

Nipuni Hansika Wijesinghe

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Profile

As a PhD student in Robotics, I am dedicated to advancing the field through innovative research in Human-Robot Interaction (HRI), Machine Learning (ML), and adaptive robotic systems. My work focuses on developing self-modulating robots that can dynamically adjust their presence and interactions in real-world environments, aiming to enhance user experience and engagement. I possess a strong foundation in both theoretical and practical aspects of robotics, complemented by hands-on experience in programming, data analysis, and interdisciplinary collaboration. Passionate about education and mentorship, I aspire to inspire future generations of engineers and researchers in the transformative potential of robotics technology.

Education

Doctor of Philosophy in Human-Robot Interaction

UNIVERSITY OF CANBERRA

March. 2024 – Present

Canberra, Australia

Bachelor of Science (Hons) in Computer Science

UNIVERSITY OF SRI JAYWARDENEPURA

Dec. 2016 – Dec 2020

Colombo, Sri Lanka

• First class division - GPA 3.70

- Major: Computer Science, Minors: Mathematics, Statistics
- Four-year degree program (full time). Undertaken over one semester covering 26.67% of the final year. Research involved detecting driver's drowsiness by constant monitoring of the driver motions via machine learning and image processing techniques. Considering the amount of research work done and the presentation skills it was awarded an "A-" grade (GP 3.7/4/0).

Certificate Program in IT Applications

SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY

Apr. 2016 – July. 2016

Kandy, Sri Lanka

Experience

Collaborative Robotics Lab (CRL) Administrative, Communications and Marketing Coordinator

UNIVERSITY OF CANBERRA

April 2026 – Present

Colombo, Sri Lanka

Coordinate internal and external lab communications, manage CRL's social media channels and website (GitHub Pages), and support outreach efforts by developing engaging content to promote research milestones and partnerships. Additionally provide project coordination support for industry-partnered initiatives and assist with the organisation of UC events, expos, and public engagement activities. Liaise with external collaborators and industry partners to maintain professional relationships and provide regular operational updates to CRL leadership.

Sessional Academic

UNIVERSITY OF CANBERRA

April 2024 – Present

Colombo, Sri Lanka

Subject: Technology Innovation and Entrepreneurship. Conducted tutorial sessions, markings, and contributed to the development of lecture materials.

Subject: Technology Engineering and Management. Conducted tutorial sessions, and markings.

Subject: Introduction to Information Technology. Conducted tutorial sessions, and markings.

Subject: Discrete Mathematics. Conducted tutorial sessions, and markings.

Subject: Visual and Interactive Computing. Conducted workshop/ lab sessions

Senior Business Analyst

April 2023 – Feb 2024

AXIATA DIGITAL LABS (PVT) LTD _____

Colombo, Sri Lanka

Projects: Dialog Axiata Star Points, Visitor Management System, Red Cross Disaster Rescue App. Training BA interns, Research and review current state/ future state/ gap of business systems, gathering requirements, uncovering areas for improvement, and designing solutions, Requirement gathering via requirement workshops with clients, Requirement elicitation, brainstorming, and grooming, Documentation of functional requirement specifications (FRS), user manuals, and requirement related documents, Direct stakeholder management, Being scrum master of the team, Serving as a liaison between stakeholders and users.

Business Analyst

Feb 2021 – April 2023

AXIATA DIGITAL LABS (PVT) LTD _____

Colombo, Sri Lanka

Projects: Ncell Axiata Gifting Platform MVP II / Dialog Axiata Distribution Management System/ Share Credit/ USSD Revamp/ RapideZ Voucher Management System (VoMs)/ Robi Mithra/ Ncell Axiata Social Distribution/ Mithra/ MyADL/ Ncell Payment Gateway, Dialog Axiata Star Points. Evaluating business processes, anticipating requirements, uncovering areas for improvement, and developing and implementing solutions, Requirement gathering via requirement workshops with clients, Requirement elicitation, brainstorming, and grooming, Documentation of functional requirement specifications (FRS), user manuals, and requirement related documents, Direct stakeholder management, Being scrum master of the team, Serving as a liaison between stakeholders and users

Intern - Business Analyst

July 2020 – Jan 2021

AXIATA DIGITAL LABS (PVT) LTD _____

Colombo, Sri Lanka

Project: Ncell Axiata Gifting Platform MVP I & MVP II / Dialog Axiata Distribution Management System / SAQ CRs Phase II / Dialog Axiata Commission Engine. Requirement gathering via requirement workshops with clients, Requirement elicitation, brainstorming, and grooming, Documentation of functional requirement specifications (FRS), user manuals, and requirement related documents, Stakeholder management, Being scrum master of the team.

Trainee - Business Analyst

Dec. 2019 – July. 2020

15NTAP SOLUTIONS _____

Colombo, Sri Lanka

Project: MyPartner.lk website Revamp. Handling requirement gathering, Requirement elicitation, and grooming, Documentation of functional requirement specifications (FRS), and requirement related documents

Publications

Nipuni H Wijesinghe and MDR Perera. An affordable driver fatigue detection system in real time. *Journal of Information and Communication Technology (JICT)*, 1(2), 2023

Nipuni H Wijesinghe, Yue Peng, Sharni Konrad, Maleen Jayasuriya, Janie Busby Grant, and Damith Herath. Reframing social presence for human robot interaction. In *2025 20th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pages 1716–1721. IEEE, 2025

Nipuni H Wijesinghe, Maleen Jayasuriya, Janie Busby Grant, and Damith Herath. Real-time social presence modulation of embodied ai-based robots: An audio-centric approach. In *2025 IEEE 21st International Conference on Automation Science and Engineering*. IEEE, 2025

Nipuni H Wijesinghe, David Hinwood, Maleen Jayasuriya, Janie Busby Grant, and Damith Herath. Adaptive gaze modulation in social robots: A reinforcement learning approach to attention regulation. In *2025 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, 2025

Damith Herath, Amy LaViers, Sitao Zhang, Nipuni Hansika Wijesinghe, Sharni Konrad, Janie Busby Grant, James Z Wang, et al. The body in affective robotics: A survey and conceptual positioning using the performing arts as a scaffold for understanding bodily expressed emotion. *IEEE Transactions on Affective Computing*, 2025

Sharni Konrad, Nipuni Wijesinghe, Eileen Roesler, and Janie Busby Grant. From affinity to adoption: Exploring affinity with technology, social presence, and intended future robot use. In *Companion Proceedings of the 21st ACM/IEEE International Conference on Human-Robot Interaction*, pages 624–628, 2026

Media Appearances

Guest Presenter - Tuesday Knowledge 1st

SRI LANKA RUPAVAHINI (NATIONAL TV), COLOMBO, SRI LANKA
<https://www.youtube.com/watch?v=pJzyLLdspTc&t=5s>

March 2020

Conferences

- An Affordable Driver Fatigue Detection System in Real Time** International Conference on Science and Technology 2023 *Dec. 2023*
- Reframing Social Presence in Human-Robot Interaction** International Conference on Human-Robot Interaction 2025 *March. 2025*
- Real-Time Social Presence Modulation of Embodied AI-based Robots: An Audio-Centric Approach** 2025 IEEE 21st International Conference on Automation Science and Engineering *Aug. 2025*
- Adaptive Gaze Modulation in Social Robots: A Reinforcement Learning Approach to Attention Regulation** 2025 IEEE/RSJ International Conference on Intelligent Robots and Systems *Oct. 2025*

Programming Skills

Programming Languages : ROS, Python, Java, C

Libraries : Tensorflow, Keras, Scikit-learn, Pandas, Numpy, Deepspeech, Streamlit

Web Development : HTML, CSS, JavaScript

Database : MySQL

Projects

Development of a Self-Modulating Model for a Robotic Embodied System *Mar 2024 – Present*

Focused on developing adaptive robotic systems that can perceive context and dynamically adjust their social presence in human-robot interactions. The work investigates multimodal context understanding and behaviour modulation, enabling robots to self-regulate their expressiveness, responsiveness, and engagement in a human-like manner across different situations.

A Driver Drowsiness Detection System *Feb 2020 – Dec 2020*

Developed a driver drowsiness detection system using eye closure and yawning detection. The system identifies facial regions using the Haar cascade classifier, locates the facial landmarks of the eyes and mouth using support vector machines (SVM) and histogram of oriented gradients (HOG) are utilized, eye closure is evaluated by computing the eye aspect ratio (EAR), and yawning is detected by measuring the distance between the driver's upper and lower lips. Based on the empirical findings obtained during field testing, this research has demonstrated a noteworthy accuracy of 96% in effectively detecting driver drowsiness across diverse scenarios.

A Humanoid Robot for Kindergarten Kids – Candy – Phase 01 *Jan 2020 – April 2020*

Candy is a human-faced robot designed to mimic facial expressions, capable of mirroring a person's facial cues. It was developed as an interactive robot for kindergarten children, with a primary focus on helping introverted kids engage more actively.

Voice and Sound Reactive Dress (e-textile) *May 2019 – Dec 2019*

This project involved designing a smart dress that responds dynamically to sound and voice, creating a visually engaging experience for live performances. Using Arduino technology and a sound sensor, the dress detects sound frequencies and triggers embedded LED lights to respond accordingly. For example, during high-frequency and vocal segments, the LEDs illuminate, while during quieter moments, they dim or turn off, creating a synchronized light show throughout a performance. This innovative approach was developed to enhance the visual appeal of live entertainment, offering singers, dancers, announcers, and other performers a unique, interactive element to captivate audiences.

Extra Curricular Activities

CRL Admin University of Canberra, Canberra, Australia	<i>2026-Present</i>
Conducts Robotics Workshops for Primary/ High School Students University of Canberra, Canberra, Australia	<i>2025-Present</i>
Conducts IT Workshops for Primary/ High School Students Axiata Digital Labs, Colombo, Sri Lanka	<i>2023-2024</i>
Member- Computer Science Society University of Sri Jayewardenepura, Colombo, Sri Lanka	<i>2016-2020</i>
Committee Member - Aurora, Computer Science Week University of Sri Jayewardenepura, Colombo, Sri Lanka	<i>2017</i>
Committee Member - Sisi Arundathee - Dancing (Volunteer Work) University of Sri Jayewardenepura, Colombo, Sri Lanka	<i>2017-2020</i>
Senior Prefect - Prefect Guild Pushpadana Girls' College, Kandy, Sri Lanka	<i>2017</i>
Member - Leo's Club Pushpadana Girls' College, Kandy, Sri Lanka	<i>2014-2015</i>
Minister/ Member - Student Parliament Pushpadana Girls' College, Kandy, Sri Lanka	<i>2011-2013</i>