

# Ajinkya Deshpande

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## SELECTED EXPERIENCE

**Luma AI** | *Research Scientist / Engineer* Redwood City, CA | Jan '26–Present

- Ran **large-scale multimodal midtraining** for Luma's robotics foundation model; led **sidecar ablations**, integrated selected objectives into the main run, and co-designed the data and task mixture.
- **Led fine-tuning experiments to expand controllability beyond text prompting** for Luma's robotics foundation model, owning dataset creation, training, and evaluation end to end.
- Led **post-training and training-free model extensions** for Ray3.2, enabling **10-second video generation and multi-keyframe conditioning**.
- Developed **multishot and temporally fine-grained caption conditioning** for Ray.

**Genesis Therapeutics** | *ML Research Intern* Burlingame, CA | May '25–Jul '25

- Developed **training-free conditioning for diffusion transformers** using molecular features for drug discovery.
- Implemented **inference-time guidance and sequential Monte Carlo** for controllable molecular generation.

**Microsoft Research** | *Research Fellow* Bangalore, India | Sep '22–Jul '24

- Built a **self-correcting LLM code-generation agent** with tool use and active RAG, automating **500+ repository migrations** and improving pass@1 by **20%** on RepoClassBench. **[DMLR at ICML 2024]**
- Created **RepoClassBench**, a benchmark for class-level code generation across Java, Python and C#, with real repository dependencies and test-based verification.
- Developed **FiGURe**, a filter-based unsupervised GNN with **4.4% node-classification accuracy gains** over baselines. **[NeurIPS 2023; MLG at KDD 2024]**
- Curated data and **fine-tuned Mistral-7B** for accuracy, bias and fairness while limiting catastrophic forgetting; placed **2nd in the NeurIPS 2023 LLM Efficiency Challenge**.

## EDUCATION

**Carnegie Mellon University** Pittsburgh, PA  
*Master of Science in Machine Learning* | GPA 4.07/4.0 Dec '25

**BITS Pilani** Goa, India  
*Bachelor of Engineering in Computer Science; Minor in Physics* Aug '21

## ADDITIONAL RESEARCH & PROJECTS

**CMU Ma Lab** | *Research Assistant* Pittsburgh, PA | Sep '24–Dec '25

- Built **MIMYR**: diffusion for tissue structure and transformers for gene expression. **[bioRxiv 2025]**
- Built **LLOKI**: GNN + optimal transport alignment across disjoint gene panels. **[RECOMB 2025; Genome Research]**

**Terra Quantum AG / MIPT** | *Research Consultant* Remote | Mar '21–Jun '21

- Designed a **GNN method to detect quantum advantage and accelerate QAOA**; granted a patent. **[Symmetry 2022]**

## SELECTED PUBLICATIONS

- MIMYR: Generative modeling of missing tissue in spatial transcriptomics  
**bioRxiv 2025** | **First author**
- FiGURe: Simple and Efficient Unsupervised Node Representations with Filter Augmentations  
**NeurIPS 2023; Machine Learning on Graphs Workshop at KDD 2024** | **Co-first author**
- LLOKI: Cross-platform Spatial Transcriptomics Integration using Optimal Transport  
**RECOMB 2025; Genome Research (accepted Sep 2025)** | **Second author**
- Natural Language to Class-level Code Generation by Iterative Tool-augmented Reasoning over Repository  
**Data-centric Machine Learning Research Workshop at ICML 2024** | **Co-first author**

## SKILLS

**Research:** Midtraining, post-training, robot learning, conditional generation, diffusion, LLM agents.

**Tools:** Python, PyTorch, PyTorch Geometric, Hugging Face, NumPy, SciPy, scikit-learn, Java, JavaScript.