Xiaojun Shan

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Education

University of California, San Diego   *Sep. 2024 – Jun. 2029*
Ph.D. in Machine Learning & Data Science

University of Electronic Science and Technology of China   *Sep. 2020 – Jun. 2024*
B.Eng. in Software Engineering (Elite program)   GPA:3.89/4.00

Publications

1. Qiang Gao*(Advisor), **Xiaojun Shan***, Yucheng Zhang, Fan Zhou.
   Enhancing Knowledge Transfer for Task Incremental Learning with Data-free Subnetwork
   Advances in Neural Information Processing Systems (NeurIPS), 2023.

2. Xiaoyu Zhou, Zhiwei Lin, **Xiaojun Shan**, Yongtao Wang, Deqing Sun, Ming-Hsuan Yang.
   DrivingGaussian: Composite Gaussian Splatting for Surrounding Dynamic Autonomous Driving Scenes
   IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2024.

3. Xiaoyu Zhou, Zhiwei Lin, **Xiaojun Shan**, Yongtao Wang, Deqing Sun, Ming-Hsuan Yang.
   SAMPLING: Scene-adaptive Hierarchical Multiplane Images Representation for Novel View Synthesis from a Single Image
   IEEE/CVF International Conference on Computer Vision (ICCV), 2023.

4. Xin Lin, Shi Luo, **Xiaojun Shan**, Xiaoyu Zhou, Chao Ren, Lu Qi, Ming-Hsuan Yang, Nuno Vasconcelos
   HQGS: High-Quality Novel View Synthesis with Gaussian Splatting in Degraded Scenes
   The Thirteenth International Conference on Learning Representations (ICLR), 2025.

5. Yijiang Li, Jiacheng Cheng, Yi Li, Genpei Zhang, **Xiaojun Shan**, Dashan Gao, Jiancheng Lyu, Yuan Li, Ning Bi, Nuno Vasconcelos
   EgoPrivacy: What Your First-Person Camera Says About You?
   The Forty-second International Conference on Machine Learning (ICML), 2025.

6. Guancheng Wan, Zewen Liu, **Xiaojun Shan**, Max SY Lau, B. Aditya Prakash, Wei Jin
   EARTH: Epidemiology-Aware Neural ODE with Continuous Disease Transmission Graph
   The Forty-second International Conference on Machine Learning (ICML), 2025.

7. Jun Xia, Shaorong Chen, Jingbo Zhou, **Xiaojun Shan**, Wenjie Du, Zhangyang Gao, Cheng Tan, Bozhen Hu, Jiangbin Zheng, Stan Z. Li
   Towards Robust *De Novo* Peptide Sequencing in Proteomics against Data Biases
   Advances in Neural Information Processing Systems (NeurIPS), 2024.

8. **Xiaojun Shan**, Jiacheng Cheng, Yi Li, Yijiang Li, Yunsheng Li, Nuno Vasconcelos
   Toward Reference-free Fine-grained Hallucination Rejection for Large Vision Language Models
   In Submission

9. Yuelei Li, Hyunjin Kim, Fangneng Zhan, Ri-Zhao Qiu, Mazeyu Ji, **Xiaojun Shan**, Xueyan Zou, Paul Liang, Hanspeter Pfister, Xiaolong Wang
   Visual Acoustic Fields
   In Submission

Project Experience

University of California, San Diego   *Sep. 2024 – now*
Ph.D. Student   Advisor: Prof. Zhuowen Tu & Prof.Zhijian Liu

- To eliminate the vector quantization which introduces information loss and training difficulty in 3D autoregressive models, we propose to use the diffusion process to model the per-token probability distribution in 3D generation. We also explore the capability of this process for multi-modal conditional inputs. Besides, we are also working on improving efficiency by deep compress encoder and next-scale prediction. **I am responsible for the idea, the coding, and the writing.**
- We collect the data samples that are hard to learn and easy to cause hallucinations with the help of GPT4-V. With the dataset, we can train a vision language model with preference that achieve better performance against

hallucination. We also aim to build a large benchmark that can measure hallucinations for VLMs. The paper is under review in **ICCV 2025. I am responsible for the idea and code part and am the first author.**

Massachusetts Institute of Technology   *Aug. 2024 – Mar. 2025*

Research Intern   Advisor: Prof. Paul Pu Liang

- To build an efficient multi-modal foundation model that handles complex real-world interactions, we trained separate expert models for each type of multimodal interaction, such as redundancy present in both modalities, uniqueness in one modality, or synergy that emerges when both modalities are fused. We can then use a router to identify an interaction type in real-world applications dynamically. We plan to contribute it to **NeurIPS 2025**. **I participate in the idea proposal as well as coding and will be the first author.**

Wesklake University   *Feb. 2024 – Jul. 2024*

Research Intern   Advisor: Prof. Stan Z.Li

- I participated in a series of works, that utilize Vision Language Models to handle Computational Biochemistry problems. I wrote code for Vision Language Models.
- To efficiently distill the knowledge of the pre-trained teacher model without access to the training data, we introduce a graph-free knowledge distillation that automatically generates training pseudo samples. We then propose to leverage fewer node numbers and the Binary Concrete distribution to model the graph structure to minimize the performance drop and time-consuming problem of using generated pseudo samples.

Peking University & Google   *Sep. 2022 – Jul. 2024*

Research Intern   Prof. Deqing Sun & Prof. Ming-Hsuan Yang

- To represent unbounded outdoor scenes with intricate geometry and multi-scale details, we incorporate a hierarchical refinement branch, resulting in high-quality synthesized novel views with spatial consistency. We adopt an adaptive strategy to make our model learn a more effective and efficient representation of each unbounded outdoor scene without redundancy. The paper is **accepted by ICCV 2023**. **I proposed the adaptive depth module and participated in coding and experiment design.**
- To enable View synthesis and controllable simulation for driving scenes, which have outward views and high-speed dynamic objects, we propose to utilize Composite Gaussian Splatting to decompose the scene and model the complex driving scene hierarchically using sequential data from multiple sensors. The paper is paper **accepted by CVPR 2024**. **I proposed incremental reconstruction for static background and participated in most of coding and experiment design.**

University of Electronic Science and Technology of China   *Jul. 2022 – May. 2023*

Undergraduate Researcher   Advisor: Prof. Qiang Gao & Prof. Fan Zhou

- To efficiently overcome Catastrophic Forgetting and facilitate Knowledge Transfer, we adopt the Lottery Ticket Hypothesis to build a mask for each task. The model transfers knowledge to the new coming task from the learned tasks by selecting the affiliated weights of a set of neurons to be activated, including the reused neurons from prior tasks via neuron-wise masks. It also transfers possibly valuable knowledge to the earlier tasks via data-free replay, which is the first method to achieve positive knowledge transfer without a memory buffer. The paper is **accepted by NeurIPS 2023. I proposed the idea and implemented coding on my own. I also wrote the first draft. I share the co-first author with my mentor.**

PROFESSIONAL SERVICE

Journal Reviewer

- ACM Transactions on Information Systems(TOIS)

Conference Reviewer

- CVPR 2024, ICML 2024, ECCV 2024, NeurIPS 2024, ICLR 2025, CVPR 2025, ICML 2025, ICCV 2025