DINITHI PURNA DISSANAYAKE

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I am a researcher in AI and Human-Computer Interaction, passionate about building human-centered AI systems that improve decision-making, interaction, and accessibility. My research focuses on applying machine learning and multimodal analytics to develop explainable, user-aware technologies.

ACADEMIC QUALIFICATIONS

PhD in Computing *started Aug 2023*
School of Computing, National University of Singapore, Singapore
Supervised by Prof. Suranga Nanayakkara

B.Sc. Engineering (specialized in Electronic and Telecommunication Eng.) *Aug 2017 - July 2022*
University of Moratuwa, Sri Lanka
First Class Honors | GPA: 3.92 out of 4.2 | Dean's List (7 out of 8 semesters)

EXPERIENCE

Research Intern *Aug 2024 – Feb 2025*
Meta Reality Labs × Augmented Human Lab, NUS, Singapore
Designed and executed a large-scale VR gameplay study (N=150) using multimodal data (eye, head, and physiological signals) to model motion sickness onset. Developed ML models to predict real-time discomfort scores for games on the Meta Horizon Worlds platform. Built robust pipelines for synchronizing high-frequency HMU and eye-tracking data.

Data Analytics Consultant *Jan 2023 – Aug 2023*
LIRNEasia, Colombo, Sri Lanka
Developed ML models and pipelines to classify built-up regions in satellite imagery, enabling a data-driven urbanization index for Sri Lanka. Integrated workflows with QGIS and Google Earth Engine for automated spatial analysis and visualization. Designed longitudinal datasets to study household energy consumption patterns.

Data Engineer *May 2022 – Aug 2023*
Axiata Digital Labs Pvt. Ltd., Colombo, Sri Lanka
Engineered ML/DL deployment pipelines for the company's AI Factory platform, which develops a common environment for ML/DL model development, testing, and integration into real-world business processes[AWS]. Built scalable data ingestion and model integration workflows for multiple business domains. Developed a customer churn prediction ML model and pipelines[GCP], introducing data-driven analytics to a major telecom client.

SELECTED PUBLICATIONS

VRSense: An Explainable System to Help Mitigate Cybersickness in VR Games
CHI EA '25
***Dinithi Dissanayake**, Chitralekha Gupta, Prasanth Sasikumar, Suranga Nanayakkara*

Navigating the State of Cognitive Flow: Context-Aware AI Interventions for Effective Reasoning Support
Human-AI Interaction for Augmented Reasoning - CHI '25 Workshop
***Dinithi Dissanayake**, Suranga Nanayakkara*

CrossPoint: Self-Supervised Cross-Modal Contrastive Learning for 3D PointCloud Understanding
CVPR 2022
*Aflal Afham, Isuru Dissanayake, **Dinithi Dissanayake**, Amaya Dharmasiri, Kanchana Thilakarathna and Ranga Rodrigo*

3DLatNav: Navigating Generative Latent Spaces for Semantic-Aware 3D Object Manipulation
Learning to Generate 3D Objects and Scenes - ECCV 2022 Workshop
*Amaya Dharmasiri, **Dinithi Dissanayake**, Isuru Dissanayake, Aflal Afham, Ranga Rodrigo and Kanchana Thilakarathna*

Sensory Spotlight: Dynamic Multimodal Fusion for Anticipating Human Attention
Under Review at AAAI 2026
***Dinithi Dissanayake**, Malsha de Zoysa, Sachini Shermila, Chitralekha Gupta, Suranga Nanayakkara*

Sensing and Responding to Internal User States: A Systematic Literature Review of User-Aware Adaptive Assistive Wearables
Under Review at CHI 2026
***Dinithi Dissanayake**, Hyong Woon Lee, Moritz Messerschmidt, Yize Wei, Suranga Nanayakkara*

Bridging the Gulf of Endorsement: Enabling Automatic Endorsement of Cognitive Augmentation Systems
Under Review at CHI 2026
*Hyong Woon Lee, **Dinithi Dissanayake**, Dixon Rajendran, Punyawee Anunpattana, Suranga Nanayakkara*

SELECTED RESEARCH PROJECTS

Context-Awareness for Multimodal AI Systems(Wearables) *Ongoing*

- Developing an adaptive fusion architecture that leverages real-time environmental context to model and predict human attention inspired by human cognitive functions.
- Leveraging large-scale egocentric datasets (Aria Everyday Activities, Ego4D) to design user-aware, adaptive multimodal fusion frameworks.
- Extending the framework to wearable sensing, examining how internal user states further strengthen contextual awareness (ex: cognitive load, emotions, etc.) - Using Meta Aria Glasses.
- Integrating audio, video, and gaze modalities to enhance robustness and interpretability. *[PyTorch, Python]*

Motion Sickness Modeling and Mitigation in Virtual Reality Gameplay *Oct 2023 – Feb 2025*

- Designed and conducted large-scale user studies (N=150) to examine relationships between physiological signals, HMU data, gaze behavior, and self-reported discomfort in VR gameplay.
- Collected, synchronized, and analyzed multimodal sensor data to improve the prediction of cybersickness onset.
- Designed and extended motion-sickness detection pipelines with new datasets and explainable AI (XAI) modules to identify key contributing features.
- Developed ML models for real-time detection of cybersickness in VR games, including exploratory data analysis and XAI visualization. *[Python, PyTorch, Unity, Tobii Pro SDK, Shimmer Sensors, C++]*

3D Object Transformation and Regeneration for Privacy in Mixed Reality *Apr 2022*

- Developed a novel state-of-the-art 3D-2D correspondence for better 3D point cloud understanding.
- Developed a 3D vision algorithm to add, delete, or change 3D object parts as required by the user, thereby regenerating transformed 3D objects at the other end.
- Evaluated our solution against a set of simulated privacy attacks.
- Implementation of the algorithm on a smart device to identify the practicality of deploying in Mixed Reality environments. *[PyTorch, Python]*

TEACHING/ AWARDS/ VOLUNTEERING

CS2100 : Computer Organisation *Jan 2024 - May 2024*
Conducted tutorial for Data representation systems, Combinational and sequential circuit design techniques, ISA, Memory, I/O. [Average Teaching Feedback Rating: 4.4/5 (Above School Average: 4.2/5)]

National University of Singapore (NUS) Research Scholarship *2023 - 2027*
Fully-funded doctoral fellowship awarded covering tuition fees and a monthly stipend for 4 years.

Reviewer
CHI 2026 · ICIS 2024 · MERCon 2024