

Dumindu Bandara

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I am a PhD student specializing in advancing robotic learning in simulation environments with a focus on bridging the gap between simulation and real-world transfer. With a strong foundation in computer vision, natural language processing, and computational protein design, I bring interdisciplinary expertise to my research. Passionate about pushing the boundaries of machine learning, I have actively collaborated on multiple research projects, demonstrating strong analytical and problem-solving skills. Committed to continuous learning and innovation, I aim to contribute to impactful research in robotics and artificial intelligence.

Education

University of Florida, Gainesville, FL, USA

May 2025 - Present

Ph.D in Computer Science

GPA: 4.0/4.0

- Focus:
 - Low-level robotic simulation to high-level robotic simulation learning transfer methods
- Advised by:
 - Prof. Prabhat Mishra, CISE, UF, USA

University of Moratuwa, Moratuwa, Sri Lanka

Jan 2020 - Jun 2024

B.Sc. Engineering (Electronics and Telecommunication)

GPA: 4.07/4.2

- Dean's List (3.8+): Semesters 1, 2, 3, 4, 5, 6, 7, 8
- Highlighted Coursework:
 - Fundamentals of Image Processing and Machine Vision - EN2550 - A
 - Machine Vision - EN4553 - A+
 - Pattern Recognition and Machine Intelligence - EN4573 - A+
 - Advances in Machine Vision - EN4583 - A+
 - Digital IC design - EN4603 - A+

D. S. Senanayake College, Colombo, Sri Lanka

Jan 2005 - Aug 2018

- GCE Advanced Level (Mathematics, Physics, Chemistry) 3A's/ 25th Country/ z-score 2.5753
- Most Outstanding Student of the Physical Science Stream.

Chartered Institute of Management Accountants (CIMA)

Dec 2018 - Dec 2019

- Diploma in Management Accounting.
- Certificate in Management Accounting.

Experience

AI Engineer

May 2024 - May 2025

FCode Labs Pvt. Ltd

Colombo, Sri Lanka

- Worked on protein engineering using machine learning models.
- Responsibilities included evaluating and fine-tuning protein language models (PLMs), and developing metrics to indicate the fitness of models and multi-target optimization of ML models.
- Worked on sampling strategies to maximize explore-exploit tradeoff for novel protein generation.
- Created an API using Fast API to serve PLMs hosted on compute resource-heavy virtual machines.

Visiting Research Student

Jan 2023 – Sep 2023

University of Sydney

Sydney, Australia

- Completed industrial placement under the supervision of Dr. Kanchana Thilakarathna.
- Worked on uses of diffusion models to enhance the privacy of network traffic, audio and images.
- Collaborated on a journal publication *NetDiffus: Network traffic generation by diffusion models through time-series imaging* in Computer Networks journal.

Publications

- J1 Netdiffus: Network traffic generation by diffusion models through time-series imaging. (2024). Sivaroopan, N. , **Bandara, D.** , Madarasingha, C. , Jourjon, G. , Jayasumana, A. , Thilakarathna, K. Computer Networks, Elsevier. [🔗](#)
- C1 End-to-End Wrist PPG Generation Using Radial Artery Hemodynamics and Light Transport Simulation. (2025). Kuruppu, S. , Fernando, B. , Tharindu, D. , **Bandara, D.** , Pasqual, A. 2025 IEEE 25th International Conference on Bioinformatics and Bioengineering (BIBE) [🔗](#)

Technologies

Machine Learning:

- Computer Vision: CNN, ViT, GAN, CLIP and Diffusion models.
- NLP: Transformers, BERT and GPT.
- Protein Engineering: ESM2, AlphaFold3 , UniRep, Ankh.
- Traditional ML: KNN, SVM, Random Forests, Linear Regression, Logistic Regression, Gaussian Processes.

Programming: Python (Pytorch, Numpy, Scipy, Jax, Scikit-learn, OpenCV, Opacus, ML-flow and Gpytorch), C/C++, Bash, MATLAB

Cloud Services: AWS, Azure

Other tools: Xilinx Vivado, Quartus Prime, Modelsim, Cadence Genus and Innovus, Altium and Solidworks

Soft Skills: Leadership, Presentation, Communication, Teaching and Teamwork

Research

NetDiffus: Network Traffic Generation by Diffusion Models Through Time-Series Imaging. [🔗](#) **Jan 2023 - Jan 2024**

- Research collaboration during the internship as a visiting research student at the University of Sydney.
- Focused on generating synthetic network traffic using diffusion models.
- Increased fidelity by 66.4% and accuracy of downstream tasks by 18.1%.
- Downstream tasks include traffic fingerprinting, anomaly detection and traffic classification.

Non-linear Graph Signal Processing for Graph Reconstruction.

Ongoing

- The Research project was initialized under the supervision of Dr. Chamira Edussooriya with an external collaboration with Tu Delft University in the Netherlands.
- Focuses on graph reconstruction using non-linear Volterra filters and Sobolev smoothness to reconstruct graph signals with imputations.
- MATLAB is used to develop graph processing algorithms using the [GSP Toolbox](#).

Projects

Hemodynamic Analysis of Radial Artery Pulse Waveforms. [🔗](#) **June 2023 - April 2024**

- This project focuses on designing a wrist-worn photoplethysmography(PPG) based device to analyse a patient's physiological state.
- The device has a wristband consisting of an analog front end and a desktop device to process and transmit data via Bluetooth to a mobile phone.
- My contributions to this project were designing and assembling the PCB for the desktop device, developing the machine learning model based on the UNet architecture for PPG waveform to blood pressure waveform mapping and systolic and diastolic blood pressure, carrying on interpretability analysis using SHAP values to identify corresponding wave segments for SBP and DBP, deploying the machine learning model using AWS Sagemaker and creating a simple interface to view results using Streamlit.

SIMD Array Processor.

Aug 2023 - Dec 2023

- A pipelined SIMD Array Processor was implemented using DSP slices of a Zynq-7000 SoC.
- The processor supports integer and vector operations (dot product).
- Custom ISA was designed and a C program was written to generate instructions for a matrix multiplication demonstration.

Teaching Experiences

Instructor - University of Moratuwa - EN 1094 Laboratory Practicals

Jan 2024 - May 2024

- Worked as an instructor for electronics, telecommunications, signals and systems laboratories.

Awards

Sri Lanka Telecom Scholarship Award - Highest GPA in Semester 5 from ENTC	2024
Recipient of ScholarX mentorship - SEF - Mentor: Isuru Daulagala(NVidia)	2023
Mahapola Scholarship Award - 25th in Country GCE Advanced Level	2019
Bronze Medal- Sri Lankan Physics Olympiad	2018

Competitions

CSAW Embedded System Challenge - NYU - Runner up in the North American Region	2023
IEEEXtreme 17.0 - Island-wide 39th place out of 17,000 participants	2023
IEEEXtreme 16.0 - Island-wide 8th place out of 14,600 participants	2022
Spark Challenge - Champions	2022
IEEE Signal Processing Cup - Worldwide 21st Place	2022
Robot Design and Competition - Champions	2021
Maestro Business Case Study Challenge - Runners Up	2020
Robo Games - Second Runners Up	2020

Leadership and Volunteer Experience

Department Representative	2023/2024
Co-chairperson - ENTC Career Fair	2023/2024
Sales Manager - AIESEC Colombo South - Incoming Global Talent	2021
Committee Vice President (Finance) for Idealize by Ideamart - AIESEC Colombo South	2021

Professional Associations

Institution of Engineers, Sri Lanka (IESL)	2022 - Present
◦ Student member, Membership number: S-28499	
Institute of Electrical and Electronic Engineers (IEEE)	2022 - Present
◦ Student member, Membership number: 97257090, IEEE-R10	

References

Prof. Prabhat Mishra, Ph.D

IEEE Fellow, AAAS Fellow
ACM Distinguished Scientist
Department of Computer and Information Science
and Engineering, University of Florida, Gainesville,
Florida, USA
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Dr. Ranga Rodrigo

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Canada), Ph.D. (Western, Canada), SMIEEE
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