

Harshit Sharma

Tempe, AZ | (315) 832-0553 | hsharm62@asu.edu
harshitsharma.is-a.dev | linkedin.com/in/harshit-sharma27 | github.com/anotherphdgrad
Google Scholar: scholar.google.com/citations?user=Ja7tYhcAAAAJ

Summary

Ph.D. candidate in Computer and Information Science at Arizona State University (expected December 2027); Research Scientist Intern at Optum, UnitedHealth Group (Summer 2026). Research focuses on trustworthy machine learning for health: privacy-preserving machine learning, explainable AI, and fairness for multimodal healthcare data, including medical records (EHR claims), wearables and nearables (physiological signals, IMU, thermal, UWB radar), and speech. Experience with LLMs and clinical text, generative models (diffusion), federated learning, foundation model adaptation in data-scarce settings, and signal processing. 13 peer-reviewed publications (6 more under review), including first-author ACM IMWUT papers and medical journal papers with clinical collaborators in addiction medicine, speech-language pathology, and geriatrics.

Education

Ph.D., Computer and Information Science	Expected December 2027
Arizona State University, Tempe, AZ	GPA: 3.98/4.0
B.S., Computer and Information Science	2019
BMS College of Engineering, Bangalore, India	GPA: 4.0/4.0

Experience

Research Scientist Intern (AI/ML)	June 2026 – August 2026
Optum, UnitedHealth Group	Mentor: Shruthi Hiremath

- Built TrajNote, a clinical text-serialization framework that converts longitudinal EHR claims (2.69M patients, 115.8M visits) into natural language, enabling off-the-shelf language models to model structured medical codes without pretraining a custom foundation model.
- Designed a dual-window temporal modeling strategy with schema-constrained, grammar-guided LLM generation to produce valid structured outputs for high-risk clinical workflows.
- Benchmarked sequential architectures across multiple domain-specific text encoders, achieving a +3.9% absolute AUPRC improvement over production baselines for Emergency Department utilization prediction.
- Built a distributed embedding extraction pipeline over 25.14M clinical text chunks and ran subgroup fairness audits across Medicare, Medicaid, and Commercial lines of business.

Graduate Research Associate (Fulton Fellow)	2024 – Present
Arizona State University, School of Computing and Augmented Intelligence	Advisor: Dr. Asif Salekin

Graduate Research Assistant	2020 – 2024
Syracuse University, College of Engineering and Computer Science	Advisor: Dr. Asif Salekin

- Research in the Ubiquitous and Intelligent Sensing (UIS) Lab on privacy-preserving, explainable, and fair machine learning for multimodal health data from wearables and nearables (physiological signals, IMU, thermal and RGB video, UWB radar, speech).
- Built deep learning and multimodal fusion models for stress, craving, and arousal detection from wearable sensors (Empatica E4, Biopac: heart rate, electrodermal activity), thermal video, and speech (formants, MFCCs), including studies of patients with opioid use disorder in a real-world methadone clinic.
- Collaborated with clinicians and health researchers across addiction medicine, speech-language pathology, and occupational therapy, translating study protocols into ML pipelines and co-authoring medical journal papers.
- Developed privacy-preserving methods: defenses against speech emotion recognition via acoustic adversarial evasion (ACM IMWUT 2023), analysis of mental-health information leakage from zero-permission smartphone IMU sensors, and privacy- and utility-preserving synthetic data generation.
- Developed a fairness-enhancing federated learning method based on loss-landscape curvature alignment (CurvFed, ACM IMWUT 2026) and fairness evaluation without demographic labels.

- Adapted foundation models and personalized models for data-scarce health sensing (thermal foundation model adaptation for stress and craving detection; context-robust personalization, ACM IMWUT 2025).
- Applied explainable AI (SHAP, LIME, Captum) to deep learning models, including interpretable models of psychophysiological arousal in children who stutter (ACM IMWUT 2022).
- Developed diffusion-based generative models for acoustic-articulatory representation learning, and processed UWB radar point clouds (Vayyar, Walabot, Estimote) for human presence and health biomarker detection.

Research Assistant

M.I.N.D. Lab, Syracuse University

2019

Supervisor: Dr. Mark Costa

- Developed a Node.js and Neo4j graph database backend to collect and analyze physiological data supporting mindfulness interventions in AR/VR.

Technical Skills

Research Areas: Healthcare AI, Large Language Models (LLMs), Clinical NLP, Generative Models (Diffusion), Multimodal Learning, Foundation Model Adaptation, Privacy-Preserving Machine Learning, Federated Learning, Explainable AI, Algorithmic Fairness, Signal Processing, Time-Series Modeling, Model Quantization

Health Data: EHR and Claims Data (medical records), Wearable Sensors (Empatica E4, Biopac), Physiological Signals (ECG/heart rate, EDA), IMU, Thermal Imaging, UWB Radar, Clinical Speech

Languages: Python, C++, Java, Julia, SQL, JavaScript (Node.js), Android

ML Frameworks: PyTorch, PyTorch Mobile, Keras, scikit-learn, Flower (Federated Learning), Optuna, AI Fairness 360, SHAP, LIME, Captum

Tools: Git, GitHub, NumPy, Pandas, Matplotlib, Librosa, Praat, PraatIO, Neo4j

Publications

** denotes equal contribution*

Peer-Reviewed

- [1] **Harshit Sharma***, Shaily Roy*, Asif Salekin. “CurvFed: Curvature-Aligned Federated Learning.” ACM IMWUT, 2026. doi:10.1145/3810232
- [2] **Harshit Sharma**, Hao Zhang, Jakub Krzych, Lawrence Jones, Asif Salekin, Sucheta Soundarajan. “From Lab to Farm: Characterizing UWB-Based TDOA Localization Reliability for Dairy Cattle Monitoring.” IEEE DCOSS-IoT (Poster), 2026.
- [3] Bernardo Villa-Sánchez, Alexandra M. Reed, **Harshit Sharma**, Asif Salekin, Brianna Branson, Elyana Chacon, Diane E. Adamo, Sydney Y. Schaefer. “Comparing Task-Related Stress and Engagement Across Assessments in Older Adults: An Exploratory Study for Cognitive Screening.” Physical & Occupational Therapy in Geriatrics, 2026. doi:10.1080/02703181.2026.2715409
- [4] Tyler S. Oesterle, Yi Xiao, Nicholas L. Bormann, Dessa K. Bergen-Cico, Benjamin Lai, **Harshit Sharma**, Asif Salekin. “Wearable-Derived Measures of Stress Physiology in Patients with Opioid Use Disorder Treated with Methadone.” Drug and Alcohol Dependence Reports 20, 2026.
- [5] Yi Xiao, **Harshit Sharma**, Sawinder Kaur, Dessa Bergen-Cico, Asif Salekin. “Human Heterogeneity Invariant Stress Sensing.” ACM IMWUT 9(3), 2025. doi:10.1145/3749465
- [6] Yi Xiao, **Harshit Sharma**, Victoria Tumanova, Asif Salekin. “Psychophysiology-Aided Perceptually Fluent Speech Analysis of Children Who Stutter.” ACM/IEEE ICCPS (CPS-IoT Week), 2025. doi:10.1145/3716550.3722019
- [7] Sawinder Kaur, Avery Gump, Yi Xiao, Jingyu Xin, **Harshit Sharma**, Nina R. Benway, Jonathan L. Preston, Asif Salekin. “CRoP: Context-wise Robust Static Human-Sensing Personalization.” ACM IMWUT 9(2), 2025. doi:10.1145/3729483
- [8] Yi Xiao, **Harshit Sharma**, Zhongyang Zhang, Dessa Bergen-Cico, Tauhidur Rahman, Asif Salekin. “Reading Between the Heat: Co-Teaching Body Thermal Signatures for Non-intrusive Stress Detection.” ACM IMWUT 7(4), 2023. doi:10.1145/3631441
- [9] Brian Testa, Yi Xiao, **Harshit Sharma**, Avery Gump, Asif Salekin. “Privacy Against Real-Time Speech Emotion Detection via Acoustic Adversarial Evasion of Machine Learning.” ACM IMWUT 7(3), 2023. doi:10.1145/3610887

- [10] Nina R. Benway, Jonathan L. Preston, Asif Salekin, Yi Xiao, **Harshit Sharma**, Tara McAllister. “Classifying Rhoticity of /r/ in Speech Sound Disorder Using Age- and Sex-Normalized Formants.” INTERSPEECH, 2023.
- [11] **Harshit Sharma**, Yi Xiao, Victoria Tumanova, Asif Salekin. “Psychophysiological Arousal in Young Children Who Stutter: An Interpretable AI Approach.” ACM IMWUT 6(3), 2022. doi:10.1145/3550326
- [12] Nina R. Benway, Jonathan Preston, Elaine Hitchcock, Asif Salekin, **Harshit Sharma**, Tara McAllister. “PERCEPT-R: An Open-Access American English Child/Clinical Speech Corpus Specialized for the Audio Classification of /r/.” INTERSPEECH, 2022.
- [13] Arun Prakash Agrawal, Ankur Choudhary, **Harshit Sharma**. “An Empirical Study on the Issues of Traditional Defect Life Cycle in Agile Model.” ICAESMT, 2019.

Under Review

- [14] **Harshit Sharma**, Asif Salekin. “GRACE: Fair Low-Bit Quantization for Wearable Stress Sensing.” Under submission, HotMobile 2027.
- [15] **Harshit Sharma**, Yi Xiao, Asif Salekin. “CrossCue: Training-Time IMU Supervision for Contactless Stress Detection.” Under submission, ACM IMWUT 2027.
- [16] Sachin Deb, **Harshit Sharma**, Asif Salekin. “FABLE-Therm: Adaptation of Foundation Models for Stress and Craving Detection.” Under submission, AAAI 2027.
- [17] Shaily Roy, **Harshit Sharma**, Dan Adler, Tanzeem Choudhury, Asif Salekin. “Ethical Fairness without Demographics.” Under submission, ACM IMWUT 2027.
- [18] Yi Xiao, **Harshit Sharma**, Dessa Bergen-Cico, Asif Salekin. “ReSPIRE: Resilience-Conditioned Stress-Pretrained Inference for Craving Detection in Opioid Use Disorder.” Under review, ACM IMWUT 2027.
- [19] Nahin Kumar Dey, **Harshit Sharma**, Yi Xiao, Faysal Hossain Shezan, Asif Salekin. “Mental Health Leakage from Zero-Permission Inertial Motion Sensors.” Under review, USENIX 2027.

Fellowships and Awards

- | | |
|--|-------------|
| • Fulton Fellowship, Arizona State University (\$71,500) | 2024 – 2025 |
| • Lambda Research Grant (\$500 cloud compute credits) | 2026 – 2027 |
| • SUN Award, Arizona State University | 2025 |
| • 1st Runner-up, Siemens MakeIT Real Hackathon | 2017 |

Teaching

- | | |
|--|-------------|
| Teaching Assistant, Syracuse University | 2021 – 2022 |
| • CIS 675: Design and Analysis of Algorithms (graduate); CIS 477: Introduction to Analysis of Algorithms | |

Professional Service

- **Reviewer:** ACM IMWUT (2024, 2025, 2026); CHI 2026; HRI 2026; OzCHI 2025; ECIS (2023, 2025); CHI 2024 Case Studies; ETRA 2021 Workshop; ISWC 2021 Posters and Demos
- **Artifact Evaluation Program Committee:** ACM SenSys 2025
- **Student Volunteer:** ACM UbiComp 2022
- **Academic Program Senator:** Graduate Student Organization, Syracuse University (2022 – 2023)

Media Coverage

- Syracuse University News: AI and mindfulness-based interventions for opioid use disorder (syracuse.edu/stories/falk-addiction-studies-opioid-treatment)
- Syracuse University ECS News: privacy against real-time speech emotion detection (ecs.syracuse.edu/about/news/smart-speakers-smarter-protection)