Nimisha Karnatak

Ph.D. in Computer Science at University of Oxford

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RESEARCH INTERESTS

Human-Computer Interaction, Human-AI Interaction, Healthcare, Accessibility, ICTD

EDUCATION

- **University of Oxford, United Kingdom** — Oct 2023 - Present
  Doctor of Philosophy in Computer Science
  - Supervisors: Professor Sir Nigel Shadbolt and Professor Max Van Kleek
  - Research Focus: Investigating the inclusive development of Gen-AI based systems for novice tech users in high-stakes settings, using community healthcare workers in the Global South as a representative case study
- **International Institute of Information Technology, Bangalore** — July 2019 - June 2021
  Master of Science in Digital Society, Specialization: Data Intensive Digital Design — *CGPA: 3.72/4.0*
  - Dean's Merit List of IIIT-B (For outstanding academic performance)
- **G.B. Pant University of Agriculture & Technology, Pantnagar** — Sept 2014 - June 2018
  Bachelor of Technology in Industrial and Production Engineering — *CGPA: 8.093/10.0*
  - Vice Chancellor's Silver Medalist of the batch 2014 - 18 (awarded to the highest CGPA holder)
  - Toppers merit scholarship throughout the B.Tech. programme

WORK EXPERIENCE

- **Google DeepMind London** — London, United Kingdom
  Student Researcher — *April 2024 - Oct 2024*
  - **Project**: Exploring the use of generative AI in co-creation tasks, focusing on multimodal interaction
    * Led the project under a non-disclosure agreement (NDA), including study design, participant recruitment, data collection, and qualitative analysis.
    * First author paper under preparation
  - ★ *Note: Submitted U.S. patent application for the AI prototype*
- **Microsoft Research India** — Bangalore, India
  *Research Fellow (**Full-Time Position**)* — *July 2021 - May 2023*
  - **Collaborators**: Dr. Bill Thies, Dr. Mohit Jain, Dr. Indrani Medhi Thies, Brooke Loughrin, Odeline Mateu
  - **Project 1**: Understanding the ecosystem of BP management in low-resource communities of India, joint research project with Microsoft Health Futures at **Microsoft Research, Redmond**
    * Recruited 21 patients clinically diagnosed with hypertension or hypotension; conducted and analyzed 21 qualitative interviews
    * Design recommendations for chronic disease management in resource-constrained settings in India
    * First-author paper accepted in the ACM TOCHI journal, presented at **ACM CHI 2024** [2]
  - **Project 2**: Understanding the technology-mediated interaction of phlebotomists in India
    * Identified and recruited stakeholders of the phlebotomists' ecosystem; conducted and analyzed 26 qualitative interviews and 3 observation studies
    * Proposed design recommendations to improve transparency, trustworthiness, and confidentiality in the phlebotomy ecosystem.
    * First-author paper accepted in CSCW 2024 [3]

PUBLICATIONS

[1] **Generative AI as Collaborative Technology for ASHA Workers in Marginalized Communities**
Nimisha Karnatak, Max Van Kleek, Nigel Shadbolt.
Accepted workshop paper at the Collaborative AI and Modeling of Humans Bridge at the Association for the Advancement of Artificial Intelligence (AAAI 2024) Conference (Preprint)

[2] **"Is it even giving the correct reading or not?": How Trust and Relationships Mediate Blood Pressure Management in India**
Nimisha Karnatak, Brooke Loughrin, Tiffany Amy Kuo, Odeline Mateu-Silvernail, Indrani Medhi Thies, Bill Thies, and Mohit Jain
Accepted paper at the Transactions on Human-Computer Interactions (ACM TOCHI).
★ *Note: Presented at the ACM conference on Human Factors in Computing Systems (ACM CHI 2024).*(Paper)

[3] **Understanding the Technology-Mediated Home Phlebotomy Ecosystem in India**
Nimisha Karnatak*, Meghna Gupta* and Mohit Jain (* denotes equal authorship)
Accepted paper at the ACM Conference On Computer-Supported Cooperative Work And Social Computing (CSCW 2024) Conference (Paper)

Invited Talks

- **Google DeepMind, London, August 2024**: Bridging the Expertise Gap: Understanding the Dynamics of Co-Creation between LLM-powered Tools and Novice Designers
- **UXR Health Collectives, Microsoft Research Redmond, August 2023**: Designing for Trust: UX Strategies in Blood Pressure Management for Low-Resource Indian Communities
- **Technology and Empowerment Group, Microsoft Research India, April 2022**: Understanding the Ecosystem of Blood Pressure Management in Low Resource Communities of India

Achievements

- Nominated by the University of Oxford for the **Google PhD Fellowship** through a competitive, university-wide selection process. (Link)
- Nominated by the University of Oxford for the **Apple Scholars in AI/ML PhD Fellowship** through a competitive, university-wide selection process. (Link)
- Awarded $1,500 scholarship to present my work titled "Generative AI as Collaborative Technology for ASHA Workers in Marginalized Communities." at the 38th AAAI Conference on Artificial Intelligence in person
- Selected for the SIGCHI Emerging Scholars at CSCW 2023 and awarded $1,000 in financial support.
- Amongst the top 65 students out of over 15000 applicants across India to get selected as a **SPARK summer Intern for 2020** at the Indian Institute of Technology, Roorkee (**IIT-R**)
- Won the **'Best Presentation Award'** for my internship work at the SPARK Internship Program of the Indian Institute Of Technology, Roorkee (**IIT-R**) Certificate Of Appreciation by IIT-R and SPARK

Funded Academic Research

- **Indian Institute of Technology Roorkee** Roorkee, India
  User Experience Research Intern *June 2020 - July 2020*
  - **Project**: Evaluation of urban space from the perception of the elderly to build an **inclusive** neighborhood
  - **Advisor**: Prof. Saptarshi Kolay (IIT-Roorkee)
  - **Responsibilities**: Created personas and scenarios; designed survey for the user study containing a total of 65 questions, analyzed the qualitative and quantitative data to design ideas for the active aging of the elderly

- **International Labour Organisation (ILO)** Geneva, Switzerland
  Qualitative Research Assistant *Sep 2019 - June 2020*
  - **Project**: Exploring the experiences of women working in the AI domain in India and understanding the ethical aspects of AI from the perspective of women.
  - **Advisors**: Dr. Uma Rani (Senior Economist, ILO), Prof. Preeti Mudliar (IIIT-B)
  - **Responsibilities**: Recruited Indian female AI engineers as participants using LinkedIn and snowball sampling; designed questionnaire, conducted 24 qualitative interviews averaging 120 min

- **Digital Identity Research Initiative at Indian School Of Business and IIIT-B** Bangalore, India
  Research Intern *Jan 2020 - June 2020*
  - **Project**: Exploring the implication of Aadhar failure and consequential exclusion.
  - **Advisor**: Prof. Bidisha Chaudhuri (IIIT-B)
  - **Responsibilities**: Performed statistical analysis and created infographics for a qualitative study in South India using MS Excel; documented literature on biases in biometric technology and Aadhaar

Academic & Community Services

- **Graduate Teaching Assistant** Fall 2024
  Interaction Design (IDE), University of Oxford
- **External Reviewer** 2024 - Present
  ACM CHI Conference on Human Factors in Computing Systems (ACM CHI)

Academic Projects

- **Few-Shot Classification of Medical Data**: Exploring Self-Supervised Learning Approaches for Classifying Low Resource Medical Data: A Comparative Investigation With MedMNIST
  - Used a hybrid approach leveraging self-supervised learning and active learning to perform few-shot image claasification of medical data; Technology Stack: Python, PyTorch, Numpy, Matplotlib

- **Brain MRI Segmentation**: Developed a deep-learning network for semantic segmentation of brain MRI scans.
  - Trained a UNet-based architecture using Dice loss as objective function to perform brain MRI segmentation; Technology Stack: Python, PyTorch, Numpy, Matplotlib

- **User Research to Design Accessible Mobile Payment Apps for the Visually Challenged:**: Developed low-fidelity prototype (Braille inscribed on cardboard simulating mobile phone screens) and high-fidelity prototype (by deploying Adobe XD) using design concepts from user research for usability testing

- ○ Research methodology: qualitative interviews of 30-40 minutes with 11 visually challenged participants
- ○ Usability Testing methods: Think out loud and Participant observation followed by an interview
- **Virtual internship in Product Management**: Performed strategic evaluation of the Microsoft product 'Workplace Analytics' on the grounds of software product management and proposed design recommendations under the supervision of Professor Haragopal Mangipudi, Infosys veteran & Finacle creator
- **Developed high-fidelity virtual classroom prototype using Adobe XD**: Analyzed the impact of emergency remote learning on IIIT-B students during COVID-19 through quantitative and qualitative research.
- **Spatial Data Analysis of Bangalore's Land Use and Cover**: Conducted a Time Series Analysis on Bangalore's Land Use and Land Cover using GRASS GIS software for the years 2003, 2010, 2015, and 2020.
- **Bachelor of Technology Final Year Thesis Project**: Analyzed and compared the temperature and humidity variation between the Earth Energy Enabled Cooling System and Traditional Cooler.

Relevant Coursework

- **Doctor of Philosophy**: Deep Learning in Healthcare
- **Master of Science**: Human-Computer Interaction; Quantitative and Qualitative Research; Web and the Mind; Software Product Management; Algorithms; Social Complexity and Systems Thinking; ICT Policy and Regulation; Technology and Society; Geographic Information System
- **Bachelor of Technology**: Work System Design; Automation and Robotics; Probability, Statistics, and Queuing Models; Industrial Engineering; Engineering Mathematics; Numerical Methods for Engineering

Skills / Technologies

- **Human Computer Interaction**: User Study, Focus Groups, Prototyping, Wireframing, Adobe XD, Usability Testing and Evaluation, Design Thinking, Accessible and Inclusive design, Personas, Scenarios, Storyboards, Diary study, Survey Design and Sampling, Stakeholder/user interviews
- **Research and Data Analysis Skills**: Qualitative Research & Quantitative Research, Data Collection & Analysis, Participant Observation, Ethnographic Research, Microsoft Excel, Advanced Statistics
- **Technical Skills**: Python (NumPy), PyTorch, Machine Learning, Deep Learning (Convolutional Neural Networks and Artificial Neural Networks)

Positions of Responsibility

- **NGO: Jivaamrit Khelpur Shermou Roorkee (2018-19)**: Volunteered for organic farming awareness among farmers.
- **Indian Red Cross Society (since 2015)**: Life member of Red Cross Society since 2015, Volunteered in organizing 5 blood donation & 4 health check-up camps.
- **National Service Scheme by Ministry of Youth Affairs & Sports, Government Of India (2014-2017)**: Awarded B&C certification for completing 240 & 360 hours of volunteering in 2014-2016 and 2016-2017

Extracurricular Activities

- Selected for the University of Oxford's SeedWISE Programme, an exclusive initiative empowering women in STEM to develop entrepreneurial skills (Certificate)
- Created an Instagram page to create awareness for eating healthy with over 26000 followers indian_weightloss_recipies
- Selected in Global Leadership Experience Program 2019 organized by Common Purpose in collaboration with King's College London and IIIT-B
- Winner of Netritva: Leadership Hunt contest 2016, organized by YUVA, The National Youth Awakening Festival.