

UTKARSH NATH

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EDUCATION

Arizona State University	<i>May 2026</i>
Doctor of Philosophy, Computer Science.	GPA: 4.0
New York University	<i>May 2021</i>
Master of Science, Computer Science	GPA: 3.96
Delhi Technological University	<i>May 2018</i>
Bachelor of Technology, Information Technology.	CGPA: 7.89

INDUSTRY RESEARCH EXPERIENCE

LinkedIn	Mountain View
<i>PhD GenAI Research Intern</i>	<i>May 2025 - Aug 2025</i>
• Proposed Agentic Memory RAG (AMRAG) : a domain-aware RAG framework combining semantic and relational memory within a schema-bounded planning paradigm for global query resolution.	
• Designed a dual-memory indexing strategy using embedding-based semantic memory and relational storage, eliminating expensive LLM calls at ingestion time.	
• Developed a retrieval-time compiler that transforms each query into a deterministic DAG with three bounded operations: Semantic Search, Relational Query, and LLM Synthesis.	
• Outperformed state-of-the-art RAG pipelines on LinkedIn Recruiter data, achieving 33% higher accuracy, 2.6× faster indexing, and up to 150× lower cost.	

ACADAMIC RESEARCH EXPERIENCE

Advancing 3D Asset Generation with Multi-Object Decomposition	Oct 2024 - Sept 2025
<i>In Submission ICLR 2026</i> [project]	
• Pioneered a theoretical framework for compositional 3D generation, identifying and empirically validating that conflicting gradients in prior optimization heuristics lead to predictable failures.	
• Designed a novel staged optimization curriculum that resolves these gradient conflicts by decoupling the learning of scene structure from object-level refinement.	
• Achieved state-of-the-art results in complex 3D asset generation, demonstrating a 73% user preference on multi-object prompts and doubling text-alignment scores over prior methods.	
Deep Geometric Moments Promote Shape Consistency in Text-to-3D Generation.	Jan 2024 - Aug 2024
<i>WACV 2025</i> [paper] [project]	
• MT3D: A 3D Gaussian-based 2D lifting technique that leverages a high-fidelity 3D object to explicitly infuse geometric knowledge into text-to-3D image generation.	
• Utilizes ControlNet and Geometric moment analysis to optimize and refine the shape and structure of 3D objects, effectively alleviating the Janus problem.	
• Surpassing other state-of-the-art text-to-3D generators, MT3D significantly reduces geometric inconsistencies, delivering superior shape, high-fidelity, and enhanced photorealism.	
Polynomial Implicit Neural Framework for Promoting Shape Awareness in Generative Models	
<i>International Journal of Computer Vision</i> [paper]	<i>Aug 2023 - Aug 2024</i>
• Poly-INR: The first INR-based model designed to represent complex shapes within large, diverse datasets such as ImageNet.	
• Employs a geometric moment-based module to generate high-fidelity images without using convolution, upsample, or self-attention layers.	
• Achieved performance on par with state-of-the-art GAN models on the ImageNet dataset, with $3 - 4 \times$ fewer parameters.	
Learning Low-Rank features for Thorax Disease Classification	June 2023 - May 2024
<i>NeurIPS 2024</i> [paper]	<i>Collaboration with Mayo Clinic</i>
• Proposed low-rank feature learning (LRFL) to enhance generalization in pre-trained models.	
• Achieved SOTA results on three medical benchmarks: NIH-ChestX-ray14, CheXpert, and CovidX.	
• Improved AUC by 1-2% over counterparts under a low-data regime with the low-rank model.	
RNAS-CL: Robust Neural Architecture Search by Cross-Layer Knowledge Distillation	Mar 2022 - Dec 2022
<i>International Journal of Computer Vision</i> [paper]	
• RNAS-CL: The first NAS method that optimizes adversarial robustness and prediction accuracy without robust training	
• Extends standard Knowledge Distillation by learning student-teacher cross connections	
• Achieves SOTA results in terms of clean accuracy, robust accuracy and model size on CIFAR-10 and ImageNet dataset	

- Proposed Adjoined Network (AN), a One-shot learning paradigm to compress and regularize any CNN-based architecture
- Enhanced AN: Differential Adjoined Network, a NAS technique applied over AN to obtain the optimal compressed architecture
- Achieves accuracy comparable to current SOTA structured pruning methods but with $2\times$ fewer parameters

WORK EXPERIENCE

Samsung Research <i>Software Engineer</i>	New Delhi <i>July 2018 - July 2019</i>
• Led a team of three to build a mobile application to interact and control internal functioning of Samsung Smart TV through wireless(wifi-direct) and wired connection	
• Features of application involved controlling factory settings, fetching serial logs, running internal tests and fixing them	

Coding Blocks <i>Algorithm Instructor</i>	New Delhi <i>Aug 2017 - July 2019</i>
• Conducted Launchpad course for C++: Data Structures, Algorithms, Object Oriented Programming	

Google Summer of Code, FOSSASIA <i>Student Developer</i>	New Delhi <i>May 2017 - Aug 2017</i>
• Worked on Open-Event project, which aims to develop automated tool for creation of app and website for conferences. Part of the team responsible for frontend development and designing of the tool	

PUBLICATIONS AND PATENT

- **Utkarsh Nath**, Rajeev Goel, Eun Som Jeon, Changhoon Kim, Kyle Min, Yezhou Yang , Yingzhen Yang and Pavan Turaga. Deep Geometric Moments Promote Shape Consistency in Text-to-3D Generation. WACV 2025.
- **Utkarsh Nath**, Rajhans Singh, Ankita Singh, Kuldeep Kulkarni and Pavan Turaga. Polynomial Implicit Neural Framework for Promoting Shape Awareness in Generative Models. *International Journal of Computer Vision (IJCV)*
- Yancheng Wang*, Rajeev Goel *, **Utkarsh Nath**, AC Silva, Teresa Wu and Yingzhen Yang. [Learning Low-Rank Feature for Thorax Disease Classification NeurIPS 2024](#)
- Jinyung Hong, Eun Som Jeon, Changhoon Kim, Keun Hee Park, **Utkarsh Nath**, Yezhou Yang, Pavan K. Turaga and Theodore P. Pavlic. [Debiasing Global Workspace: A Cognitive Neural Framework for Learning Debiased and Interpretable Representations NeurIPS 2024 Workshop on Behavioral Machine Learning 2024](#)
- **Utkarsh Nath**, Yancheng Wang, Pavan Turaga and Yingzhen Yang. [RNAs-CL: Robust Neural Architecture Search by Cross-Layer Knowledge Distillation International Journal of Computer Vision \(IJCV\), June 2024](#)
- **Utkarsh Nath**, Yancheng Wang and Yingzhen Yang. [Neural Architecture Search Finds Robust Models by Knowledge Distillation Uncertainty in Artificial Intelligence \(UAI\) 2024](#)
- **Utkarsh Nath**, Yancheng Wang and Yingzhen Yang. [RNAs-CL: Robust Neural Architecture Search by Cross-Layer Knowledge Distillation. ICLR 2023 Workshop on Pitfalls of limited data and computation for Trustworthy ML. 2023.](#)
- **Utkarsh Nath**, Shrinu Kushagra and Yingzhen Yang. [Adjoined Networks: A Training Paradigm with Applications to Network Compression. AAAI Spring Symposium 2022](#)
- Deep Geometric Moment for 3D Generative AI. *U.S. Provisional Pat. Ser. No. 63/860,593, filed August 2025*
- Method and system for guided breathing from audio data. *U.S. Provisional Pat. Ser. No. 63/087,930, filed October 2020*

SKILLS

Languages: C/C++, Java, Python, Javascript, HTML/CSS, Swift

Libraries: Pytorch, Numpy, Pandas, Scikit Learn, OpenCV, Matplotlib

Other Tools: MySQL, Android, Xcode, Linux, Git

SERVICES

- Reviewer NeurIPS 2024, NeurIPS 2025, WACV 2025, ICLR 2025, ICML 2025, IEEE Transactions on Information Forensics and Security, IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- Teaching Assistant for Data Structures and Algorithm (CSE 310) ASU, Foundation of Machine Learning (CSE 475) ASU, Statistical Machine Learning (CSE 575) ASU and Introduction to programming (CS 1114) NYU.
- Google facilitator for Applied CS with Android for DTU, 2017