

Devnith Wijesinghe

Research Engineer

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Summary

I am interested in building generative models grounded in applied mathematics principles to achieve greater efficiency, controllability, and generalization across language and vision.

Interest areas: Flow Models, Diffusion Language Models, Vision-Language Models

Education

Faculty of Engineering, University of Moratuwa

Aug. 2022 - June 2026

*Bachelor of Science (Hons) in Engineering (specializing in Biomedical Engineering),
Department of Electronic and Telecommunication Engineering*

- CGPA : 3.98/4.0
- Dean's List in all 8 semesters
- Ranked 1st in the field of specialization

Richmond College Galle

Jan. 2012 - Aug. 2020

G.C.E. Advanced Level (Physical Science stream)

Research Experience

Research Engineer

Jul. 2026 - Present

WSO2 (Advised by: Dr. Srinath Perera)

Colombo, LK

- Conducting research on generative AI for enterprise applications.

Visiting Research Student

Dec. 2024 - Jul. 2025

The University of Sydney (Advised by: Prof. Anusha Withana)

Sydney, NSW

- Conducted research on magnetic interaction design for Human Computer Interaction (HCI).
- Investigated machine learning surrogate models for simulating magnetic fields.

Publications

PathKGen: Pathology Knowledge Assisted MLLM for Explainable Histopathology

(Under review for WACV 2027)

Projects

Magnetic Interaction Design Framework

The University of Sydney 2025

- Designed a gradient-based optimization framework to be used as a co-design tool for magnetic interaction design in Human Computer Interaction (HCI) applications.
- Modeled magnetic fields using machine learning surrogate models such as Physics-Informed Neural Networks and used them to develop computationally efficient optimization algorithms.
- Verified the simulations using finite element analysis software COMSOL Multiphysics.

OCT Image Denoising, Super-resolution and Classification 🔗

VIP Cup 2024

- Implemented the denoising of OCT B-scans using SVD and BM3D.
- The resulting OCT scans were then upscaled to a higher resolution using an EDSR-GAN model. A ResNet-18 backbone was used for transfer learning to classify the final images into 3 classes to identify diabetic symptoms.
- Completed as a submission to the Video and Image Processing Cup 2024.

HIV Inhibitor Classification Using Graph Neural Network 🔗

Self-initiated

- Developed a Graph Neural Network using PyTorch Geometric to classify the HIV inhibitory activity of molecules.
- Used MoleculeNet repository to obtain molecule data in the form of SMILES strings and extracted molecular features using the DeepChem library for graph-level classification.
- Addressed class imbalance using oversampling/undersampling techniques and weighted cross-entropy loss.

Fine-tuning Stable Diffusion XL with DreamBooth 🔗

Invited Workshop

- Used DreamBooth with an automated Hugging Face tool called AutoTrain to fine-tune SDXL for users' own images.
- Made as a demonstration at the Introduction to Generative AI workshop hands-on session.

MFCC Speaker Recognition 🔗

Signal Processing Cup 2024

- Created a deep neural network to classify audio recordings of 71 speakers using Mel-Frequency Cepstral Coefficients as a feature extractor. The architecture consisted of a bidirectional LSTM network trained on triplet-cosine loss.
- Designed as a solution for Signal Processing Cup 2024 challenge problem.

Line-follower Robot Computer Vision System 🔗

Sri Lanka Robotics Challenge 2024

- Trained a lightweight deep learning-based computer vision system to identify cubes and cylinders to run on the Raspberry Pi 4 hardware platform.
- Used a MobileNet architecture via TensorFlow Lite for inference at the edge.
- This system was implemented to optimize a time-consuming sub-task at Sri Lanka Robotics Challenge 2024. The deployment of this lightweight inference system on the line-follower robot outperformed every other group within that particular sub-task.

Volunteering

IEEE EMBS Student Chapter, University of Moratuwa

Head of Public Relations
Brainstorm 2024 - Design Lead
Executive Committee - Content Creator
Member

Sep. 2024 - Sep. 2025
Dec. 2023 - Nov. 2024
Jul. 2023 - Jul. 2024
Jan. 2023 - Jun. 2023

Rotaract Club of University of Moratuwa

Co-director of Membership Development
Co-chair of Premio Foramalita and Euphoria Prom
Co-chair of project Manusath Handa
Inducted Member

Jun. 2023 - Jun. 2024
Apr. 2023 - May. 2023
Aug. 2022 - May. 2023
Sep. 2022 - May. 2023

Mathematics Society, University of Moratuwa

Design team

2023

Electronic Club, University of Moratuwa

Graphic designer and editorial pillar member

2023

Honors and Awards

Gold Medalist in Biomedical Engineering, University of Moratuwa	<i>Jul. 2026</i>
Dean's list placement (all 8 semesters), University of Moratuwa	<i>Jul. 2026</i>
Finalist, Sri Lanka Robotics Challenge 2024	<i>Mar. 2024</i>
Spirit of Service Award, Rotaract Mora	<i>May. 2023</i>
Sri Lanka Chemistry Olympiad Honorable Mention	<i>Jan. 2020</i>
Sri Lanka All Island Mathematics Quiz Bronze medal	<i>Jan. 2020</i>
Principal's medal for best Ordinary Level (OL) results, Richmond College	<i>2018</i>

Invited Talks

Finetuning Stable Diffusion XL for your own images	<i>SkillSurf (2024)</i>
Delivered as a part of the free one-day workshop "Introduction to Generative AI" by SkillSurf	
Video Slides	
Introduction to AI in Healthcare	<i>Brainstorm (2026)</i>
Delivered as a part of the Brainstorm 2026 workshop series organized by IEEE EMBS Student Branch Chapter at University of Moratuwa.	
Video	

Technical Skills

Languages: Python, MATLAB, C, C++, Julia, Lua
Markup: HTML, CSS, L^AT_EX, Markdown
Libraries: PyTorch, PyTorch Geometric, JAX, NumPy
Tools/Other: Git, GitHub, Obsidian

References

Prof. Ranga Rodrigo

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Associate Prof. Anusha Withana

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