Liqi Jing

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Targeting AI Research Internships (GenAI, Autonomous Driving, CV, NLP)

Education

Duke University — Durham, US
M.S. in Electrical and Computer Engineering — *Aug. 2025 – Present*

- **GPA:** 4.0/4.0
- **Relevant Coursework:** Mathematics for ML, Practical ML, Programming for ML.

Xidian University — Xi'an, China
B.Eng. in Communications Engineering — *Sept. 2020 – July 2024*

- **GPA:** 3.7/4.0
- **Relevant Coursework:** Linear Algebra, Functions of Complex Variables, Probability Theory.

Technical Skills

Generative AI & CV: Autoregressive Transformers, LLMs, Diffusion Models, Flow Matching.
Algorithms & Math: Supervised Fine-tuning, Reinforcement Learning (RL).
Tools & Frameworks: Python, PyTorch, Scikit-learn.

Research & Project Experience

Bosch (China) Investment Ltd. — Shanghai, China
Research Intern – Vision Language Models and Autonomous Driving — *Mar. 2025 – July 2025*

- Researched algorithms for **Vision-Language Models (VLMs)** focusing on data generation, supervised fine-tuning (SFT), and reinforcement learning recipes.
- Designed a **distillation-based pipeline** for generating fine-grained Image-Caption and VQA training data, utilizing a novel crop & zoom-in strategy to enhance visual grounding details.
- Developed a novel **Reinforcement Learning (RL)** mechanism (customized rule-based reward + **GRPO**) for VLM training; incorporated bounding box supervision into **Chain-of-Thought (CoT)** to enhance grounding capability.
- Contributed to the setup of closed-loop simulation environments (Carla, NeuroNCAP) and datasets (NAVSIM) for autonomous driving model evaluation (e.g., Orion).

Duke University — Durham, US
Research Engineer – StyleVAR: Controllable Image Style Transfer Code — *Aug. 2025 – Present*

- Developed **StyleVAR**, a novel generative framework reformulating style transfer as conditional discrete sequence modeling within a multi-scale latent space, utilizing a **600M-parameter Autoregressive Transformer**.
- Proposed a **Blended Cross-Attention** mechanism assigning Style/Content features as Queries and Target history as Keys/Values, preserving autoregressive continuity while allowing dynamic modulation of style intensity.
- Formulated a **Group Relative Policy Optimization (GRPO)** strategy for unsupervised fine-tuning; designed a reward-driven policy using dense perceptual metrics (VGG/CLIP) to optimize visual quality without a Critic network.
- Fine-tuned on OmniStyle-150K with a multi-scale next-token prediction objective, achieving better performance vs. AdaIN (Structure Preservation SSIM **+71%**, Perceptual Distance LPIPS **-18%**).

Duke University – CPSL Lab — Durham, US
Graduate Researcher – Prior-Aligned Flow Matching for Planning — *Current*

- Proposed a novel generative planning framework that unifies **Conditional VAEs (CVAE)** with **Flow Matching theory** to accelerate the sampling in standard diffusion policies.
- Designed a **Scene-Conditional Dynamic Prior** network using Transformers to fuse historical predicted trajectories and local map context, generating continuous, semantically consistent trajectory anchors.
- Formulated a **Prior-Aligned Flow** objective based on **Optimal Transport**, constructing a linearized Probability Flow ODE that transports samples from the dynamic prior directly to the ground truth manifold.
- Theoretically proved that the **CVAE initialization** minimizes the **Wasserstein-2 distance** to the target distribution, significantly compressing Global Truncation Error (GTE) compared to Gaussian noise initialization.
- Implemented a multi-stage curriculum training pipeline: Prior Pre-training → Flow Matching → Joint Fine-tuning to ensure stability and convergence.

Publications

Jing, L. "Research on Video-based Dynamic Mesh Compression Technology and Proposed Improvements." *ICMEEA 2024*. (Jul. 2024)

Xiao, X.; **Jing, L.**; Yan, J. "A Transfer Learning Framework Based CSI Localization Using MTF Image Construction and KL Divergence Method." *SSIP 2024*. (Dec. 2024)