

RESEARCH INTERESTS

Multimodal machine learning (vision, language, wearable sensors) for cognitive assistance, Egocentric human activity recognition, Real-time and edge-optimized ML systems, Human-centered AR/VR interfaces and interaction.

PUBLICATIONS (SELECTED)

Weerasinghe, K., Ge, X., Heick, T., Wijayasingha, L.N., Cortez, A., Satpathy, A., Stankovic, J., and Alemzadeh, H. (2026) *EgoEMS: A High-Fidelity Multimodal Egocentric Dataset for Cognitive Assistance in Emergency Medical Services*, to appear in Proceedings of the 40th **AAAI Conference on Artificial Intelligence (AAAI-26)**, AI for Social Impact Track. arXiv preprint arXiv:2511.09894.

Weerasinghe, K., Janapati, S., Ge, X., Kim, S., Iyer, S., Stankovic, J. A., & Alemzadeh, H. (2024) **Real-Time Multimodal Cognitive Assistant for EMS**, in 9th **ACM/IEEE IoT-DI** Conference on Internet of Things Design and Implementation at CPS-IoT Week, Hong Kong

Weerasinghe, K., Roodabeh, S. H. R., Hutchinson, K., & Alemzadeh, H. (2024) **Multimodal Transformers for Real-Time Surgical Activity Prediction**, in 2024 IEEE International Conference on Robotics and Automation **ICRA**, Yokohama, Japan,

Weerasinghe, K., Tennakoon, S. C., Kularatne, K. N. U., Nawinne, I., Ragel, R., & Jayakody, H. (2021) **Using Near-Infrared Spectroscopy for Vein Visualization**, In **IEEE ICIAfS** 10th International Conference on Information and Automation for Sustainability

WORK EXPERIENCE (SELECTED)

CURRENT, FROM AUG 2022 (FT)

University of Virginia

Research Assistant, Teaching Assistant

During this time, I am working on fine-grained human action recognition for robot-assisted surgery, cognitive assistant systems for emergency responders on resource-constrained edge devices, and open-source multimodal datasets for skilled activities. These works have been published on **AAAI 2026**, **ICRA**, **IoTDI** in **CPS-IoT week of 2024**.

SEP 2021 – DEC 2022 (PT)

University of Peradeniya

Research Assistant

This position involved developing an anomaly detection system for injection molding using computer vision, enabling real-time safety monitoring in industrial automation. This system has been deployed in Mona Exports pvt ltd in Sri Lanka and is functioning to this date.

AWARDS (SELECTED)

2025 **AAAI Student Scholarship Award**

AAAI Student Scholarship Program 2026

2025 **Winner Research Poster**

UVA AI/ML Research Fair 2025, University of Virginia

2024 **Runner-up: Best Research Poster**

ECE Research Poster, University of Virginia

2021 **Best Research Article**

EscaPe, University of Peradeniya

PROJECTS (SELECTED)

Cognitive Assistance & Data Collection System for Augmented Reality AI Assistance in Emergency Medical Services (Ongoing Research)

Designed and deployed a comprehensive software-hardware platform for capturing high-fidelity egocentric data from EMS responders during simulated emergency scenarios. The system integrates GoPro cameras, smartwatches, ToF sensors, and depth cameras to record multimodal data including hand movements and CPR quality metrics, developed in close partnership with EMS agencies across Virginia.

Context-Aware Augmented Reality for Cognitive Assistance in EMS – Ongoing Research

Developing a context-aware AR cognitive assistant system for cooperative situational awareness in medical emergencies utilizing a multimodal action recognition model optimized for resource-constrained devices achieving state-of-the-art performance.

COVID-19 Real-time ICU Patient Monitoring System | Voluntary Project

Designed and implemented a real-time remote ICU monitoring system within 3 days, enabling centralized monitoring of patient vitals to reduce health personnel's exposure risk and increase the efficiency of patient monitoring.

EDUCATION

CURRENT **PhD Computer Engineering**

ADVISOR: HOMA ALEMZADEH

GPA: 3.84

University of Virginia

2016-2021 **BSc Computer Engineering**

GPA: 3.70

University of Peradeniya

REFERENCES

NAME **Dr. Homa Alemzadeh**

EMPLOYER *University of Virginia*

NAME **Prof. John Stankovic**

EMPLOYER *University of Virginia*

SERVICES (SELECTED)

2024 **Voluntary Mentor**

*Senior Capstone Project
Charlottesville High School*

2024 **External Reviewer**

ICCPs 2025, IEEE S&P 2025, ICRA 2025

2021 **Voluntary Developer**

Covid-19 ICU Patient Monitoring System