Dan Xu. Previously, I was a visiting student at Westlake University, advised by Chair Prof. Stan Z. Li (IEEE Fellow, IAPR Fellow). My research interests now center around Computer Vision, Multi-modal Learning, and Multi-task Scene Understanding. I received my B.Eng. degree in Electronic and Information Engineering from Huazhong University of Science and Technology (HUST), in June 2023. At HUST, I have been fortunate to work on few-shot semantic segmentation under the supervision of Prof. Xinggang Wang. During my B.Eng., I have also interned at SIAT-MMLab, Shenzhen Institute of Advanced Technology (SIAT), Chinese Academy of Sciences (CAS).

▬▬▬ Education and Degrees

2019 – 2023 **B.Eng. in Electronic and Information Engineering,** *Huazhong University of Science and Technology.*
- Multiple High Quality Computer Vision Research Experience | **Undergrad Supervisor: Prof. Xinggang Wang**.
- **Graduation Thesis:** Efficient Visual Backbone Architecture Design | **Grade: 92/100 (1st-Tier, Full Novelty Scores)** **Advisor: Prof. Xinggang Wang**
- Undesirable overall GPA but **high** in all **AI-related** core courses (**90.0/100**): Introduction to Green Communications (**95/100**), Engineering Training (**94/100**), Multimedia Retrieval (**93/100**), Graduation Thesis (**92/100**), Software Project (**92/100**), Principles & Applications of Sensors (**90/100**), Python Programming (**87/100**), Capstone Project in Machine Intelligence (**87/100**), Deep Learning & Computer Vision (**87/100**), Machine Learning (**85/100**).

▬▬▬ Research Experience (**Links** are provided)

Mar. 2024 *Please Visit My Homepage for More Details and The Latest Updates!*

Mar. 2024 **Research Intern**, *CSE, The Hong Kong University of Science and Technology (HKUST).*
Advisor: Prof. Dan Xu | **Research Topic:** Multi-modal Learning and Multi-task Scene Understanding.

Jan. 2024 **Invited as a Reviewer for ICML 2024, ECCV 2024, ICLR 2024, and ICPR 2024.**

Sep. 2022 – **Visiting Student**, *CAIRI AI Lab, School of Engineering, Westlake University.*
Present **Advisor: Chair Prof. Stan Z. Li** (IEEE Fellow, IAPR Fellow) | **Research Topic:** (as follows)
(i) Mixup augmentation and label-efficient learning. | **SemiReward** (**ICLR 2024**); **SAMix**; **OpenMixup** (**555 GitHub stars**).
(ii) Efficient deep network architecture design. | **MogaNet** (**ICLR 2024, 115 GitHub stars**); **LongVQ** (**to IJCAI 2024**).
(iii) Efficient learning framework. | **OpenSTL** (**NeurIPS 2023, 530 GitHub stars**); **Masked Modeling Survey** (**to TPAMI**).
(iv) Vector-Quantized learning and its application for unified foundation models. | **VQDNA** (**to ICML 2024**).

Jul. 2022 – **Summer Research Studentship** (**2** out of **100+ applicants**), *School of Engineering, Westlake University.*
Sep. 2022 **Advisor: Chair Prof. Stan Z. Li** (IEEE Fellow, IAPR Fellow) | **Research Topic:** Visual Representation Learning.

Sep. 2021 – **Research Intern**, *HUST Vision Lab, School of EIC, Huazhong University of Science and Technology.*
Jun. 2022 **Advisor: Prof. Xinggang Wang** | **Research Topic:** Efficient Visual Recognition & Few-shot Semantic Segmentation.

Jul. 2021 – **Visiting Student**, *SIAT-MMLab, Shenzhen Institute of Advanced Tech., Chinese Academy of Sciences.*
Sep. 2021 **Advisor:** Dr. Bin Fu | **Research Topic:** Semantic Segmentation and Text Spotting.

Sep. 2020 – **Research Intern**, *Key Lab of Digital Earth Science, Chinese Academy of Sciences.*
Apr. 2021 **Advisor:** Dr. Xiaoping Du | **Research Topic:** High Resolution Remote Sensing Building Semantic Segmentation.

▬▬▬ Languages and Skills

Chinese (native), English (fluent). **IELTS 7.5 (2023)** overall grades, **CET-4 646** overall grades.
Python DL Libraries, PyTorch, Git, Anaconda, Linux (basic), $\LaTeX$,All-round Research Skills.

Publications (*: Equivalent Contribution. †: Corresponding Author. **Links** are provided)

ICLR 2024 — **MogaNet: Multi-order Gated Aggregation Network**.

Siyuan Li*, **Zedong Wang***, Zicheng Liu, Cheng Tan, Haitao Lin, Di Wu, Zhiyuan Chen, Jiangbin Zheng, Stan Z. Li[†]

● **The first** network backbone design through the lens of multi-order game-theoretic interaction, which portrays inter-variable interaction effects w.r.t. varying scale of context via game theory.

● The representative interactions are emphasized by the proposed spatial gated aggregation and channel reallocation architecture, leading to better representation learning capacity.

● Impressive scalability and superior performance with a more efficient use of model parameters than state-of-the-art ViTs and ConvNets scaling from 5M to 180M on various vision benchmarks.

● **Spontaneously forwarded by world-wide media (Twitter, Zhihu, Wechat) with high appraisal.**

● **Two Weak Accept in CVPR'23, One Strong Accept in ICCV'23, all positive ratings 6668 in ICLR'24**

ICLR 2024 — **SemiReward: A General Reward Model for Semi-supervised Learning**.

Siyuan Li*, Weiyang Jin*, **Zedong Wang**, Fang Wu, Zicheng Liu, Cheng Tan, Stan Z. Li[†]

● **The first** online-optimizable reward model that predicts reward scores to filter out high-quality pseudo labels for semi-supervised representation learning (both classification and regression).

● State-of-the-art across **12 classification and regression** semi-supervised learning benchmarks.

To ICML 2024 — **OpenMixup: Open Mixup Toolbox for Visual Representation Learning**.

Siyuan Li*, **Zedong Wang***, Zicheng Liu*, Di Wu, Stan Z. Li[†]

● **The first** comprehensive mixup visual classification benchmark. where 16 representative mixup algorithms are impartially evaluated from scratch across 12 visual classification datasets, ranging from classical iconic scenarios to fine-grained, long-tail, and scenic cases.

● **The first** standardized mixup-based vision model design and training codebase framework OpenMixup for customized visual classification.

● **Interesting observations** are derived through extensive empirical analysis on various scenarios.

● **Spontaneously retweeted by Prof. Sebastian Raschka (Twitter) with high appraisal.**

● **Spontaneously reported by Lightning AI official account (Twitter) as 'weakly highlights in AI'. (**the same session as pytorch's departure of facebook**)**

To ECCV 2024 — **Boosting Discriminative Visual Representation Learning with Scenario-Agnostic Mixup**.

Siyuan Li*, Zicheng Liu*, **Zedong Wang***, Di Wu, Zihan Liu, Stan Z. Li[†]

● A unified online-optimizable mixup framework that **first addresses the two remaining critical issues** at once: **(i)** Drastic performance variation over different scenarios caused by trivial solutions; **(ii)** Self-supervised learning (SSL) dilemma for online-optimizable mixup policies.

● To reduce the computational cost from online training, a pre-trained version is presented.

● Exceptional performance and generalizability across **12 SL and SSL** image benchmarks.

NeurIPS 2023 — **OpenSTL: A Comprehensive Benchmark of Spatio-Temporal Predictive Learning**.

Cheng Tan, Siyuan Li, Zhangyang Gao, Wenfei Guan, **Zedong Wang**, Zicheng Liu, Lirong Wu, Stan Z. Li[†]

● **The first** comprehensive benchmarking study for spatio-temporal predictive learning that categorized prevalent approaches into recurrent-based and recurrent-free models.

● **The first** modular and extensible framework implementing various state-of the art methods. Impartial evaluations and analysis are conducted across various domains, including synthetic moving object trajectory, human motion, driving scenes, traffic flow, weather forecasting.

● Surprisingly, we find that recurrent-free models achieve a good balance between efficiency and performance than recurrent models.

● **All positive ratings in NeurIPS 2023 (6,6,7,7) | Accepted as Poster by NeurIPS 2023**

To ICML 202 — **Unleashing the Power of Vector Quantization for Multi-Species Genomic Sequence Modeling**.

Siyuan Li*, **Zedong Wang***, Zicheng Liu, Stan Z. Li[†]