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

- 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.

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 photoplethosmography(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.

System Bus on FPGA. **Aug 2023 - Dec 2023**

- A custom system bus with two masters, three slaves and a bus bridge with priority arbitration and split transactions.
- My contribution was implementing the bus bridge and a custom UART module to communicate with the external bus using system verilog. Bus bridge operation was tested by connecting two separate bus designs

using Alterra DE115 FPGA boards.

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

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
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Dr. Ranga Rodrigo
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