Ninad Daithankar

Urbana, IL | +1 217-979-5591 | ninadd2@illinois.edu | ninaddaithankar | ninaddaithankar

Education

University of Illinois Urbana-Champaign — Urbana, IL
Master of Computer Science – GPA: 3.91/4 — *Aug 2024 – Dec 2025*
Coursework: Deep Learning for Vision, Computational Photography, NLP, Deep Generative Models

Savitribai Phule Pune University — Pune, India
Bachelor of Engineering - Computer Science – GPA: 9.1/10 — *Aug 2017 – May 2021*
Coursework: Algorithms, Data Structures, Object Oriented Programming, Web Design, Machine Learning

Publications

- [Manuscript in preparation] Alexi Gladstone*, **Ninad Daithankar***, Heng Ji. "What are the optimal assumptions for training a visual encoder?" **ICLR 2026**. *Equal contribution.

Experience

Research Assistant – Blender Lab — Aug 2024 – Present
Siebel School of Computing and Data Science - UIUC — *Urbana, IL*
- Investigating ViT-based motion encoders that compress video by modeling temporal frame differences, advised by **Prof. Heng Ji**
- Exploring a new SSL paradigm that couples a ViT frame and difference encoder to learn high-quality representations from videos
- Stabilized motion encoders with EMA teachers and cross-frame attention, reducing feature drift on long sequences
- Built an HDF5 pipeline to store 40M+ frame features for SSV2/Ego4D enabling 4x faster training throughput on HPC clusters
- Studied existing literature on optical flow, motion vectors and SSL-based representation learning techniques like MAE, DinoV2, BYOL, iBOT, I-JEPA and V-JEPA

Software Engineer – Data Virtualization — Aug 2021 – July 2024
eQ Technologic Inc. — *Pune, India*
- Researched, designed, and implemented a new connector for Deltek OpenPlan (for data integration at a Fortune 100 aerospace customer) as a Java + Python system, leveraging its OLE APIs using pywin32 and pywinauto
- Designed and implemented 'XSD metadata parsing' and 'embedded objects support' for generalizing Java and REST API based Costpoint connector from initial 10 modules to over 100+ modules in Deltek Costpoint
- Designed and implemented 'returning attributes' feature for the generic JDBC connector to reduce latency of consecutive 'write + read' operations by 50pct for databases like Oracle, Teradata and MySQL
- Implemented functionality for Java based Bitbucket connector to support Bitbucket Datacenter REST APIs

Technical Skills

Deep Learning: PyTorch, PyTorch Lightning, Hugging Face, TensorFlow, JupyterLab/Colab, Wandb.ai, Scikit Learn, NumPy, Matplotlib
Languages: Python, Java, Javascript, C/C++, SQL, HTML, CSS, Go
Frameworks: React, Node.js, Django, JDBC, JUnit
Developer Tools: Git, Docker, Slurm, VS Code, PyCharm, IntelliJ, Subversion, Bitbucket, Jenkins, Linux
Databases: Oracle, MySQL, Teradata, MongoDB, SQLite, Neo4j
HPC Platforms: UIUC Research Computing (NCSA Delta, NCSA Delta AI)

Relevant Projects

Immunization against Diffusion-Based Image Editing | PyTorch, PyTorch Lightning, Wandb.ai
- Implemented immunization approaches from the papers *Distraction is All You Need: Memory-Efficient Image Immunization against Diffusion-Based Image Editing* and *Optimization-Free Image Immunization Against Diffusion-Based Editing*
- Implemented stable diffusion pipeline, timestep universal gradient and immunizer networks for adding subtle perturbations

Video-sync by visual indexing using CLIP embeddings | PyTorch, NumPy, Django
- Used OpenAI's CLIP embeddings to develop a visual indexing system to match frames from a target video to multiple source videos and make a new video from it
- Created a synced video of the same environment on UIUC campus but in different seasons (sunny, rain, snow)

Object insertion using Gradient-Domain Fusion | NumPy, OpenCV, Scikit Learn
- Implemented object insertion where an object is extracted from one image and placed in another
- Used Poisson Blending to enforce smoothness and seamlessly blend the object from source image into target image

Improving System-2 Thinking in Energy Based Transformers | PyTorch, PyTorch Lightning, Wandb.ai
- Investigated MCMC-step ramp-up strategies in Energy-Based Transformers, designing linear / exponential schedulers that stabilize long "System-2" reasoning chains without harming validation perplexity

Energy-Based Dense Re-Ranking | PyTorch, PyTorch Lightning, Wandb.ai
- Experimented with a 2-layer MLP energy head that boosts BERT-DPR MRR@10 from 0.340 → 0.371 with minimal extra latency