

Keshara Weerasinghe

AI/ML Research Intern

PhD Candidate in Computer Engineering | University of Virginia

cjh9fw@virginia.edu | Website | LinkedIn | GitHub | Full CV

RESEARCH INTERESTS

Multimodal and Egocentric Activity Recognition, Human-centered AI Systems, Real-time Cognitive Assistance, Dependable AI for Safety-critical and Resource-Constrained Environments.

EDUCATION

University of Virginia

PhD in Computer Engineering (GPA: 3.86/4.00)

Charlottesville, VA

August 2022 – Present

- **Relevant Coursework:** Advanced Embedded Systems, Advanced Computer Architecture, Dependable Computing Systems, Machine Learning and Image Analysis, Reinforcement Learning.

University of Peradeniya

BSc in Computer Engineering (GPA: 3.70/4.00)

Peradeniya, Sri Lanka

November 2016 – September 2021

- **Relevant Coursework:** Embedded Systems, Data Structures & Algorithms, Operating Systems, Programming Methodology, Computer Architecture, Advanced Computer Communication Networks, Advance Database Systems.

SELECTED PUBLICATIONS

- **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. **AAAI 2026 AISI Track** Acceptance Rate 24.1%
- **Weerasinghe, K.**, Janapati, S., Ge, X., Kim, S., Iyer, S., Stankovic, J. A., & Alemzadeh, H. (2024). Real-Time Multimodal Cognitive Assistant for Emergency Medical Services. **IoTDI 2024** Acceptance Rate 36.7%
- **Weerasinghe, K.**, Roodabeh, S. H. R., Hutchinson, K., & Alemzadeh, H. (2024). Multimodal Transformers for Real-Time Surgical Activity Prediction. **ICRA 2024** Acceptance Rate 44.8%

TECHNICAL SKILLS

Machine Learning & Perception: Deep Learning, Transformers, Multimodal Learning, Activity Recognition, Computer Vision, Sensor Fusion, Real-Time / Edge AI Inference

Frameworks & Scientific Computing: PyTorch, CUDA, OpenCV, NumPy, SciPy, Pandas, Matplotlib

Programming & Systems: Python, C, C++, Java, Go, Linux, Embedded AI (NVIDIA Jetson, Vuzix AR Glasses)

Data Engineering & Experimentation: Multimodal Dataset Design, Annotation Pipelines, Data Synchronization, Visualization Tools, Performance Benchmarking

Cloud & Software Infrastructure: Microsoft Azure, AWS, Docker, CI/CD (GitHub Actions), REST APIs, NodeJS, Angular

Sensors, Protocols & Hardware: Azure Kinect SDK, Smartwatch IMU Integration, MQTT, HL7 Medical Protocol, PCB Design, CAD/CAM, Rapid Prototyping

EXPERIENCE

Graduate Research Assistant

August 2022 – Present

Charlottesville, VA

University of Virginia - Link Lab

- Developing **CognitiveEMS**, a context-aware AR assistant for EMS responders. Built video-based action recognition models optimized for edge devices (NVIDIA Jetson) using multimodal sensor data.
- Lead the development of a unified hardware-software data collection system integrating Azure Kinect, GoPro, and Smartwatches to capture high-fidelity egocentric datasets.
- Developed real-time multimodal activity recognition model for **robot-assisted surgery**, leveraging Transformers to predict surgical activities and improve operational reliability.
- **Tech Stack:** Python, PyTorch, C++, CUDA, Azure Kinect SDK, Android, Java, Vuzix AR Glasses.

Trainee Software Engineer	Mar 2021 – Sep 2021
99x Technology	Colombo, Sri Lanka
<ul style="list-style-type: none"> – Contributed to development of enterprise-scale web applications, focusing on authentication, localization, and cloud-integrated services. – Built REST APIs and supported CI/CD pipelines for automated testing and deployment. – Tech Stack: Angular, .NET Core, C#, Azure, TypeScript. 	
Instructor / Teaching Assistant	September 2021 – July 2022
University of Peradeniya	Peradeniya, Sri Lanka
<ul style="list-style-type: none"> – Conducted lab sessions for Computer Architecture and Image Processing; mentored undergraduate capstone projects. – Developed an industrial anomaly detection system for injection molding using computer vision on Raspberry Pi for real-time safety monitoring. – Tech Stack: Python, OpenCV, C, Raspberry Pi, Pi Camera, IR Imaging 	

TECHNICAL PROJECTS (SELECTED)

Open-Source EMS Data Collection System <i>Lead Developer</i>	2024
<ul style="list-style-type: none"> – Engineered a scalable multimodal recording system capturing synchronized video, speech, and smartwatch IMU data for multi-person activity capture. – My Contribution: System architecture design, Android application development and GoPro API integration – Tech Stack: C++, Python, Azure Kinect SDK, GoPro API, Android. 	
COVID-19 Real-Time ICU Monitoring System <i>Full-Stack Developer</i>	2021
<ul style="list-style-type: none"> – Developed a remote vital monitoring system connecting to ICU monitors via HL7 protocols. – My Contribution: Frontend development, Network architecture design and deployment – Tech Stack: Go (Golang), NodeJS, PostgreSQL, HL7 Protocol, WebSocket, Cisco IOS. 	
Health-Watch (Wearable Remote Vital Monitoring) <i>Embedded Systems & Hardware (Team Project)</i>	2019
<ul style="list-style-type: none"> – Built a wearable + web/mobile monitoring prototype for elderly/patients to stream basic vitals for remote viewing. – My Contribution: PCB design/manufacturing, ESP8266 firmware (C/C++), MQTT integration, and CAD/CAM enclosure design + fabrication. – Tech Stack: ESP8266, C/C++, MQTT, NodeJS, Vue, MongoDB, JavaScript, PCB Design, CAD/CAM. 	

AWARDS & ACHIEVEMENTS (SELECTED)

- **AAAI Student Scholarship (2026):** Travel grant for EgoEMS paper presentation.
- **1st Place, UVA AI/ML Resource Fair (2025):** Best Poster for CognitiveEMS research.
- **Best Project/Product - SLASSCOM Ingenuity Awards (2021):** National award for ICU Monitoring System.

LEADERSHIP & SERVICE (SELECTED)

- **Reviewer:** ICCPS 2025, IEEE S&P 2025, ICRA 2025.
- **Undergraduate Mentor (UVA):** Mentored 6+ interns on research methodologies and capstone projects.
- **Voluntary Mentor (CHS / UVA Link Lab):** Mentored senior capstone team on system design, manufacturing, and project presentations.
- **Community Service:** Designed and manufactured 10,000+ face shields distributed to Sri Lankan hospitals during Covid-19.

REFERENCES

- **Prof. Homa Alemzadeh**
Professor in Electrical and Computer Engineering
Department of Electrical and Computer Engineering, School of Engineering and Applied Science, University of Virginia.
ha4d@virginia.edu
- **Prof. John Stankovic**
BP America Professor Emeritus, Director of the Link Lab, Emeritus
Department of Computer Science, School of Engineering & Applied Science, University of Virginia.
stankovic@cs.virginia.edu