

Shreya Bali

PhD Student, Human-Computer Interaction
Carnegie Mellon University

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ABOUT ME

I'm a PhD student at Carnegie Mellon University developing AI agents that adapt to individual users and domain-specific contexts through real-time sensing and personalized interventions. As a former Software Engineer at Databricks, I combine industry expertise in large-scale systems with research in AI agent design, LLM adaptation, and user-centered evaluation. My research focuses on building AI systems that learn from user feedback, work on multimodal sensing (e.g., wearable data, behavioral signals), and provide contextually-aware support for complex workflows, with applications across workflow automation, health informatics and general human-AI collaboration.

RESEARCH INTERESTS

AI Personalization & Adaptation, Human-AI Interaction, Evaluation Frameworks for LLMs, Applied Machine Learning, Wearable Sensing

EDUCATION

Carnegie Mellon University

PhD in Human-Computer Interaction, School of Computer Science

Pittsburgh, PA
(Ongoing)

- Advisor: Prof. Mayank Goel, **GPA: 4.12/4.0**
- **Recipient: CMLH Generative AI in Healthcare Fellowship (\$100,000)**

Carnegie Mellon University

Master of Science in Computer Science

Pittsburgh, PA
2022

- Concentration: Research, **GPA: 4.14/4.0**
- Thesis: "Tools to Facilitate Machine Learning Product Development in Industry"

Carnegie Mellon University

Bachelor of Science in Computer Science, Minor in Machine Learning

Pittsburgh, PA
2020

- **University Honors, GPA: 3.93/4.0, Mortar Board Honor Society**

Selected Coursework

Coursework Spanning AI, HCI, Systems & Business

- **Advanced AI & Machine Learning:** Deep Reinforcement Learning, Intermediate Deep Learning, Machine Learning, ML and Sensing for Healthcare, Graduate AI, AI and Representation, Modern Regression, Probability Theory
- **Human-Computer Interaction:** Augmenting Intelligence, Designing Human Centered Software, Social Computing, Social/CS Perspectives of HCI, HCI Theory & Processes
- **Technology Commercialization/Business:** Commercializing Lab to Market, Product Management Essentials, HCI for Startups, Microeconomics, Macroeconomics
- **Computer Systems & Architecture:** Computer Architecture, Parallel Computer Systems, Intro to Computer Systems

EXPERIENCE

SmashLab, Carnegie Mellon University

PhD Research Assistant, Advisor: Prof. Mayank Goel

Pittsburgh, PA
Fall 2024 - Present

- Leading multiple research projects applying LLMs, human-AI interaction design, and wearable sensing technologies to challenges in personalized information systems, patient empowerment, and adaptive communication

- Developing end-to-end systems integrating novel algorithms with user-centered interfaces and validating system effectiveness in real-world environments including clinical settings and patient homes

Databricks Inc.

Software Engineer, Anti-Abuse and Authentication Platform

San Francisco, CA

2022 - 2024

- Architected and deployed machine learning-based abuse detection system processing daily authentication events and automatically detect abuse attempts
- Led cross-functional initiative for case-insensitive email authentication, improving user experience for existing and new customers; collaborated with Product, Design, and Customer Success teams
- Rearchitecting authentication microservices to improve system reliability; implemented comprehensive monitoring and alerting infrastructure
- Technologies: Scala, Apache Spark, Kubernetes, ML pipelines, distributed systems, security protocols

SELECTED HONORS AND AWARDS

- CMLH Generative AI in Healthcare Fellowship, Carnegie Mellon University (\$100,000) (2024)
- Academic In Residence, OUP Venture Capital (2024)
- CHI 2023 Best Paper Honorable Mention Award (Top 5% of submissions) (2023)
- 2nd Place, Natural Disaster Category, University of Toronto ProjectX Research Competition (2021)
- University Honors, Carnegie Mellon University (2020)
- Mortar Board National Honor Society (2020)
- Carnegie Mellon SURF Grant (2020) - *deferred due to pandemic travel restrictions*
- Dean's List (All eligible semesters, 2017-2020)
- Best AI Hack & Best Health Hack, PennApps XIX Hackathon (2018)
- State Commendation Award, Government of Chandigarh, India (2016)

RESEARCH EXPERIENCE

Expertise@Scale Lab, Carnegie Mellon University

Research Assistant, Advisor: Prof. Chinmay Kulkarni

Pittsburgh, PA

Spring 2021 - Summer 2022

- **ML Feature Ideation for Non-AI Experts:** Developed novel framework using analogical reasoning to enhance designer-led machine learning feature generation; created web platform with interactive cue cards, conducted user studies validating improvement in ideation diversity
- **ML Research Ecosystem for Industry Professionals (InToML Platform) :** Architected industry-focused ML research ecosystem with Pinterest-style interface and automated paper summarization; led full-stack development and user experience research with industry professionals
- Technologies: React, Node.js, Python, NLP libraries, user-centered design methodologies

eHeart Lab & Expertise@Scale Lab, Carnegie Mellon University

Research Assistant, Advisors: Prof. Geoff Kaufman, Prof. Chinmay Kulkarni

Pittsburgh, PA

Fall 2020 - Spring 2021

- Led interdisciplinary research on technology-mediated workplace social interactions and employee well-being
- Designed and deployed open-source Slack bot across 5 research labs; conducted longitudinal user studies and ethnographic interviews
- **First-authored CHI 2023 paper (Best Paper Honorable Mention)**
- Technologies: Node.js, Slack APIs, statistical analysis (R), qualitative research methods

MultiComp Lab, Carnegie Mellon University

Research Assistant, Advisor: Prof. Louis-Philippe Morency

Pittsburgh, PA

Fall 2019 - Summer 2020

- Developed state-of-the-art audio source separation algorithms using canonicalization techniques; achieved 15% improvement over existing methods on benchmark datasets
- Mentored 2 undergraduate researchers, leading weekly technical seminars and collaborative research projects
- **Selected for CMU SURF Grant (2020)** for continued research (deferred due to pandemic restrictions)
- Technologies: PyTorch, TensorFlow, signal processing libraries, GPU computing

ProjectX Research Competition, Carnegie Mellon University

Research Team Lead, Advisor: Prof. Reid Simmons

Pittsburgh, PA

Fall 2020

- Led 6-member team representing CMU in University of Toronto undergraduate research competition
- Developed novel spatio-temporal deep learning models for peatland fire prediction
- **Achieved 2nd place in Natural Disaster category**; presented research at ICML 2021 Climate Change AI Workshop
- Technologies: PyTorch, satellite image processing, time-series analysis, geospatial data

INDUSTRY INTERNSHIPS

Mumbai Indians Cricket Team - Reliance Jio, AI Center of Excellence

Software Engineer Intern

Bangalore, India

Summer 2021

- Developed end-to-end cricket video analysis pipeline using self-supervised learning techniques; achieved 85% accuracy in automated highlight detection and player tracking
- Implemented computer vision models for real-time sports analytics; delivered 20% efficiency improvement in content processing workflow
- Technologies: Python, OpenCV, PyTorch, video processing, MLOps pipelines

Morgan Stanley

Technology Summer Analyst

New York, NY

Summer 2019

- Engineered high-performance data extraction pipeline using Apache Spark and Scala; reduced processing time from 6 hours to 45 minutes for business intelligence workflows
- Developed automated analysis tools using Flask and Python; identified category inefficiencies saving \$2M+ annually in operational costs
- Technologies: Scala, Apache Spark, Python, Flask, SQL, financial data systems

PUBLICATIONS

Under Review

- Jill Fain Lehman, Alexander Maytin, Brian Chen, Shreya Bali, Riku Arakawa, Emma Russell, Haarika Reddy, Annalise Vaccarello, Christina Trinh, Dustin DeMeo, Mayank Goel, Bryan T Carroll, [Anonymized Title]

Published

- Shreya Bali, Riku Arakawa, Peace Odiase, Sherry Wu, Mayank Goel. [Anonymized Title] *Proceedings of the 2026 CHI Conference on Human Factors in Computing Systems*.
- Riku Arakawa*, Shreya Bali*, Oliver Lindheim, Mayank Goel. [Anonymized Title] *Proceedings of the 2026 CHI Conference on Human Factors in Computing Systems*.
- Riku Arakawa, Shreya Bali, Mayank Goel. "Context-Aware Assistant for Integrated Home Care: Empowering Elderly Patients and Their Care Networks." *CHI 2025 Workshop on Aging in Place*, 2025.
- Shreya Bali, Pranav Khadpe, Geoff Kaufman, Chinmay Kulkarni. "Nooks: Social Spaces to Lower Hesitations in Interacting with New People at Work." *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, 2023. **Best Paper Honorable Mention Award**.
- Shreya Bali*, Sydney Zheng*, Akshina Gupta*, Yue Wu*, Blair Chen*, Anirban Chowdhury*, Justin Khim. "Prediction of Boreal Peatland Fires in Canada using Spatio-Temporal Methods." *ICML 2021 Workshop on Tackling Climate Change with Machine Learning*, 2021. (*Equal contribution)
- Neha Arora Chugh, Shreya Bali, Ashwani Koul. "Integration of botanicals in contemporary medicine: road blocks, checkpoints and go-ahead signals" *Integrative medicine research*, 2018.

Thesis

- Shreya Bali. "Tools to Facilitate Machine Learning Product Development in Industry." *Master's Thesis, Carnegie Mellon University*, 2022.

Patent(s)

- Shreya Bali. "Biodegradable Plastic from Non-Edible Natural Polymer." (Granted) *Government of India*, 2021.

RESEARCH MENTORSHIP

- PhD: Peace Odiase (2024), Vikram Kumar (2024)
- Pre-PhD: Aaina Arun (2020), Mehul Aggarwal (2020)

PAPER REVIEWING

- ACM Conference on Computer Supported Collaborative Work (CSCW) 2024
- ACM Conference on Human Factors in Computing (CHI) 2024
- ACM International Conference on Multimodal Interaction (ICMI) Late-Breaking Results (2023)

MEDIA/SPEAKING

- CMU SCS News. “Reviving Office Chatter”, by Kayla Papakie (2022)
- CMU SCS News. “CMU Team Uses Machine Learning To Predict Peatland Fires”, by Byron Spice (2021)
- Chandigarh (India). Youth and Technology Panel (2021)
- CMU Undergraduate Research Panel (2020)
- CMU Meeting of the Minds. “Processing and Identifying Language Patterns in Patent Text” (2019)

VOLUNTEERING/ACADEMIC SERVICE

- **CMU HCII Graduate Student Association** (2025)
- **Admissions Committee:** CMU Summer Research Experience for Undergraduates (REU) (2024)
- **Vice President:** Carnegie Mellon University Debate Society (2022)
- **Founded, Undergraduate Research Reading Group:** Carnegie Mellon University Debate Society (2020)
- **Teaching Assistant:** Mathematical Foundations of Computer Science, CMU (Fall 2018, Fall 2019)

TECHNICAL SKILLS

- **Programming Languages:** Python, JavaScript/TypeScript, Scala, Java, R, Swift
- **Machine Learning:** PyTorch, TensorFlow, scikit-learn, Hugging Face, OpenAI APIs, MLOps
- **Web & Mobile:** React, Node.js, Flask, Chrome Extensions, iOS/WatchOS development
- **Data & Infrastructure:** Apache Spark, SQL, Kubernetes, Docker, AWS, distributed systems
- **Research Methods:** User-centered design, quantitative studies, qualitative studies