

ANANNYA POPAT

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EDUCATION

University of Toronto

Master's, Applied Computing, AI Concentration

Sep 2023 - Jan 2025

GPA: 3.94

Vellore Institute of Technology

Bachelor's, Computer Science and Engineering

Jul 2019 - Jul 2023

GPA: 9.17

PROFESSIONAL EXPERIENCE

University Health Network (UHN)

Machine Learning Specialist

Toronto, ON, Canada

Feb 2025 - Present

- Engineered an interactive 3D anatomical model from patient-specific CT scans using TotalSegmentator and VTK to enhance surgical planning.
- Integrated a generative model (GramGAN) into the backend pipeline via Docker containers to apply realistic medical textures onto anatomical structures.
- Contributing to the development of a Tool-Tissue Interaction (TTI) detection model using YOLOv5 and training a Vision Transformer (ViT) model for precise tool and interaction classification to advance surgical practice in real-time.

University Health Network (UHN)

AI Research Intern

Toronto, ON, Canada

May 2024 - Dec 2024

- Led the development of an interactive 3D anatomical model from patient-specific CT scans to enhance surgical planning.
- Leveraged nnU-Net based TotalSegmentator for precise tissue segmentation and implemented interactive 3D modeling using Visualization Toolkit (VTK).
- Performed a comparative study on texture extraction and mapping for medical images using Wavelet Transform, Gabor Filters, fine-tuned Neural 3D Style Transfer, and fine-tuned GramGAN, where deep learning techniques performed 61.4% better than traditional methods.

AdGlobal360

Data Science Intern

Gurugram, HR, India

May 2022 - Jul 2022

- Developed a lead scoring prediction model to identify potential buyers based on website activity with 95% F1 score.
- Worked with big data and performed exploratory data analysis using SQL, Spark and Python frameworks for accessing client data entries for ML modeling.

PROJECTS & OUTSIDE EXPERIENCE

Optimized LLM Modeling: Classification and Instruction Fine-Tuning - [Link to project](#)

Personal LLM Project

Toronto, ON, Canada

Feb 2025 - Present

- Integrated attention mechanisms like causal, multi-query, and grouped multi-query attention with KV cache optimization.
- Experimented with positional embedding strategies in Transformers such as sinusoidal, learned, and relative position embeddings.
- Implemented classification and instruction fine-tuning of Ollama using different prompt styles and data processing techniques.
- Deployed on AWS using Docker containers and an MLOps pipeline for automated training, validation, and deployment.

Text-based 3D Gaussian Splatting Object Segmentation - [Link to project](#)

Master's Academic Project, University of Toronto

Toronto, ON, Canada

Mar 2024 - Apr 2024

- Developed a 3D Gaussian Splatting segmentation model using LangSAM for text-driven 3D segmentation.
- Devised an optimized prompt initialization strategy employing K-means clustering for optimal view selection and point sampling.
- Improved IoU by 3%, accuracy by 1%, and reduced computational load by 50% while maintaining near-optimal results.
- Improved results for the paper "SAGD: Boundary-Enhanced Segment Anything in 3D Gaussian via Gaussian Decomposition".

Ink-To-Tint: Manga Artisan - [Link to project](#)

Master's Academic Project, University of Toronto

Toronto, ON, Canada

Nov 2023 - Dec 2023

- Automated manga colorization and style conversion to enhance readability and ease artists' workload.
- Optimized image processing techniques like dodging and dilation to decolorize colored manga datasets.
- Trained a Pix2Pix conditional GAN to successfully colorize black-and-white manga pages with a 55% decrease in MSE loss.
- Fine-tuned a pre-trained Stable Diffusion model (MeinaMix v10) for manga style transfer across four distinct art styles.

SKILLS

Skills: Python, R, Java, SQL, HTML/CSS, Pytorch, Tensorflow, OpenCV, Scikit-learn, Flask, Blender, Git, Linux/Unix, Docker, AWS, Computer Vision, Machine Learning, Pandas, NumPy, Natural Language Processing (NLP), C/C++, Blender, VTK, NiBabel, Deep Learning, Graphics, Spark

PUBLICATIONS

Movie Poster Genre Classification using Federated Learning, ICMLDE 2022, Elsevier

Published paper (6 citations): doi.org/10.1016/j.procs.2023.01.177

- Designed a decentralized federated architecture for movie genre classification, achieving 81% accuracy with local CNN training, enhanced privacy and reduced storage requirements.

Histology Classification for Early Gastric Cancer using AI Model, SAGES 2025

To be published in SAGES 2025 Journal under UHN

- Fine-tuned ResNet50 model to classify histologic types in early gastric cancer (EGC) from endoscopic images, achieving 91% specificity for undifferentiated types and 87% specificity for differentiated type.