Heng Sun

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Summary

Ph.D. applicant in Computer Science with 3+ years of research experience in machine learning for healthcare. My work focuses on multimodal learning, real-time clinical monitoring, and building deployable AI systems for high-stakes clinical environments. Through collaborations with clinicians, I aim to develop reliable, interpretable, and human-centered AI methods that enhance clinical decision-making and improve patient outcomes.

Education

University of Florida (Gainesville, FL), BS in Computer Science — Aug 2019 – May 2023

- GPA: 3.63/4.0
- **Coursework:** Data Structure & Algorithms, Operating System, Data Science, Machine Learning, Deep Learning (Graphics), Computer Network Fundamentals

Publications

Enhancing EHR Systems With Data From Wearables: An End-to-End Solution for Monitoring Post-Surgical Symptoms in Older Adults — Dec 2024

Heng Sun, Sai Manoj Jalam, Havish Kodali, Subhash Nerella, Ruben D. Zapata, Nicole Gravina, Jessica Ray, Erik C. Schmidt, Todd Matthew Manini, Parisa Rashidi

Proceedings of the 30th Annual International Conference on Mobile Computing and Networking (ACM MobiCom '24), pp. 2282–2289.
doi: 10.1145/3636534.3698118

Research Experience

Undergraduate Research Assistant, University of Florida Biomedical Engineering Department – Gainesville, FL — Oct 2023 – Present

- Developed TIBBY, an AI-powered wearable system that captures clinical speech interactions and generates structured documentation in real time (patent pending).
- Designed multimodal machine learning pipelines for clinical video analysis, including fine-tuned YOLO models for posture, behavior, and activity detection.
- Built annotation and dataset creation tools enabling automated face tracking, temporal labeling, and efficient clinical video validation.
- Engineered real-time ICU monitoring pipelines supporting continuous multimodal recording, on-device inference, and bandwidth-aware data transfer.
- Collaborated with clinicians to ensure system usability and deployment feasibility in real-world healthcare environments.

Projects

Real-Time ICU Monitoring and Processing System — Aug 2025 - Present

- Developed continuous ICU video acquisition pipelines supporting RGB and depth sensors.
- Implemented user session–independent recording and live preview to support clinical oversight.
- Designed dual local–remote storage and on-device inference pipelines to ensure reliability under bandwidth constraints.
- Integrated multi-camera synchronization mechanisms to support temporal alignment between RGB and depth streams for downstream behavior modeling.
- Collaborated with clinical partners to validate system reliability and identify target use cases such as fall-risk assessment and patient mobility monitoring.

TIBBY – AI-Powered Wearable System (Patent Pending) Mar 2025 - Present

- Built an end-to-end wearable AI system that captures clinical speech interactions and generates structured documentation at the point of care.
- Integrated context-aware retrieval of EHR information and real-time alerting to support bedside decision-making.
- Designed embedded sensing and inference pipelines optimized for continuous use in clinical workflows.
- Implemented lightweight on-device inference optimizations to enable continuous operation on limited hardware resources.

AI-Powered Content Summarization and Comment Extraction Tool Feb 2025 - Apr 2025

- Developed GPT-based models for long-form content summarization and semantic filtering.
- Built automated pipelines for extracting hierarchical discussion structures from web pages.
- Developed automatic clustering algorithms to group user comments by semantic similarity for downstream topic analysis.

Object Annotation Tool Dec 2023 - Aug 2024

- Developed a multi-user annotation system for large-scale medical video labeling.
- Implemented automated tracking and ML-assisted suggestions to improve annotation efficiency.
- Created visualization tools comparing raw and labeled sequences for quality assurance.
- Integrated task-specific annotation modes (e.g., bounding boxes, activity segments, face landmarks) tailored to clinical video research needs.

ROAMM-EHR: Wearable Data Integration System Oct 2023 - Feb 2024

- Designed and developed a real-time monitoring system for wearable-derived physiological data.
- Developed a role-based access control system for clinicians, researchers, and administrators with custom data permissions.
- Engineered an automated emergency alert system that triggers emails to physicians when abnormal or high-risk data patterns are detected.
- Supported the integration of wearable sensor data with EHRs for post-surgical monitoring in older adults.
- Implemented anomaly detection pipelines to flag irregular mobility patterns indicative of post-surgical complications.
- Supported deployment and validation of the system in ongoing aging-research studies involving older adult populations.

Work Experience

Software Developer Intern, PathPoint Energy LLC – Houston, TX May 2023 – Sep 2023

- Developed and maintained the current gasoline trading platform.
- Implemented interactive features in the company's trading platform using modern web technologies.
- Integrated RESTful APIs using Python, and Django.
- Participated in Agile development cycles and sprint-based planning.

Skills

Languages: Python, JavaScript, TypeScript, C++, Java, Go, C#, SQL, MATLAB, R

Technologies: PyTorch, TensorFlow, YOLO, FastAPI, React, MongoDB, SQL Server, Git, Linux