

ANANNYA POPAT

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EDUCATION

University of Toronto *Sept 2023 - Dec 2024*
Masters of Science in Applied Computing, Artificial Intelligence Concentration

Vellore Institute of Technology (VIT), Vellore *Jul 2019 - Jul 2023*
Bachelor of Technology in Computer Science and Engineering and Business Systems **CGPA: 9.17/10.0**

RELEVANT SKILLS

Technical Skills	Computer Vision, Deep Learning, Machine Learning, Computer Graphics, Data Science
Programming Languages	Python, R, Java, JavaScript, SQL, HTML, CSS/Tailwind CSS, C, C++
Frameworks	PyTorch, Tensorflow, OpenCV, Scikit-Learn, Flask, Pandas, NumPy, Matplotlib, NiBabel, VTK, Blender, Git, Linux, PowerBI, AWS

PROFESSIONAL EXPERIENCE

AI Research Intern, UHN, Canada — *Python, Pytorch, C++, OpenCV, Generative AI* *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)** with **Python, C++** and **Blender**.
- Fine-tuned a Neural 3D Mesh Renderer (achieving a 75% loss reduction on the **VGG19 Neural Network** model) and introduced an optimized initialization strategy with smoothing algorithms to eliminate artifacts for improved texture mapping using **PyTorch**.
- Performed a comparative study on texture extraction and mapping using Wavelet Transform, Gabor Filters, **Neural 3D Style Transfer**, and **GramGAN**, demonstrating up to 61.4% performance improvement of **deep learning** methods for realistic 3D texture mapping over traditional **computer vision** techniques using **Python, OpenCV**, and **PyTorch**.

Teaching Assistant, University of Toronto, Canada — *Python, Teaching, Communication* *Sep 2023 - Apr 2024*

- Mentored students in the Introduction to Python course during the Fall 2023 and Winter 2024 semesters.
- **Simplified complex concepts** using relatable analogies and customized problem-solving strategies based on students' unique backgrounds.
- **Tailored teaching approaches to accommodate diverse fields**—such as management, psychology, and computer science—promoting clear understanding across multidisciplinary audiences.

Data Science Intern, AdGlobal360, India — *Tensorflow, Python, Pandas, NumPy, Matplotlib* *May 2022 - Jul 2022*

- Developed a lead scoring **prediction model** leveraging **Random Forests, Logistic Regression**, and **Deep Neural Networks**, achieving a 95% F1 score in identifying potential buyers based on website activity.
- Conducted **exploratory data analysis and visualization** using **SQL, PowerBI, Python, NumPy, Pandas**, and **Matplotlib** to perform feature engineering and visually present key customer conversion factors for stakeholders, followed by **Machine Learning** modeling using **TensorFlow**.

KEY PROJECTS

Text-based 3D Gaussian Splatting Object Segmentation, 3D Sensing, University of Toronto *Apr 2024*
Project Report: <https://bit.ly/3DHMM2H> — *Python, PyTorch, Deep learning, Transformers, Gaussian Splatting*

- Developed a **3D Gaussian Splatting** segmentation model using LangSAM for text-driven 3D segmentation using **Python**.
- Devised an optimized prompt initialization strategy employing **K-means clustering** for optimal view selection and point sampling.
- Utilized **Segment-Anything-Model (SAM)** for mask generation and majority voting for final 3D Gaussian segmentation.
- Enhanced IoU by 3% and accuracy by 1% through k-means multiview point sampling compared to single-view method.
- Reduced computational requirement by retaining near-optimal results while using only 50% input data.

Ink-To-Tint: Manga Artisan, Computational Imaging, University of Toronto *Nov 2023 - Dec 2023*
Project Report: <https://bit.ly/49QWqAI> — *Python, PyTorch, Stable Diffusion, Generative AI, Computer Vision*

- Automated manga colorization and style conversion to enhance readability and ease artists' workload.
- Optimized image processing techniques like **dodging** and **dilation** in **Python** to decolorize colored manga datasets.
- Developed a Pix2Pix **conditional GAN** in **PyTorch**, employing **CNN** for discriminator and a **U-Net** for generator, to successfully colorize black-and-white manga pages with a 55% decrease in MSE loss over 80 epochs.
- Fine-tuned a pre-trained **Stable Diffusion** model (MeinaMix v10) for manga style transfer across four distinct art styles.

Qualitative Badminton Player Analysis, Capstone Project, Vellore Institute of Technology *Jan 2023 - Mar 2023*
Project Report: <https://bit.ly/49Qd2J5> — *Python, Tensorflow, OpenCV, Neural Networks, Computer Vision*

- Developed a **computer vision** system for tracking player movements and classifying badminton strokes in broadcast videos.
- Tracked badminton players using the **Particle Filter** and custom jersey color detection algorithms with **99% accuracy**.
- Predicted badminton strokes of player through **Convolutional Neural Networks** using **OpenCV, Pillow, Python** and **Tensorflow** with **81% accuracy**.
- Detected court boundaries using image binarization, edge detection, **Probablistic Hough Lines** and K-Means clustering.

KEY PUBLICATIONS

Movie Poster Genre Classification using Federated Learning, Elsevier *Sep 2022*
Dr. Boominathan Permul, Department of Computer Science, Vellore Institute of Technology
Published Paper: doi.org/10.1016/j.procs.2023.01.177

- Pioneered an image-based movie genre classification algorithm using **Federated Learning** to prioritize **data privacy** of graphic content in the movie industry.
- Designed a decentralized federated architecture, enabling storage savings and local **CNN** training with **distributed data**.
- Achieved an 81% weighted average validation accuracy with a CNN model using **TensorFlow** and **Pillow**.
- Presented research at the **International Conference on Machine Learning and Data Engineering** to an expert panel.

Histology Classification for Early Gastric Cancer using AI Model, SAGES 2025 *March 2025*
Dr. Hoseok Seo and Dr. Amin Madani, Surgical AI Research Academy, UHN

- Fine-tuned a pre-trained **DenseNet201** model to classify histologic types in early gastric cancer (EGC) from endoscopic images using **PyTorch**, achieving 93.4% training accuracy and 74.0% internal validation accuracy.
- Preprocessed a dataset of 2,944 labeled images from 2,001 patients using **JSON, Python**, and **OpenCV** to train and validate the model on default and ROI-cropped images.
- Abstract accepted for publication in the **Surgical Endoscopy** journal by SAGES and selected for a podium presentation at the **2025 SAGES Annual Meeting**.