Haiyang Xu

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Education

University of California, San Diego Ph.D. student in Cognitive Science   **Sep. 2024 − Present**
- Advisor: Prof. Zhuowen Tu
- Research Interests: Controllable Generation

University of Science and Technology of China B.S. in Data Science   **Sep. 2020 − Jun. 2024**

Publications (* Equal Contribution † Project Leader)

- **SemLayer: Semantic Generative Segmentation and Layer Reconstruction for Abstract Icons**
  Haiyang Xu, Ronghuan Wu, Li-Yi Wei, Nanxuan Zhao, Chenxi Liu, Cuong Nguyen, Zhuowen Tu, Zhaowen Wang
  CVPR, 2026

- **VideoNSA: Native Sparse Attention Scales Video Understanding**
  Enxin Song, Wenhao Chai, Shusheng Yang, Ethan Armand, Xiaojun Shan, **Haiyang Xu**, Jianwen Xie, Zhuowen Tu
  ICLR, 2026

- **CVP: Central-Peripheral Vision-Inspired Multimodal Model for Spatial Reasoning**
  Zeyuan Chen, Xiang Zhang, **Haiyang Xu**, Jianwen Xie, Zhuowen Tu
  WACV, 2026

- **OverLayBench: A Benchmark for Layout-to-Image Generation with Dense Overlaps**
  Bingnan Li*, Chen-Yu Wang*, **Haiyang Xu*†**, Xiang Zhang, Ethan Armand, Divyansh Srivastava, Xiaojun Shan, Zeyuan Chen, Jianwen Xie, Zhuowen Tu
  NeurIPS D&B Track, 2025

- **DepR: Depth Guided Single-view Scene Reconstruction with Instance-level Diffusion**
  Qingcheng Zhao*, Xiang Zhang*, **Haiyang Xu**, Zeyuan Chen, Jianwen Xie, Yuan Gao, Zhuowen Tu
  ICCV, 2025

- **YOLO-Count: Differentiable Object Counting for Text-to-Image Generation**
  Guanning Zeng, Xiang Zhang, Zirui Wang, **Haiyang Xu**, Zeyuan Chen, Bingnan Li, Zhuowen Tu
  ICCV, 2025

- **Science-T2I: Addressing Scientific Illusions in Image Synthesis**
  Jialuo Li, Wenhao Chai, Xingyu Fu, **Haiyang Xu**, Saining Xie
  CVPR, 2025

- **Bayesian Diffusion Models for 3D Shape Reconstruction**
  Haiyang Xu*, Yu Lei*, Zeyuan Chen, Xiang Zhang, Yue Zhao, Yilin Wang, Zhuowen Tu
  CVPR, 2024

- **Omni-ControlNet: Dual-stage Integration for Conditional Image Generation**
  Yilin Wang*, **Haiyang Xu***, Xiang Zhang, Zeyuan Chen, Zhizhou Sha, Zirui Wang, Zhuowen Tu
  CVPRW, 2024

Experience

UC San Diego   **Mar. 2025 - Present**

- Advisor: Prof. Zhuowen Tu
- Proposed OverLayBench to systematically evaluate layout-to-image generation with dense overlaps, addressing biases in existing benchmarks. Proposed CreatiLayout-AM, a model trained with curated amodal masks, to improve performance under complex overlaps. Paper accepted to **NeurIPS D&B Track, 2025**.
- Proposed Bayesian Diffusion Model (BDM) for 3D shape reconstruction, which performs effective Bayesian inference by tightly coupling the top-down (prior) information with the bottom-up procedure via joint diffusion processes. Paper accepted to **CVPR, 2024**.
- Proposed OmniControlNet, a dual-stage integration framework for conditional image generation, which could effectively generate different controls and corresponding images in a unified framework. Paper accepted to **CVPRW, 2024**.

Adobe Research   **Jun. 2025 - Nov. 2025**

- Advisor: Dr. Zhaowen Wang
- Introduced part-level SVG semantic segmentation and completion, a system-level challenge beyond any single off-the-shelf model. Proposed **SemLayer**, an end-to-end pipeline that decomposes the task into controllable generation and structured reasoning, enabling solutions where current foundation models fail. Accepted to **CVPR 2026**.

NYU Courant   **May 2024 - Jan. 2025**

- Advisor: Prof. Saining Xie
- Worked on the physical modeling capabilities of generative models. Accepted to **CVPR, 2025**.
- Led a project on agent-based scientific concept videos generation, which creates illustrative videos that convey more direct and understandable content compared to purely text-based explanations, meanwhile benchmarking the layout planning and generation of scientific concept diagrams. In submission.

Skills

Programming and Tools: Python (PyTorch), C/C++, LaTeX
Languages: Mandarin (Native), English (Fluent)