Zeqian **Long**

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Research Statement

My research focuses on **generative AI**. I work on controllable visual synthesis, adversarial robustness, and structured representation learning for modeling world dynamics in precise, trustworthy, and grounded ways.

Education

May 2026 | **University of Illinois Urbana–Champaign** | **IL, United States**
Aug 2022 | *B.S. in Mathematics and Computer Science (Dean's List)* | GPA: 4.0 / 4.0

Coursework (* = graduate-level): Deep Generative Models*, Text Analysis with LLMs*, Graph Learning & Knowledge Mining*, Statistical Machine Learning*, Advanced Algorithms*, Theoretical Mathematics (Stochastic Process, Real Analysis, Abstract Algebra)

Publications

C=Conference, S=In Submission (* = Equal Contribution)

[C.1] **Follow-Your-Shape / EditAnyShape: Shape-Aware Image Editing via Trajectory-Guided Region Control**
Zeqian Long*, Mingzhe Zheng*, Kunyu Feng*, Xinhua Zhang, Hongyu Liu, Harry Yang, Linfeng Zhang, Qifeng Chen, Yue Ma
The Fourteenth International Conference on Learning Representations ***(ICLR 2026)*** [**arXiv** | **OpenReview**]

Research Experiences

Shape-Aware Image Editing via Trajectory-Guided Region Control Mar'25 – Sep'25
EPIC Lab*, *Shanghai Jiao Tong University, *supervised by Yue Ma, Prof. Linfeng Zhang*

- Developed a training- and mask-free image editing framework built on FLUX.1-dev that dynamically localizes editable areas and enables precise and large-scale shape transformations.
- Demonstrated state-of-the-art performance on PIE-Bench and our constructed 290-case ReShapeBench, outperforming FLUX.1 Kontext by over 10% across key quality and fidelity metrics.
- **Github:** https://github.com/mayuelala/FollowYourShape; **Status:** First author, paper accepted at ICLR 2026.

Attention–Driven Adversarial Attack for Image-To-Video Models Jul'25 – Present
UIUC, *collaborated with Haotian Xue, Ozgur Kara*

- Proposed a memory-efficient adversarial attack framework for the Image-to-Video model Wan2.1-14B, inducing significant drops in semantic consistency and degradation in temporal coherence and visual fidelity.
- Designed a cross-attention–driven semantic loss that contrasts source–target CLIP and latent attention to extract semantic deviation signals; integrated multi-resolution VAE encoder feature loss that amplifies reconstruction errors across scales; applied PGD to optimize adversarial perturbations on input images.
- **Github:** https://github.com/Zeqian-Long/Wan-I2V-Attack; **Status:** Planned submission to **ECCV 2026**.

Ontology Grounded Scientific Graph Construction for LLM Retrieval and Reasoning Aug'25 – Dec'25
ULab*, *UIUC, *supervised by Prof. Jiaxuan You, Prof. Jiawei Han*

- Developed a hierarchical scientific ontology that organizes research papers into interpretable semantic dimensions (task, method, dataset, architecture, evaluation, contribution).
- Constructed a fine-grained concept space by designing a corpus-driven induction pipeline that extracts, normalizes, and clusters meaningful semantic fragments, enabling accurate and interpretable paper-to-concept mapping.
- Leveraged the ontology to derive paper relations that reveal deeper connections beyond citations, directly improving LLM fine-grained retrieval, multi-hop scientific QA, and cross-paper comparison analysis.

Neuro-Symbolic Knowledge Graph for Aligning LLM Worldviews Aug'25 – Dec'25
UIUC, *supervised by Prof. Jiawei Han*

- Constructed a neuro-symbolic framework that constructs a Global Values Knowledge Graph by integrating quantitative survey data (WVS, EVS), legal texts, and cultural corpora from 50+ countries to support verifiable cross-cultural and cross-lingual alignment of LLM worldviews.
- Developed a KG-grounded RAG reasoning pipeline that leverages the Knowledge Graph to improve factual grounding, cross-cultural consistency, and temporal awareness in LLM reasoning over value-sensitive queries.

Projects

Predicting Crop Yield based on Sentinel-2 Satellite Data Mar'24 – Jun'24

Independent Project

- Preprocessed Sentinel-2 satellite imagery by aligning it with European crop type maps, sampling consistent spatial blocks, and normalizing spectral features across growth periods.
- Applied modern dimensionality reduction to convert preprocessed images into histograms; trained a CNN and employed Deep Gaussian Process to extract key spectral–temporal patterns for preliminary crop yield estimation across 500 regional samples.

SmartRide – Smart Cycling App for Smarter Riders Jan'25 – May'25

***UIUC**, course project, full-stack development*

- Designed a smart cycling platform integrating route planning, real-time tracking, and personalized user profiling.
- Implemented a route planning module with dynamic map generation, distance optimization, and turn-by-turn navigation; built a route persistence system enabling save, edit, and reload of user-defined paths.
- **Github: https://github.com/CS222-UIUC/team-07-project-smartride**

Working Experiences

Dec 2024 – Aug 2024 | **UIUC Teaching Assistanship | CS 446: Machine Learning** | **IL, United States**

Course Assistant — Professor: Liangyan Gui

- Assist students with machine learning concepts; proofread and grade the homework and exams; manage office hours; support course operations to enhance learning outcomes.

Aug 2024 – Jun 2024 | **Beijing Academy of Artificial Intelligence | Vision and Multimodal Research Center** | **Beijing, CN**

Research Intern — Advisor: Xinlong Wang

- Reproduced 10+ diffusion and autoregressive image generation papers, examining architectural design choices and organizing experimental workflows.
- Contributed to multimodal visual generation research within the **Emu** framework by evaluating baseline models, assessing cross-modal generation quality, and maintaining experiment documentation.

Skills

Programming	Python (PyTorch, TensorFlow), C/C++, Java, Javascript, Bash
AI/ML Frameworks	PyTorch Lightning, HuggingFace Transformers, Diffusers, OpenCV, scikit-learn
Systems/Tools	Linux, Git, Docker, CUDA Toolkit