

Sameer Neupane

PhD in Computer Science | AI/ML | Wearables | Human Computer Interaction

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📁 Portfolio in [LinkedIn](#) 🏠 [GitHub](#) 🎓 [Google Scholar](#)

PROFESSIONAL SUMMARY

Ph.D. in Computer Science with 7+ years of research experience in digital health, human-centered AI, and machine learning. Conducted and led large-scale, federally funded studies combining wearable sensing, longitudinal data, and large language models to enable personalized interventions and behavior change. Demonstrated expertise in HCI, data visualization, and interdisciplinary research, with publications in premier venues including CHI and UbiComp. Committed to advancing explainable AI systems for diagnostic support and scalable digital mental health applications.

EDUCATION

- **PhD, Computer Science** (GPA: 3.99) Memphis, TN
University of Memphis 09/01/2018 – 12/13/2025
 - ★ **Advisor:** Dr. Santosh Kumar
 - ★ **Research Focus:** Machine Learning, Deep Learning, Digital Health, Human-Computer Interaction, Data Visualizations
- **MS, Computer Science** (GPA: 3.99) Memphis, TN
University of Memphis 09/01/2018 – 5/10/2025
- **Bachelor of Technology in Electronics and Communication Engineering** (Grade: 78%) Anantapur, India
Jawaharlal Nehru Technological University Anantapur (JNTUA) 08/16/2010 – 06/17/2014

EXPERIENCE

- **Postdoctoral Scholar** San Francisco, CA
University of California San Francisco 02/02/2026 – Present
 - ★ **Wearable-Based Mental Health Modeling:** Developing multimodal, self-supervised AI models that integrate wearable biosignals and behavioral data to enable real-time detection of depression and anxiety, with validation against established clinical assessments (e.g., PHQ-9, GAD-7).
 - ★ **Human-in-the-Loop AI for Neurodevelopmental Assessment:** Developing deep learning models for multi-label classification of ADHD and autism spectrum disorder (ASD), producing four possible diagnostic outcomes (ADHD, ASD, ADHD+ASD, neither) and generating interpretable outputs by quantifying behavioral characteristics using both crowd-sourced annotations and automated models (e.g., large language models).
 - ★ **Just-in-Time Adaptive Interventions (JITAs):** Designing AI-driven frameworks to support timely, personalized mental health interventions in daily life, including exploratory work on EMA-informed, context-aware supportive prompts.
 - ★ **Behavioral Health and Cancer Prevention Research:** Expanding research into smoking and nicotine cessation by modeling stress-related cigarette cravings from wearable and contextual data to inform adaptive, preventative interventions.
- **Graduate Research Assistant** Memphis, TN
mDOT Lab (Center for Discovery, Optimization, and Translation of Temporally-Precise Interventions) 09/01/2018 - 12/13/2025
 - ★ **MOODS Study (CHI'24):** Achieved a 10% stress reduction and 85% app approval ratings by designing and leading the nationwide MOODS Study with 122 participants, integrating wearable AI and developing interactive visualizations. 21 billion data points collected in the study are being used to develop the first open-source PPG foundation model for stress detection and physiological state estimation (UbiComp'25).
 - ★ **Personal Informatics System:** Achieved 81% 30-day user retention rate by developing 16 interactive visualizations using Plotly and html to enhance self-reflection for stress management resulting 14 types of self-initiated behavioral changes.
 - ★ **Wearable-Integrated LLM Chatbots (CHI-EA'25):** Built and evaluated a GPT-4o driven chatbot for zero-shot real-time stress intervention via duoethnographic research, demonstrating that only 20% of detected stress events require intervention.
 - ★ **Asymptotic Models for Latent Stressor Frequency (UbiComp'25):** Developed mathematical models using asymptotic estimators to infer latent stressor frequency (5.39/day) from 100 days of wearable-triggered data, informing stress interventions.
 - ★ **Estimated Stressor Longevity for Just-in-Time Interventions:** Modeled real-life stressor durations from 100-day wearable data using Weibull survival analysis models; estimated half-lives ranged from 30–290 minutes.
 - ★ **Behavioral Change Prediction:** Designed and developed survival analysis models using Random Forest and Gradient Boosting with a C-index of 0.84 to predict user-initiated behavioral changes for personalized stress management.
 - ★ **LLM Finetuning:** Fine-tuned LLaMA 3.1 8B model for mental health disorder classification (4 classes) and stressor classification (9 classes), achieving 0.2 and 0.5 F1-score improvements, respectively.
 - ★ **LLM Assisted NER (FLAIRS'25):** Enhanced NER performance in Nepali by developing and evaluating state-of-the-art LLMs, improving F1-micro scores with semantic selection and self-verification, resulting in a precision increase from 0.50 to 0.66.
 - ★ **Opioid Study (Journal of Pain'24):** Collaborated with researchers at Johns Hopkins University to lead a field study on opioid use in sickle cell patients, analyzing the influence of affect and sleep on pain management in this population.

Senior Software Engineer

OpenText

Hyderabad, India

07/23/2014 – 05/18/2018

- ★ **Medical Records Capture:** Developed enterprise-level medical records image capture and retrieval software using Microsoft .NET, deployed in major healthcare organizations, ensuring secure and scalable data access.
- ★ **Customer Engagement:** Streamlined feature development based on customer feedback and supported JIRA requests for new features, resulting in enhanced system usability and overall performance.
- ★ **Intern Mentorship:** Led a team of three interns through the full project lifecycle—from initial planning to final delivery.

PROJECTS

- **RELIEF Study:** Integrated wearable AI and LLM using GPT-4o model for real-time interventions by designing and developing the end-to-end system for the RELIEF study targeting 200 participants for personalized stress interventions.
- **Agentic AI Retrieval System for University Information:** Designed a modular LLM-based question answering interface with support for RAG and table generation modes. Integrated LLaMA 3.1 and Mistral via Hugging Face Transformers, FAISS-based retrieval over university knowledge sources, and built a Streamlit frontend for dynamic model selection, prompting, and contextual QA.
- **Reflective Coach Agent: LLM-powered mental health AI agent:** Designed an interactive Streamlit system integrating Mistral-7B and FAISS to generate personalized end-of-day reflections. Engineered semantic memory retrieval using SentenceTransformer embeddings and per-user vector indexing to support longitudinal stressor analysis and proactive coping recommendation.
- **LLM Evaluation Dashboard:** Designed and implemented an evaluation platform to rank LLMs (e.g., GPT-4o, Claude-Sonnet) for stress intervention scenarios, enhancing decision-making frameworks.
- **Movie Recommendation Engine:** Designed a movie recommendation system with a responsive UI, integrating content-based and collaborative filtering to generate personalized suggestions from a database of 9,000+ movies and 100,000+ ratings.
- **Campus NLP Search Engine:** Developed an intelligent search platform tailored for University of Memphis students, enhancing campus information retrieval through advanced NLP techniques.

CERTIFICATIONS

- Generative AI with Large Language Models: Coursera (DeepLearning.AI)
- DeepLearning Specialization: Coursera (DeepLearning.AI)
- Deep Neural Networks with PyTorch: Coursera (IBM)
- Sequences, Time Series and Prediction: Coursera (DeepLearning.AI)
- Machine Learning with Python: Coursera (IBM)
- AWS Certified Cloud Practitioner: Udemy

AWARDS AND HONORS

- IEEE BHI 2025 NSF-EMBS-Google Sponsored Young Professional NextGen Scholar, IEEE BHI,'25
- Dissertation Completion Grant, University of Memphis, '25
- GSA Top 20 Under 35 Award, University of Memphis, '24
- Celebrate Student Success Award, University of Memphis, '24
- First Prize at 36th Annual Student Research Forum, University of Memphis, '24
- Research Investment in Science and Engineering (RISE) Doctoral Fellow, University of Memphis, '18
- Mahatma Gandhi Scholarship for Bachelor Degree, Ministry of External Affairs (India), '10

SERVICES/VOLUNTEERING

- Mentored 4 Ph.D. students (University of Memphis) and 3 software interns (OpenText)
- Organizer of the first Nepali Nights at the University of Memphis, '22
- First prize in the Memphis city soccer tournament with a team involving players from 6 different countries, '22
- DOST team (OpenText, India) which conducted various CSR activities including Blood Donation, '17
- Teacher for primary grade students in a local school (Hyderabad, India), '16

GRANT

- Assisted my PhD Advisor (Dr. Santosh Kumar) in writing grants
 - Drafting specific aims and research strategies
 - Designing figures

PUBLICATIONS (TOTAL CITATIONS: 64)

Published

1. **Neupane, S.**, Dongre, P., Gracanin, D., & Kumar, S. (2025, April). *Wearable Meets LLM for Stress Management: A Duoethnographic Study Integrating Wearable-Triggered Stressors and LLM Chatbots for Personalized Interventions*. In *Proceedings of the Extended Abstracts of the CHI Conference on Human Factors in Computing Systems* (pp. 1-8)
2. **Neupane, S.**, Saha, M., Ali, N., Hnat, T., Samiei, S.A., Nandugudi, A., Almeida, D.M. and Kumar, S., 2024, May. *Momentary Stressor Logging and Reflective Visualizations: Implications for Stress Management with Wearables*. In *Proceedings of the CHI Conference on Human Factors in Computing Systems* (pp. 1-19).
3. **Neupane, S.**, Saha, M., Almeida, D.M., & Kumar, S (2025). *How Many Times Do People Usually Experience Different Kinds of Stressors Each Day? Companion of the 2025 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp Companion '25)*.
4. Saha, M., Xu, M. A., Mao, W., **Neupane, S.**, Rehg, J. M., & Kumar, S. (2025). *Pulse-ppg: An open-source field-trained ppg foundation model for wearable applications across lab and field settings*. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, 9(3), 1-35.
5. Ellis, J.D., Samiei, S., **Neupane, S.**, DuPont, C., McGill, L., Chow, P., Lanzkron, S., Haythornthwaite, J., Campbell, C.M., Kumar, S. and Finan, P.H., 2024. *Sleep disruption moderates the daily dynamics of affect and pain in sickle cell disease*. *The Journal of Pain*, 25(7), p.104477.
6. **Neupane, S.**, Chapagain, J., Niraula, N. B., & Koirala, D. (2025). *Generative AI for Named Entity Recognition in Low-Resource Language Nepali*. *arXiv preprint arXiv:2503.09822*

Submitted

1. **Neupane, S.**, Moreno, A., Almeida, D.M., & Kumar, S (2025). *How Long Does the Influence of Real-Life Stressors Last — Going Beyond Physiological Spikes*
2. **Neupane, S.**, Lee, S. A., Saha, M., Almeida, D.M., & Kumar, S. *ATP: Using AI-triggered Prompts to Catch People in Stressful Moments and Predicting Their Likely Stressors*
3. **Neupane, S.**, Moreno, A., & Kumar, S (2025). *Predicting the Self-Initiation of Behavior Change via Personal Informatics of Real-Life Stressors*
4. Dongre, P., **Neupane, S.**, Chandrashekar N., Webb, C., Kumar, S. & Gracanin, D. *From Signals to Support: Exploring the Design of Wearable-LLM Integration for Mental Health with Experts*

PEER REVIEWS (27)

- Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies ('20, '21, '22, '23, '24, '25)
- ACM CHI conference on Human Factors in Computing Systems ('24,'25)
- ACM Transactions on Computing for Healthcare (HEALTH) ('24,'25)
- International Journal of Human-Computer Interaction ('25)
- JMIR Human Factors ('25)
- JMIR Research Protocol ('25)
- Australian Conference on Human-Computer Interaction ('23)