NILAKSHAN KUNANANTHASEELAN

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https://nilakshankunananthaseelan.github.io/

EDUCATION

Monash University, Australia Jan 2023 - Present

Ph.D. in Computer Vision, focusing on customizing foundational models through multimodal representations.

University of Moratuwa, Sri Lanka Nov 2014 - Dec 2018

Honours B.Sc. in Electronic and Telecommunication Engineering.

PUBLICATIONS

LaViP: Language Grounded Visual Prompting

Nilakshan Kunannathaseelan, Jing Zhang, & Mehrtash Harandi. Proceedings of the AAAI Conference on Artificial Intelligence 2024.

Machine-Based Detection and Classification for Bone Marrow Aspirate Differential Counts: Initial Development Focusing on Nonneoplastic Cells

Chandradevan, R., Aljudi, A. A., Drumheller, B. R., **Kunananthaseelan, N.**, Amgad, M., Gutman, D. A., Cooper, L., & Jaye, D. L. (2020). Laboratory investigation, 100(1), 98–109.

TEACHING EXPERIENCE

Monash University, Clayton Feb 2023 - Present
Teaching Associate

- ECE 4076/ECE 5176: Computer vision - Semester 1, 2023
- ECE 4179/ECE 5179/ECE 6179: Neural networks and deep learning - Semester 2, 2023

Monash University, Clayton Dec 2023
Workshop Organizer

- Contributed as an organizing member for the hybrid workshop, "AI for Everyone", conducted by the Faculty of Engineering across multiple Monash campuses.

WORK EXPERIENCE

Monash University, Clayton Feb 2023 - Present
Teaching Associate

- ECE 4076/ECE 5176: Computer vision - Semester 1, 2023
- ECE 4179/ECE 5179/ECE 6179: Neural networks and deep learning - Semester 2, 2023

Computational and Integrative Pathology Group, Northwestern University Feb 2021 - June 2023
Research Intern

- Prepared and processed breast cancer datasets for survival analysis.
- Created models for multi-task learning and domain-adversarial training in survival analysis.
- Developed a tailored hyperparameter tuning package for survival data analysis, enhancing model accuracy and reliability.
  website: https://www.pathdata.io/

Analog Inference, USA Mar 2019 - Nov 2022
Senior ML Research Engineer

- Developed customized deep learning models for diverse vision tasks, enhancing the accuracy and robustness of the systems under different analog hardware constraints.
- Devised tailored algorithms for model optimization in Computer Vision, focusing on quantization, compression, pruning, and noise compensation.

Omdena AI community Jan 2021 - Nov 2022
Volunteer Lead ML Engineer

- Employed named entity recognition models, such as BERT, DistilBERT, and BiLSTM variants, to accurately identify key phrases in abstracts from a dataset comprising over 7000 medical articles.
- Designed and developed a specialized model for sentiment analysis of finance-related tweets to identify and classify instances of financial crimes.

CooperLab, Emory University Feb 2018 - Oct 2019
Undergraduate Research Intern

- Created and deployed a region-based object detector and classifier specifically designed for counting white blood cells in non-neoplastic samples. Integrated and deployed the developed model seamlessly with **HistomicsTK**.

PROJECTS

Digitization of Tamil documents and literature Oct 2023 - Present
Noolaham Project, Sri Lanka

- Developed an OCR pipeline to extract content from scanned documents.
- Focusing customization of LLMs to establish a reliable and efficient QA pipeline.

Deep Learning Accelerator Mar 2019 - Nov 2022
Analog Inference, USA

- Implemented integer-only models, including ResNet, FCN, SSD, YOLOv5, KeyPoint Extraction, and Person ReID, to overcome inherent constraints and enable their execution on an Analog hardware accelerator.
- Developed advanced algorithms for precise quantization of weights and activations, achieving accuracy levels close to floating-point representation.
- Created a specialized pre-processor tool to analyze and comprehend model behaviour in varying hardware environments, enabling refined optimization.

Developing Text Analytic API (Jan 2021 - Nov 2022)
ExentAI, UK

- Developed language processing models proficient in executing diverse text analytics tasks.
- Deployed machine learning models as API-based services.
- Currently engaged in customizing LLMs to suit domain-specific data requirements.

Early Prediction of Network Anomalies (Apr 2019 - Oct 2019)
Paraqum Technologies, SL

- Developed analytical models utilizing Cluster Analysis, Decision Trees, and RNNs for analysing network traffic data.
- Implemented predictive models to detect bandwidth congestion, anomalies, and potential bottleneck scenarios, enhancing the performance of network monitoring systems.

SKILLS/ INTERESTS

Research	Learning through multimodality, Few-shot and Zero-shot learning Customizing foundational models, Reasoning and Interpretable AI
Programming Languages	Python, C++, MATLAB, R
ML Tools	PyTorch, TensorFlow, Keras, OpenCV, Scikit-learn, HuggingFace, spaCy
Data science	SQL, Spark (Basic Level)
MLOps	MLflow, DAGsHub (Basic Level)
Cloud	AWS, GCP (Basic Level)
Web	Streamlit, Flask, Bootstrap, HTML (Basic Level)
Softwares	InkSpace, LaTeX
Tools	Git, Docker, DVC, Kubernetes (Basic Level)

AWARDS/ACHIEVEMENTS

Secured a DUG HPCaaS grant to conduct research focused on customizing foundational models
Monash University 2023-2024

AWS Machine Learning Scholarship Recipient (Top 300 candidates) Udacity 2020

Dean's List Faculty of Engineering, University of Moratuwa, Sri Lanka - All Semesters 2015 - 2018

Certificate of Appreciation Active volunteer, Expose Exhibition, University of Moratuwa, Sri Lanka 2016

Merit Pass in G.C.E A/L Examination Sri Lanka (Top 1%) 2013

EXTRACURRICULAR ACTIVITIES

E-Club University of Moratuwa
Member

· Member of Organizing Committee, Expose exhibition

Sri Lanka Robotics Competition workshop University of Moratuwa
Voluntary Teaching

· Participated in teaching sessions conducted for school students.