Jia, Bochun

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Education

Institut Polytechnique de Paris — France
M.S. in DataAI — Data and Artificial Intelligence — Sep 2025 – Jul 2027
Northeastern University — China
B.S. in Information Management and Information System — Sep 2018 – Jul 2022

Research Interests: Diffusion Models, Large Language Models, Controllable Generation, Multimodal Vision–Language Modeling.

Research Projects

Controllable Diffusion via Latent-Space Semantic Manipulation — Nov 2025 – Present
Objective: Controllable Image Editing Using a Multi-Step Diffusion Framework with Semantic and Spatial Constraints

- Formulated image editing as a **feature-conditioned latent mixing and generative modeling task**, leveraging **CLIP/CLIPSeg** for semantically guided object extraction and insertion, enabling context-aware image composition.
- Proposed a **dual-stage scaling strategy** that integrates pixel-space normalization with latent-space resizing to preserve both structural integrity and semantic consistency during object composition.
- Implemented **DiT-based diffusion refinement with Flow Matching**, employing ODE-based sampling for precise noise control, thereby improving global visual coherence and reducing **seam artifacts**.

Ongoing Research. Investigating **text-driven controllable generation in latent space**, focusing on the emergence of semantic control along diffusion trajectories and on designing evaluation protocols for generation fidelity and edit consistency.

Cycle-Consistency Reward for Neural Style Transfer — Fall 2025
Objective: Achieving automatic content–style trade-off without human intervention or manual hyperparameter tuning

- Proposed a **Cycle-Consistency Reward** that serves as both a **training-time loss** and an **inference-time Best-of-N selector**, enabling self-adaptive optimization in neural style transfer.
- Validated the framework on **AdaIN** and **SDS-based Style Matching Score (SMS)** architectures, demonstrating stable performance and automatic content–style balancing.
- Integrated **CycleReward** with **Score Distillation Sampling (SDS)** to distill diffusion-quality style representations into a real-time feed-forward generator, enabling efficient real-time image style transfer.

Work Experience

Citigroup Services and Technology — Shanghai, China
Data Engineer / Software Engineer — Jul 2022 – Jul 2025

- Designed and implemented **data governance and lineage systems**, and developed a **Spark SQL-based incremental lineage parsing engine**, modeling **field-level dependencies** as structured graphs for efficient querying and visualization.
- Built a **declarative, configuration-driven data processing and distribution framework** using **YAML-based templates**, enabling flexible data generation, delivery, and rapid system iteration.
- Optimized large-scale data pipelines through **pagination and compression strategies**, achieving up to **60% data compression**, and developed a **unified metadata catalog** integrating **Oracle and Hive** sources.

Technical Skills

Core Tools: Python, PyTorch, CUDA (fundamentals), Git, Docker
Research Topics: Diffusion Models, Transformers, Multimodal Learning, Vision–Language Models (VLMs)