

Nihal Jain

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EDUCATION

Carnegie Mellon University – School of Computer Science

Pittsburgh, PA

Master of Science in Machine Learning | GPA: 4.06/4.0

Dec 2022

Birla Institute of Technology & Science (BITS), Pilani

Hyderabad, India

Bachelor of Engineering in Computer Science | GPA: 9.94/10.0

Jul 2021

WORK EXPERIENCE

Amazon Web Services (AWS), AI Labs

New York, NY

Applied Scientist Intern

May 2022 – Aug 2022

- Implemented a setup for the distributed pretraining of large language models with **350M+** parameters on large datasets (BigQuery) with **4M+** examples using PyTorch Lightning, HuggingFace Transformers and DeepSpeed
- Improved GPT-based decoder models (CodeGen) for code understanding and generation via contrastive learning

Adobe Research

Bangalore, India (Remote)

Research Intern

Jan 2021 – Jul 2021

- Designed a data-driven algorithm to perform multi-view similarity search given a collection of images
- Implemented a self-supervised deep learning pipeline trained on **~300K** images using PyTorch to obtain disentangled multi-view representations of images
- Formalized composition of multiple collections of images to enable a novel querying technique for similarity search

Research Intern

May 2020 – Jul 2020

- Developed GANs to generate color profiles conditioned on textual queries collected from Google's Bigrams Corpus
- Improved image search performance by utilizing generated color profiles conditioned on textual queries
- Conceptualized an end-to-end deep learning pipeline for color-based image editing guided by textual input only

Indian Institute of Remote Sensing – Indian Space Research Organisation (ISRO)

Dehradun, India

Research Intern

May 2019 – Jul 2019

- Automated land cover classification of satellite imagery of Indian terrain sourced from ESA's Sentinel-1 satellite
- Implemented six CNN models for semantic segmentation of temporal satellite imagery using Keras
- Evaluated generalization using the Jaccard score for large unseen images of North India spanning **2500 sq. km.**

SELECTED PUBLICATIONS

- [Nihal Jain](#), Praneetha Vaddamanu, Paridhi Maheshwari, Vishwa Vinay, Kuldeep Kulkarni. Inspiration Retrieval for Visual Exploration. In Machine Learning for Creativity and Design (NeurIPS 2021 Workshop). 2021. [[Link](#)]
- Paridhi Maheshwari, [Nihal Jain](#), Praneetha Vaddamanu, Dhananjay Raut, Shrayish Vaishay, and Vishwa Vinay. Generating Compositional Color Representations from Text. In Proceedings of the 30th ACM International Conference on Information and Knowledge Management (CIKM). 2021. [[Link](#)]

PATENTS

- "Color Representations for Textual Phrases", U.S. Patent Application No. 17/111,819. Patented 2022/6/9. [[Link](#)]
- "Text Editing of Digital Images", U.S. Patent Application No. 17/079,844. Patented 2022/4/28. [[Link](#)]

PROJECTS

MultiViz: Visualizing and Understanding Multimodal Models [[Link](#)]

CMU | Jan 2022 – May 2022

- Developed an interpretability framework for analyzing multimodal models by measuring unimodal importances, cross-modal interactions and prediction errors using methods like LIME and gradient analysis
- Designed a user-study to evaluate the effectiveness of insights provided from the framework on multimodal datasets

Semi-supervised 3D Human Pose Estimation [[Link](#)]

CMU | Jan 2022 – May 2022

- Proposed a simple 3D human pose estimation framework that only relies on multi-view 2D supervision
- Achieved **11.6%** improvement over state-of-the-art methods using test-time adaptation on the HumanEva benchmark

SKILLS

Programming Languages:

Python, C, C++, JavaScript, Java, Shell

Development Tools & Frameworks:

PyTorch, Spark, PyTorch Lightning, Flask, Vue.js, React.js, Git

AWARDS & HONORS

Institute Gold Medal – BITS, Pilani

Aug 2021

- Awarded a Gold Medal for having obtained first position among the class of ~1100 graduating students

KC Mahindra Scholarship for Post Graduate Studies Abroad – KC Mahindra Education Trust

Jul 2021

- Awarded scholarship to pursue post-graduate studies abroad offered to ~50 out of > 1000 applicants