

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

Bachelor of Science in Engineering (Electronic and Telecommunication Engineering)

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, physiological, 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

HeadRoom: Lightweight, Edge-deployable Pipeline for Adaptive Notification Routing

Under Review at UIST '26

Dinithi Dissanayake, Prasanth Sasikumar, Suranga Nanayakkara

Sensing and Responding to Internal User States: A Systematic Literature Review of User-Aware Adaptive Assistive Wearables

Under Review at ACM Computing Surveys

Dinithi Dissanayake, Hyong Woon Lee, Moritz Messerschmidt, Yize Wei, Suranga Nanayakkara

Interrupting Autopilot: Evaluating Sensory Interventions for Momentary Self-Regulation

CHI EA '26

Dinithi Dissanayake, Muftee Mysan, Yifei Luo, Timothy Antoni, Peter Cleveland, Prasanth Sasikumar, Suranga Nanayakkara

Two-Stage Multimodal Framework for Emotion Mimicry Intensity Prediction

CVPR Workshops '26 (Forthcoming)

Dinithi Dissanayake, Shaveen Silva, Ovinidu Atukorala, Prasanth Sasikumar, Suranga Nanayakkara

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

Bridging the Gulf of Endorsement: Enabling Automatic Endorsement of Cognitive Augmentation Systems

Manuscript in preparation for submission

Hyong Woon Lee, Dinithi Dissanayake, Dixon Rajendran, Punyawee Anunpattana, Suranga Nanayakkara

Sensory Spotlight: Dynamic Multimodal Fusion for Anticipating Human Attention

Manuscript in preparation for submission

Dinithi Dissanayake, Malsha de Zoysa, Sachini Shermila, Chitrakleha Gupta, Suranga Nanayakkara

SELECTED RESEARCH PROJECTS

Context-Aware Multimodal AI for Wearable Systems

Ongoing

- Developing multimodal AI frameworks for wearable systems that use first-person sensing to infer user states such as attention, cognitive load, and other context-dependent internal states.
- Investigating how signals from egocentric video, audio, gaze, and physiological sensing can be effectively combined to build context-aware models of human behavior in everyday settings.
- Designing adaptive fusion strategies that dynamically prioritize the most informative modalities, with a focus on robustness, interpretability, and responsiveness to changing user and environmental conditions.
- Leveraging large-scale first-person datasets (e.g., Aria Everyday Activities, Ego4D) and wearable platforms such as Meta Aria Glasses to study real-world multimodal perception and user-aware AI.
- Exploring how multimodal fusion in wearable systems can support more personalized, human-centered, and context-sensitive intelligent assistance. [[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

Teaching Assistant for 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)]