Haiyang Xu

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EDUCATION

University of Science and Technology of China (USTC) Hefei, China
School of Gifted Young (Honor School) September 2020 — Present

- B.S., Big Data and Data Science
- *Overall GPA:* 3.90/4.30 (90.44/100). *Ranking:* 2/46.

PUBLICATIONS (* Equal Contribution)

1. **Haiyang Xu*,** Yu Lei*, Zeyuan Chen, Xiang Zhang, Yue Zhao, Yilin Wang, Zhuowen Tu. *Bayesian Diffusion Models for 3D Shape Reconstruction.* [**submitted to CVPR24**].
2. Yilin Wang*, **Haiyang Xu*,** Xiang Zhang, Zeyuan Chen, Zhizhou Sha, Zirui Wang, Zhuowen Tu. *Omni-ControlNet: Dual-stage Integration for Conditional Image Generation.* [**submitted to CVPR2024**].
3. **Haiyang Xu**, Zhichao Zhou, Dongliang He, Fu Li, Jingdong Wang. *Vision Transformer with Attention Map Hallucination and FFN Compaction*. [**Arxiv**]
4. Shuo Wang, **Haiyang Xu***, Jinda Lu*, Yanbin Hao, Xiangnan He. *Feature Mixture on Pre–Trained Model for Few–Shot Learning*. [**submitted to TIP**].

RESEARCH EXPERIENCE

Research Intern, **MLPC@UCSD** San Diego, United States
Bayesian Diffusion Models for 3D Shape Reconstruction April 2023 — Present
Advisor: **Zhuowen Tu**, Professor

- Proposed a new diffusion-based method which use Bayesian Prior to guide reconstruction diffusion models.
- Greatly improves visual quality, further improves Chamfer Distance and F-Score by 5%-10% on synthetic and real-world 3D datasets like ShapeNet and OmniObject3D.
- **Writing a paper as co-first author.**

Research Intern, **MLPC@UCSD** San Diego, United States
Omni-ControlNet: Dual-stage Integration for Conditional Image Generation April 2023 — Present
Advisor: **Zhuowen Tu**, Professor

- Proposed a unified architecture to generate high-quality images under different conditions – depth, hed, scribble, skeleton.
- Remains high-quality and reaches better FID when compared to Uni-ControlNet, with depth 23/27, hed 27/28 and scribble 26/30 under training on 50K high quality images of LAION.
- **Writing a paper as co-first author.**

Research Intern, **MARS@THU** Beijing, China
Self-supervised Learning in Autonomous Driving Jan 2023 — May 2023
Advisor: **Hang Zhao**, Professor

- Conducted experiments of appling SSL methods (MAE / MixMIM) to enhance the Bird-Eye-View (BEV) representations.
- Applied self-supervised methods on camera-only circumstances with the assistance of 3d information. Based on BEVDet, mAP +1.7 with comparable training cost as supervised methods.

Research Intern, **VIS@Baidu, Inc** Beijing, China
Vision Transformer with Attention Map Hallucination and FFN Compaction June 2022 — November 2022
Advisor: **Dongliang He**, Research Scientist

- Proposed hallucinated-MHSA (Multi–Head Self–Attention) and compacted-FFN (Feed–Forward Network) to resolve the inefficiencies of MHSA and FFN modules in ViT.
- Further decreases 10%-20% complexity in parameters and FLOPs when applied on current efficient ViT-based backbones.
- **Wrote a paper as first author**.

Research Intern, **LDS@USTC** Hefei, China

Feature Mixture on Pre–Trained Model for Few–Shot Learning December 2021 — September 2022

Advisor: **Xiangnan He**, Professor

- Proposed a new constrained feature mixture mechanism on pretrained manifolds to utilize base category context information of few-shot learning.
- Surpasses SOTA by 3.8% and 4.2% in 1-shot and 5-shot cases on mini-ImageNet.
- **Wrote a paper as second author.**

PROJECT EXPERIENCE

Research Assistant, **PKU** Beijing, China

Application of Compositional Pattern-producing Network in Solid-Liquid Coupling December 2022 — May 2023

Advisor: Ke Liu, Professor

- Simulate the coupling phenomenon and action between solid and liquid.
- Utilizing Compositional Pattern-producing Network to better formulate the interaction on the cross-material surface.

Research Intern, **USTC&Foxit, Inc.** Hefei, China

Visual-Enhanced Reading Experience based on Multimodal Learning November 2021 — May 2022

Advisor: Tong Xu, Professor

- Collected and cleaned specifc data under requirements of Foxit, Inc.
- Modified the code of CLIP4Clip and trained the model.
- Constructed a UI and a Plug-in for Foxit Reader of commercial use.

AWARDS AND HONORS

- Outstanding Student Scholarship (**Top 5%**) 2023
- Outstanding Student Scholarship (**Top 5%**) 2022
- School of Gifted Young Novelty Scholarship (**6 out of totally 900+ SGY students of Grade 2, 3, 4**) 2022
- Second prize in the Chinese Mathematics Competition 2022
- Outstanding Student Scholarship (**Top 5%**) 2021
- Qiangwei Great Ambition Scholarship (**12 out of totally 1800+ students**) 2021

SKILLS

- *Computer Skills:* Python (PyTorch), C, C++, Java, Software Development (Linux, Windows), LaTeX, Markdown
- *English Fluency:* TOEFL: 109 (S24). GRE: 329+4.

TEACHING

Teaching Assistant, CS1001A *Computer Programming A* 2022