

Sruti Srinidhi

 Sruti Srinidhi |  srutisrinidhi.com |  ssrinidh@andrew.cmu.edu

SUMMARY

I am a PhD researcher developing cognitive assistants that bridge AI, human-computer interaction, and extended reality to enhance physical world task performance. My work lies in multimodal machine learning and LLMs, 3D scene understanding, and natural language-driven XR program generation with focus on physical grounding and personalization. I am passionate about creating human-centered AI systems that provide contextual, spatially-aware assistance for real-world applications.

EDUCATION

Carnegie Mellon University

Aug. 2023 - Present

PhD in Electrical and Computer Engineering

Advisor: Anthony Rowe

Carnegie Mellon University

Aug. 2019 - May 2023

B.S. in Electrical and Computer Engineering

Additional Major: Human Computer Interaction

RESEARCH EXPERIENCE

Interactive XR Program Generation through Natural Language

2024-2025

Developed an LLM-powered system that generates interactive XR programs from natural language prompts, improving development speed and accuracy over existing approaches through smart documentation retrieval and iterative feedback loops. Paper under review at IEEE VR.

XR and LLM Based Cognitive Assistant

2023-2025

Created a system that integrates XR with multimodal LLMs using a split client-server architecture where physical world data can be captured and processed, used for inference with LLMs. LLM responses are represented in XR anchored in the physical world. Developed a cognitive assistant application on this system that assists a user through a task with stepwise instructions and live feedback, create XR overlays to guide the user, and answer user questions in context of the physical environment. Achieved real-time performance through optimized client-server architecture and multimodal data processing.

3D Model Semantic Understanding

2024-2025

Developing semantic search and retrieval system for 3D models using joint embedding spaces for text and 3D geometry. Focuses on visual and motion-based queries to enhance scene understanding and accelerate virtual environment creation. Work under review at IEEE VR.

Ingestible Sensor Pill Research

2022 - 2023

Developed an NFC-based capsule to detect swelling in the throat and optimizing circuit parameters for reliable throat swelling detection. Aspects of the research I was involved in include designing the system, calibrating resistor, capacitor, and coil configurations for optimal NFC performance. Advised by Dr. Swarun Kumar.

IoT Device Detection Research

2021 - 2022

Worked on creating an application to detect the presence of hidden IoT devices in a room. Worked on the detection of devices and localization of their locations in the room. Also worked on XCode and Unity for app development. Advised by Dr. Vyas Sekhar.

Handwashing Monitoring Research

2020 - 2021

Machine learning based analysis of structural vibration sensing data to reliably detect handwashing occurrence. Advised by Dr. Pei Zhang.

INDUSTRY EXPERIENCE

Research Intern, Bosch

2024

Worked on extending and adapting my prior research on an eXtended Reality (XR) and Large Language Model (LLM) based cognitive assistant application for various departments within Bosch.

Software Engineering Intern, NVIDIA

2022

Worked on feature development and testing for the autonomous vehicles team at NVIDIA. Key work accomplished includes creating a platform to check real time status of sensors in the car to verify the collected data's integrity, as well as improve traceability of errors in the car software platform.

Software Engineering Intern, Naval Nuclear Laboratory

2021

Designed and developed a tool using Qt and C++ to autogenerate software by drawing electrical diagrams. Also created various JSON schemas to verify and validate formats of objects across different products. Additionally, created REST API scripts to automate integration of version control documentation.

Research Intern, University of Michigan

2020

Creating models and simulations of households and behaviors to predict and analyze the spread of Covid-19 at University of Michigan, Computational Human Computer Interaction lab.

PUBLICATIONS

Sruti Srinidhi, Edward Lu, Anthony Rowe, "XaiR: An XR Platform that Integrates Large Language Models with the Physical World", *23rd IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, October 2024, Seattle, WA. **Won Best Student Paper Award**

<https://doi.ieeecomputersociety.org/10.1109/ISMAR62088.2024.00091>

Srinidhi, Sruti, et al. "An XR Platform that Integrates Large Language Models with the Physical World." *Proceedings of the 23rd ACM Conference on Embedded Networked Sensor Systems*, 2025.

<https://doi.org/10.1145/3715014.3724366>

Junbo Zhang, Gaurav Balakrishnan, **Sruti Srinidhi**, Arnav Bhat, Swarun Kumar, and Christopher Bettinger. "NFCapsule: An Ingestible Sensor Pill for Eosinophilic Esophagitis Detection Based on near-Field Coupling." *Proceedings of the 20th ACM Conference on Embedded Networked Sensor Systems (SenSys '22)*.

<https://doi.org/10.1145/3560905.3568523>

Jonathon Fagert, Amelie Bonde, **Sruti Srinidhi**, Sarah Hamilton, Pei Zhang, and Hae Young Noh. "Clean Vibes: Hand Washing Monitoring Using Structural Vibration Sensing." *ACM Trans. Comput.*

HONORS AND AWARDS

Best Student Conference Paper – ISMAR 2024	<i>2024</i>
Extended Reality Technology Center (XRTC) Best Poster Award	<i>2024</i>
Carnegie Institute of Technology Dean's Fellowship First Year Engineering Fellowship by CMU's college of Engineering	<i>2023</i>
CMU Senior Leadership Award Award for leadership contribution during my undergraduate years at CMU	<i>2023</i>

TALKS

Bosch Technical Colloquium (Real Time Distributed Systems) XaiR: An XR Platform that Integrates Large Language Models with the Physical World	<i>2025</i>
HCI Seminar Talk at Columbia University Using Large Language Models to Understand the Physical World	<i>2024</i>
AREA Research Webinar XaiR: An XR Platform that Integrates Large Language Models with the Physical World	<i>2024</i>
BoCSE - Bosch Internal Conference Building Smart Physical World Assistants: AI-Driven Spatial Guidance and Expressive XR Program Generation	<i>2024</i>

TEACHING AND LEADERSHIP EXPERIENCE

Teaching Assistant for Introduction to XR Systems	<i>Fall 2025</i>
Teaching Assistant for Distributed Embedded Systems	<i>Spring 2024</i>
Teaching Assistant for Introduction to Embedded Systems	<i>Spring 2023, Fall 2022</i>
Supplemental Instructor for Introduction to Electrical and Computer Engineering - <i>Spring 2022</i>	<i>Fall 2020</i>
Head of Mentoring, Society of Women Engineers CMU Chapter	<i>2021-2022, 2024-2025</i>

SKILLS

Programming Languages: Python, JavaScript, C, MATLAB, C++

AI/ML Frameworks: PyTorch, Hugging Face Transformers, OpenCV, scikit-learn, NumPy, Pandas, Langchain

XR/3D Technologies: Unity, Arena Platform, WebXR

HCI/UX Methods: User studies, usability testing, design thinking, prototyping, qualitative/quantitative analysis

Hardware/Embedded: Arduino, Raspberry Pi, NFC systems, sensor integration