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** October 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 LLM-based systems for novice tech users in high-stakes settings, using community healthcare workers in the Global South as a representative case study
  - Coursework: Deep Learning in Healthcare
- **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-present*
  - **Project**: Research currently under a non-disclosure agreement
- **Microsoft Research India** Bangalore, India
  Research Fellow *July 2021 - May 2023*
  - **Project 1**: Understanding the ecosystem of BP management in low-resource communities of India
    Advisors: Dr. Bill Thies, Dr. Mohit Jain, Dr. Indrani Medhi Thies
    - Recruited 21 patients clinically diagnosed with hypertension or hypotension; conducted and analyzed 21 qualitative interviews.
    - Proposed design recommendations to inform the future of chronic disease management in resource-constrained settings in India
    - First-author paper accepted in the ACM TOCHI journal, presented at **ACM CHI 2024**
  - **Project 2**: Understanding the technology-mediated interaction of phlebotomists in India
    Advisor: Dr. Mohit Jain
    - Identified and recruited stakeholders of the phlebotomists' ecosystem; conducted and analyzed 26 qualitative interviews and 3 observation studies
    - Proposed design recommendations to improve the transparency, trustworthiness, and confidentiality within the phlebotomy ecosystem
    - First-author paper accepted in CSCW 2024
- **Alpine College Of Management and Technology** Dehradun, India
  Teaching Faculty *July 2018 - July 2019*
  - Worked as a Teaching faculty in the mechanical engineering department

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 and 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, International Labour Organisation), Prof. Preeti Mudliar (IIIT-B)
  - **Responsibilities**: Recruited Indian female AI engineers as participants using LinkedIn and snowball sampling; designed questionnaire and conducted 24 qualitative interviews with average interview length of 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 generated info-graphics of the qualitative study conducted in South India using MS Excel; documented literature highlighting the biases of biometric technology and Aadhar

Publications

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

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

[3] **"Is it even giving the correct reading or not?": How Trust and Relationships Mediate Chronic Disease 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: Selected for presentation at the ACM conference on Human Factors in Computing Systems (ACM CHI 2024).* (Paper)

Achievements

- 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

Academic Projects

- **Brain MRI Segmentation**: Developed a deep-learning based 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 make mobile payment applications accessible 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 using Zoom
  - 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 and Mr. Nishant Rajan, Product Manager at Microsoft.
- **High-fidelity prototype of a virtual classroom application using Adobe XD**: Analysed the impact of emergency remote learning during COVID-19 among students of IIIT-B using data collected via 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

- **Master of Science**: Human-Computer Interaction; Quantitative Research and Qualitative Research; Web and the Mind; Software Product Management; Algorithms; Social Complexity and Systems Thinking; ICT Policy and Regulation; Technology and Society; Application Development for a Connected 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.