Anjali Khurana Rai

PhD Candidate, Simon Fraser University

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EDUCATION

Ph.D. in Computing Science - Simon Fraser University (SFU), Canada Sept. 2021 – Sept. 2025

- **Focus:** Human-AI Interaction, LLMs/Agents, software help-seeking | **Supervisor:** Dr. Parmit Chilana
- **Research:** Understanding how users perceive failures in LLM assistants and Augmented Reality (AR)/mixed reality applications and designing effective human-LLM/Agent collaboration
- **GPA:** 4.02/4.33 | **Research Collaborations:** Meta Reality Labs, Stanford University, ETH Zurich
- **Courses:** Natural Language Processing, Special Topics: AI for Business, Special Topics in Databases, Technical Writing and Research Communication

MSc in Computing Science - Simon Fraser University (SFU), Canada Sept. 2019 – Aug. 2021

- **Focus:** Human-Computer Interaction, Explainable AI | **Supervisor:** Dr. Parmit Chilana
- **Thesis:** ChatrEx: Designing Explainable Chatbot Interfaces for Enhancing Usefulness, Transparency, and Trust
- **GPA:** 4.13/4.33 | **Awards:** Graduate Fellowship ($6500)
- **Courses:** Human-Computer Interaction, Machine Learning, Quantitative research methods, Visualization, Design/Analysis of Algorithms

B.Tech Computer Science - PEC University of Technology, India Aug. 2014 – Oct. 2018

- **GPA:** 3.5/4.0 (8.50/10.0)
- **Awards:** Women Rank Opener (JEE Mains Rank: 2827); Full tuition-fee scholarship (Top 2%)

SKILLS HIGHLIGHTS

HCI Methods: Usability Testing, Qualitative research, Quantitative experiments, Survey Design, Interactive design and prototyping, Visual design solutions, User Interviews, Statistical Analysis, Wizard-of-Oz, Think-aloud protocol, User personas, Heuristic Analysis, Video/Gesture Analysis

AI/ML Tools: Open AI GPT models, LangChain, Anthropic Claude, Meta AI Llama Models, Retrieval Augmented Generation (Hybrid-RAG, GraphRAG), LLM Agents, Prompting (Few-shot, Chain-of-thought), Activation Steering, Linear Probes, Fine-tuning LLMs, Vector Embeddings, Keras, PyTorch, Scikit-learn, Pandas

Programming Languages: Python, Java, JavaScript, C, HTML, SQL

Other Libraries, ToolKits and Frameworks: Axure, D3.js, Figma, Balsamiq, Android Studio, JMP Data Analysis Software, SPSS, SurveyMonkey, Unity

PUBLICATIONS

Khurana, A., Karlson, A., Collins, C., Yu, M., Jayaram V., Benko H., Chilana, P. (2025) ARGESTUREAID: A Natural Language-Based Context-Aware Conversational Assistant for Real-Time Mid-Air Gesture Discovery and Execution *[In Submission]*

Khurana, A., Su, X., Wang, A. Y., Chilana, P. (2025) Do It For Me vs. Do It With Me: Investigating User Perceptions of Different Levels of Automation in Copilots for Feature-Rich Software *ACM CHI Conference on Human Factors in Computing Systems (CHI 2025)* https://doi.org/10.1145/3706598.3713431 [25.1% acceptance rate]

Rezaie, M., Purdue, S., **Khurana, A.**, Chilana, P., Tory, M., Carpendale, S. (2024) Summary of the Workshop on Interactions for Supporting Explanations and Promoting Comprehension *In Companion Proceedings of the 2024 Conference on Interactive Surfaces and Spaces (ISS Companion '24)* https://doi.org/10.1145/3696762.3698046

Khurana, A., Subramonyam, H., Chilana, P. (2024) Why and When LLM-Based Assistants Can Go Wrong: Investigating the Effectiveness of Prompt-Based Interactions for Software Help-Seeking *ACM Conference on Intelligent User Interfaces(IUI 2024)* https://doi.org/10.1145/3640543.3645200 [24% acceptance rate]

Khurana, A., Chilana, P. (2024) Understanding Novice Users' Mental Models of Gesture Discoverability and Designing Effective On- boarding *In Companion of the 2024 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp Companion '24), October 5–9, 2024, Melbourne, VIC, Australia. ACM, New York, NY, USA, 6 pages* https://doi.org/10.1145/3675094.3678370

Khurana, A., Glueck, M., Chilana, P. (2023) "Do I Just Tap My Headset?": How Novice Users Discover Gestural Interactions with Consumer Augmented Reality Applications *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol. (IMWUT 2023) 7, 4, Article 165, December 2023* https://doi.org/10.1145/3631451

Khurana, A., Harjandi, P., Chilana, P. (2021) ChatrEx: Designing Explainable Chatbot Interfaces for Enhancing Usefulness, Transparency, and Trust. *Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 21)* [30% acceptance rate] https://doi.org/10.1109/VL/HCC51201.2021.9576440

Vidanapathirana, M., Pandhre, S., Raychaudhuri, S., & **Khurana, A.** (2020). Video Moment Localization using Object Evidence and Reverse Captioning *arXiv preprint :2006.10260.*

REFERRED WORKSHOP PAPERS, PRESENTATIONS AND POSTERS

Khurana, A., Chilana, P. Designing Semi-Automated Copilots: Balancing User Control and Guidance for Effective Human-Agent Collaboration *ACM CHI Workshop Workshop on Tools for Thought, Yokohama, Japan (2025)*

Khurana, A., Harjandi, P., Chilana, P. ChatrEx: Designing Explainable Chatbot Interfaces for Enhancing Usefulness, Transparency, and Trust. *Designing for People (DFP) Design Showcase, University of British Columbia (2023)*

Khurana, A., Chilana, P. Designing Explainable Chatbot Interfaces: Enhancing Usefulness, Transparency, and Trust, *ACM CHI Workshop Human-Centered Perspectives in Explainable AI (2022)*

Khurana, A., Harjandi, P., Chilana, P. ChatrEx: Designing Explainable Chatbot Interfaces for Enhancing Usefulness, Transparency, and Trust. *CS Research Day, Simon Fraser University (2021)*

INDUSTRY AND RESEARCH EXPERIENCE

Research Intern May 2025 – August 2025
Microsoft Research (FATE group), Dr. Jenn Wortman Vaughan, Dr. Q. Vera Liao *New York City, USA*

- Investigating mechanistic interpretability methods to enhance user perceptions of transparency and control in LLMs.

User Experience (UX) Graduate Research Assistant Nov. 2024 – May 2025
Interactive Experiences (ixlab), In collaboration with Meta Reality Labs (Dr. Amy Karlson, Dr. Chris Collins) *Burnaby, Canada*

- Designed and developed an LLM-driven contextual conversational help system to enhance gestural discoverability in consumer augmented reality applications
- Investigated LLM-generated guidance through a user study and follow-up interviews

User Experience (UX) Consultant Aug. 2024 – October 2024
XLScout Ltd. *Toronto, Canada*

- Delivered expert UX research consultancy to enhance the user experience for client's LLM-based drafting module on a SaaS platform, focusing on usability enhancements
- Designed and developed a patent drafting module powered by LLMs, creating intuitive user interfaces and workflows
- Conducted user interviews with patent drafters to identify workflows and challenges, designed an improved patent drafting interface, and evaluated its usability through user studies

User Experience (UX) Graduate Research Assistant May. 2024 – Sept. 2024
Interactive Experiences (ixlab) ixlab.cs.sfu.ca, In collaboration with ETH Zurich (Dr. April Wang) *Burnaby, Canada*

- Designed and developed semi-automated copilots using GraphRAG and LLM agent to improve user perception of utility, user control, and potential for software learnability
- Investigated LLM-generated software guidance through a within-subject experiment, follow-up interviews, Wizard-of-Oz and conducted further design exploration of semi-automated copilots

User Experience (UX) Graduate Research Assistant May. 2023 – March 2024
Interactive Experiences (ixlab), In collaboration with Stanford University (Dr.Hari Subramonyam) *Burnaby, Canada*

- Investigated LLM-generated software guidance and identify any gaps in users' mental models of LLMs vs. software application through a within-subject experiment and follow-up interviews
- Developed an LLM optimized for particular software contexts (e.g., Microsoft Excel and PowerPoint) by leveraging prompt engineering, GPT-4 and RAG Vector search.

User Experience (UX) Graduate Research Assistant Sept. 2021–April 2023
Interactive Experiences (ixlab) ixlab.cs.sfu.ca, In collaboration with Meta Reality Labs (Dr. Michael Glueck) *Burnaby, Canada*

- Applying qualitative research methods such as interviews, user studies to understand how users perceive failures and identify any gaps in their mental models-particularly by examining the gulfs of evaluation and execution-when interacting with AR/Mixed reality applications
- Applying bottom-up inductive analysis approach to gauge empirical insights into the user perceptions of AR/mixed reality environments.

User Experience (UX) Graduate Research Assistant Sept. 2019 – August 2021
Interactive Experiences (ixlab) ixlab.cs.sfu.ca, Simon Fraser University *Burnaby, Canada*

- Applied user-centered design, explainable AI & NLP pipelines to design and implement novel in-application explainable chatbot interfaces
- Developed web-based chatbot interfaces on top of spreadsheets (Google Sheets) to visually explain chatbot's decision and functionality during a conversational breakdown
- Carried out usability testing and interviews to evaluate different chatbot design interfaces
- Applied statistical, and bottom-up inductive analysis approach to gauge empirical insights into the strengths and weaknesses of different chatbot designs based on users' perceptions of usefulness, transparency and trust

Research Intern May 2019 – July 2019
Indian Institute of Technology (IIT) *Hyderabad, India*

- Worked on research and development of "Intelligent Self-Maintenance system" for Affordable Braille Printer
- Applied Regression Analysis to the data extracted from failure prone parts of Braille printer

Software/UX Engineer Feb 2017 – Aug 2019
Braiset Innovation Inc. *Atlanta, USA*

- Carried out competitive analysis of analogous products and user interviews to gather initial requirements
- Developed BabelSoft, a text-to Braille conversion software for Affordable Braille Printer using Java

Project Trainee | Android App developer Feb 2017 – Aug 2017
Slingshot Product Development Company slingshotpdg.com *Atlanta, USA*

- Conducted brainstorming sessions with clients (Grace Management Group and Kamado Joe) and team to gather requirements for designing mobile application
- **Kamado Joe:** Developed an android application using Amazon Web Services IOT to remotely control grills
- **Grace Management Group:** Developed android application that wirelessly controls the operation of the fragrance devices

TEACHING EXPERIENCE

Graduate Teaching Assistant May–Aug 2023; Sept– Dec 2021; Sept– Dec 2020
CMPT 363: User Interface Design, Simon Fraser University *Burnaby, Canada*

- Performed duties including marking interactive design projects, mentoring student project teams, giving tutorials on prototyping tools, etc.

Graduate Teaching Assistant Sept– Dec 2024
CMPT 415 D500 Special Research Projects, Simon Fraser University *Burnaby, Canada*

- Performed duties including marking interactive design projects, mentoring student project teams, etc.

PATENTS

"Braille Tablet", Indian provisional patent no. 201811035031, by Khushwant Rai, **Anjali Khurana** (2018)

PROJECTS

UXEva: UI evaluation tool powered by a large language model (LLM) agent UXEva — May 2024 – July 2024
- Developed a LLM agent that conducts a preliminary evaluation of your user interface and identifies design issues for improving the usability of your UI.

ChatrSQL: An explainable text-driven querying system | *Finetuning, Learnability* — Jan 2023 – April 2023
- Developed an explainable text-driven querying system that enables novice users to achieve SQL querying, thus enhancing database usability and learnability.
- Developed an intelligent agent by finetuning on a large language model (WikiSQL) for text-to-SQL translation task.

Robust Question Answering System Video | *Hyperparameter tuning, BERT* — Sept 2021 – Dec 2021
- Addressed the problem of robust question answering (QA) to build that can generalize to unseen data domains
- Experimented with three different approaches to improve the performance of our baseline on out-of-domain QA datasets: hyperparameter tuning, data augmentation and task adaptive pre-training.

Video Moment Localization using Object Evidence and Reverse Captioning arxiv — Sept 2019 – Nov 2019
- Addressed the problem of language-based temporal localization of moments in untrimmed videos
- Conducted experiments on improving Verb/Object Pair via BERT transformer

AWARDS AND HONORS

Nominated for Google PhD Fellowship, Simon Fraser University — May 2024
FAS Graduate Fellowship ($3500), Simon Fraser University — May 2024
Computing Science Travel Award ($1000), Simon Fraser University — May 2024
PhD Research Scholarship ($1800) x 2, Simon Fraser University — Fall 2023, Spring 2024
Graduate Fellowship ($7000), Simon Fraser University — May 2023
Nominated for Graduate Prize in Computing Science (Top 5) x2, Simon Fraser University — May 2023
Computing Science Graduate Fellowship ($4000), Simon Fraser University — Sept 2022
Graduate Fellowship ($7000), Simon Fraser University — Sept 2022
Computing Science Travel Award ($1000), Simon Fraser University — Sept 2022
FAS Graduate Fellowship ($3500), Simon Fraser University — May 2022
AI Week Talent Bursary program ($1500), Alberta Machine Intelligence Institute — April 2022
CMPT Graduate Fellowship ($1000), Simon Fraser University — Jan 2022
SFU Special Graduate Entrance Scholarship ($10000), Simon Fraser University — Sept 2021
SFU Graduate Fellowship ($7000), Simon Fraser University — Sept 2021
GPS Graduate Fellowship ($7000), Simon Fraser University — Sept 2021
SFU Graduate Fellowship ($7000), Simon Fraser University — Sept 2019
Platinum Award ($52000), Aarohan Social Innovation Awards, Infosys Foundation — Feb 2019
First position ($1750), Innovation Pitch, Red Brick Summit, IIM Ahmedabad — Nov 2019
Research Grant ($2000), Entrepreneurship & Incubation Cell, Red Brick Summit, PEC — July 2016
Full Tuition Fee Scholarship, 4 consecutive years, PEC University of Technology — 2014-2018

SELECTED PRESS

- **Graduate and Postdoctoral Studies, Simon Fraser University**
  https://www.sfu.ca/gradstudies/life-community/people-research/profiles/fas/2022/anjali-khurana.html

Talks

ARGestureAid: A Natural Language-Based Context-Aware Conversational Assistant for Real-Time Mid-Air Gesture Discovery and Execution, **Meta Reality Labs** — June 2025
Understanding user perceptions and needs around AI Controls, **Microsoft Research FATE** — June 2025
Designing Natural Language-Based Context-Aware Conversational Assistant for Real-Time Mid-Air Gesture Discovery and Execution, **CMPT 363 Simon Fraser University** — April 2025
Understanding Novice Users' Mental Models of Gesture Discoverability and Designing Effective Onboarding, **UBICOMP Doctoral Colloquium**, Australia — October 2025
Designing Explainable Chatbot Interfaces: Enhancing Usefulness, Transparency, and Trust, **ACM CHI Workshop** Human-Centered Perspectives in Explainable AI — May 2022

VOLUNTEER EXPERIENCE

Workshop Organizer, IEEE VIS 2025- Human Factors in Immersive Analytics (IA-HF Workshop)	November 2025
Workshop Organizer, ACM ISS 2024- Innovating Interaction Strategies for Enhanced Comprehension	October 2024
Student Volunteer, UbiComp / ISWC 2024, Melbourne, Australia	October 2024
Peer Reviewing, Graphics Interface (GI'22), Graphics Interface (GI'24), IEEE VL/HCC 2024, UBICOMP 2024 Posters and Demos, CSCW 2024 Posters, CHI 2025 Papers	2022–2024
Doctoral Colloquium, UbiComp / ISWC 2024, Melbourne, Australia	October 2024
Lab Meeting Coordinator, Simon Fraser University	May 2020 – May 2021
Coordinator, National Service Scheme (NSS), PEC University of Technology	May 2014 – May 2018

STUDENT MENTORING

Parsa Alamzadeh, Simon Fraser University	Jan 2021– Aug 2021
Supreet Singh Dhillon, Simon Fraser University	May 2024 – Aug 2024
Gavin Nagra, Simon Fraser University	May 2024 – Aug 2024
Isabelle Kwan, Simon Fraser University	May 2024 – Aug 2024
Layan Barrieshee, Simon Fraser University	Sept 2024 – Dec 2024
Harpreet Kaur Dubb, Simon Fraser University	Sept 2024 – Dec 2024
Ujjwal Maken, Simon Fraser University	Sept 2024 – Dec 2024
Dandan Sang, Simon Fraser University	Sept 2024 – Dec 2024