

Pamuditha SOMARATHNE

PhD Researcher | Software & Electronic Engineer

 Google Scholar
 Sydney NSW, Australia

 [linkedin.com/in/psomarathne](https://www.linkedin.com/in/psomarathne)

 github.com/PamudithaSomarathne



SUMMARY

A final-year PhD Candidate specialising in **Human-Computer Interaction (HCI)** and **Machine Learning**, with a focus on predictive modelling of human motion to create more intuitive and inclusive digital experiences. I draw on my background in **Software and Electronic Engineering** to bridge the gap between sensor data and motion modelling.

A core driver of my research is **improving the accessibility** of emerging technologies, ensuring that gesture systems are adaptable and equitable. Beyond my primary research, I collaborate on biomedical signal processing projects for **wearable health monitoring**.

EDUCATION

Jan'24 – Pres. **The University of Sydney**, Australia
Ph.D. Candidate in the School of Computer Science

Nov'18 – Jul'23 **University of Moratuwa**, Sri Lanka
BSc. Engineering (Honours) in Electronic and Telecommunication Engineering
GPA: 4.07/4.20 (First Class Honours)

Jan'09 – Aug'17 **Bandaranayake College**, Gampaha, Sri Lanka
G.C.E. Advanced Level Examination
National Rank: 2nd (out of 27,000) | **District Rank: 1st**

PUBLICATIONS

1. D. Dewagiri, K. Anuradha, P. Liyanage, H. Kulatunga, P. Somarathne, U. S. K. P. Miriya Thanthrige, N. Lucas, A. Withana, and J. P. Kulasingham, *VideoPulse: Neonatal heart rate and peripheral capillary oxygen saturation (SpO2) estimation from contact free video*, arXiv preprint arXiv:2602.23771, [Preprint], 2026.
2. P. Somarathne, S. Herath, G. Gargiulo, P. Breen, N. Anderson, Y. Yao, T. Liu, and A. Withana, "A dual classifier-regressor architecture for heart sound onset/offset detection," *IEEE Transactions on Biomedical Engineering*, pp. 1–9, 2026, [Early Access]. doi: 10.1109/TBME.2026.3654558.
3. Y. Dong, P. Somarathne, C. T. Jin, J. Kim, A. Bianchi, and A. Withana, "Just before touch: Manipulating perceived haptic sensations through proactive vibrotactile cues in virtual reality," in *Proceedings of the Augmented Humans International Conference 2025*, ser. AHs '25, New York, NY, USA: Association for Computing Machinery, 2025, pp. 79–91. doi: 10.1145/3745900.3746097.
4. T. Li, P. Somarathne, Z. Sarsenbayeva, and A. Withana, "NeverLagging: Enhancing virtual reality finger tracking with a physics-inspired time-agnostic graph neural network," in *Proceedings of the 37th Australian Conference on Human-Computer Interaction*, ser. OzCHI '25, New York, NY, USA: Association for Computing Machinery, 2025, pp. 647–657. doi: 10.1145/3764687.3769915.
5. A. Niwarthana, P. Somarathne, P. Qian, K.-T. Yong, and A. Withana, "Efficient and robust heart rate estimation approach for noisy wearable ppg sensors using ideal representation learning," in *Proceedings of the 2024 ACM International Symposium on Wearable Computers*, ser. ISWC '24, Melbourne VIC, Australia: Association for Computing Machinery, 2024, pp. 1–8. doi: 10.1145/3675095.3676606.
6. A. Thieshanthan, A. Niwarthana, P. Somarathne, T. Wickremasinghe, and R. Rodrigo, "HPGNN: Using hierarchical graph neural networks for outdoor point cloud processing," in *2022 26th International Conference on Pattern Recognition (ICPR)*, 2022, pp. 2700–2706. doi: 10.1109/ICPR56361.2022.9956238.



RESEARCH & ENGINEERING PROJECTS

2025 Present	Project Lead Adaptive Communication Interfaces, THE UNIVERSITY OF SYDNEY, IP Development ➤ Leading the development of a real-time gesture recognition system for non-verbal communication. ➤ Includes data collection through Google Cloud (GCP). PyTorch GCP HCI Large-scale Motion Modelling
2024 Present	Generative Motion Modelling, THE UNIVERSITY OF SYDNEY, PhD Research ➤ Developing generative architectures for high-fidelity 3D human motion reconstruction. ➤ Optimising latent space representations for sparse sensor data inputs. PyTorch SMPL Generative AI
2022 2023	Adaptive Compressive Sensing for Differentiable Microscopy, UNIVERSITY OF MORATUWA, Final Year Project ➤ Researched adaptive online compressive sensing algorithms for differentiable microscopy, in collaboration with Dr. Dushan Wadduwage (Harvard University) and Jathushan Rajasegaran (UC Berkeley). Python TensorFlow PyTorch Compressive Sensing
2021 2022	Green-Machine: FPGA Management System, INTEL INNOVATEFPGA, Global Silver Award ➤ Achieved Gold Award (Asia-Pacific) and Global Silver Award at the Intel InnovateFPGA design contest. ➤ Implemented CNN-based image classification on an Intel Cyclone V SoC FPGA for autonomous mini-greenhouse management. FPGA Verilog Cyclone V Embedded Vision
2020 2021	Smart Breadboard: Remote Electronics Laboratory, UNIVERSITY OF MORATUWA, Competition Win ➤ Designed a MOSFET-matrix smart breadboard that physically reconstructs circuits drawn in a remote UI, enabling electronics lab work during the pandemic. ➤ Won first place (Sri Lanka) at the IEEE PES remote-lab design competition and advanced to the Region 10 stage of the IEEE CAS Student Design Competition. Altium C++ Hardware Design



PROFESSIONAL EXPERIENCE

Jan 2024 Present	Graduate Researcher, THE UNIVERSITY OF SYDNEY, Australia ➤ Developing generative and predictive models for 3D human motion reconstruction (SMPL). ➤ Researching human-centric AI to improve the accessibility of emerging technologies. ➤ Analysing bipartite mask graphs and spectral properties of Masked Autoencoders (MAE). ➤ Designing adaptive sensor data frameworks to assist in sparse pose estimation. Python PyTorch SMPL Human-Computer Interaction Generative Modelling
2024	Academic Tutor (Pervasive Computing), THE UNIVERSITY OF SYDNEY, Australia ➤ Conducting tutorials and providing technical guidance for senior undergraduate/postgraduate students. ➤ Mentoring students on the implementation of sensor-based systems and context-aware computing. Pervasive Computing IoT Mentorship
Jul 2023 Dec 2023	Visiting Research Affiliate, THE UNIVERSITY OF SYDNEY, Australia ➤ Engineered physics-enabled neural networks to predict human motion from historical datasets. ➤ Bridged the gap between theoretical motion modelling and practical sensor data application. Physics-Informed ML Human Motion Analysis
Jan 2023 Mar 2023	Visiting Instructor, UNIVERSITY OF MORATUWA, Sri Lanka ➤ Lectured "EN2853 - Embedded Systems and Applications" for undergraduate engineering students. ➤ Designed course materials and tutorials focusing on real-time systems and firmware development. Embedded Systems Pedagogy Electronic Engineering
Feb 2022 Jul 2022	Student Research Affiliate, THE UNIVERSITY OF SYDNEY, Australia ➤ Investigated motion prediction models and analysed accessibility needs for children with Cerebral Palsy. ➤ Contributed to HCI research aimed at adaptive technology for motor-impaired users. Accessibility HCI Cerebral Palsy Research



HONOURS & AWARDS

2022	Global Silver Award , Intel InnovateFPGA Design Contest (Global Grand Final)
2021	World Champions , IEEE Signal Processing Cup (SPCup) Challenge Featured in <i>IEEE Signal Processing Magazine</i> , vol. 39, no. 1, pp. 126–131, Jan. 2022
2020	Global Rank 116 , IEEEExtreme 14.0 24-hour Programming Competition
2018	Master of Bandaranayake , Most Outstanding Student (2017 Batch)
2018	Prof. C.R. Kulathilaka Memorial Award , All-Island Highest Mark in Combined Maths
2017	National Rank: 2nd , G.C.E. Advanced Level Examination (Sri Lanka)
2018 – 2023	Dean's List , Faculty of Engineering, University of Moratuwa (7/8 Semesters)

TECHNICAL SKILLS

Machine Learning	PyTorch, TensorFlow, HuggingFace Accelerate , Computer Vision (MAEs, SMPL)
Signal Processing	Sensor Fusion , Biomedical Signal Analysis, Time-series Analysis, Spectral Analysis
Statistical Analysis	Bayesian Modelling (PyMC), Probabilistic Programming, Data Visualisation
Programming	Python, C/C++
On-device ML	Model Quantisation , Edge AI, Sensor Integration
Developer Tools	Git, $\text{\LaTeX}$

LEADERSHIP & VOLUNTEERING

2022	Award-Winning Member, IEEE STUDENT BRANCH, UoM, Sri Lanka
2021	➤ Contributed to the chapter emerging as "The Best IES Student Branch Chapter in the World." ➤ Organised the Sri Lankan Robotics Challenge (2021), promoting robotics and programming island-wide. Leadership Event Management Robotics
2019	Vice President (Marketing), AIESEC COLOMBO SOUTH, Sri Lanka
2018	➤ Led marketing strategies for project OCEANO, managing a base for 150+ members to organise social and educational events. Strategic Marketing Team Leadership

CERTIFICATIONS

Machine Learning	Deep Learning Specialization (DeepLearning.AI), Mathematics for ML (Imperial College London), ML (Stanford)
Algorithms	Algorithmic Toolbox, Data Structures (UC San Diego)
Hardware	Introduction to FPGA Design for Embedded Systems (University of Colorado Boulder)