

Shivani Kapania

Pre-Doctoral Researcher, Google Research

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Education

June 2019	Guru Gobind Singh Indraprastha University	9.31/10 (Rank 1)
Aug 2015	Bachelor of Technology in Computer Science	

Research Experience

Present	Google Research Responsible AI & Human-Centered Technology	Bangalore, India
April 2021	Pre-Doctoral Researcher Advisors: Dr. Nithya Sambasivan , Dr. Ding Wang , Dr. Alex Taylor Examining and designing safer, more responsible AI for non-Western communities using theories and methods from HCI– focused on calibrating user trust and designing better ML data processes.	
May 2020	HCI Researcher (contract via Optimum Infosystems) Advisor: Dr. Nithya Sambasivan We identified Data Cascades as downstream impacts of data practices in high-stakes AI. (Best Paper, CHI 2021)	
Mar 2020	IIIT Delhi Melange Lab, Computer Science & Engineering	Delhi, India
Jul 2019	Research Associate Advisor: Prof. Pushpendra Singh Investigated the design and development of mobile applications for low-literacy users and created a framework with 13 actionable recommendations for interface design. Examined the practices of menstrual health management during transit.	
Aug 2018	IIT Hyderabad Regenerative Medicine and Stem Cell Lab	Hyderabad, India
Jun 2018	Research Intern Advisor: Prof. Subha Narayan Rath Developed an approach to successfully differentiate between live and dead cells, generating a tally and finding their distribution within an image. The dataset used for our analysis was curated at the RMS lab and consisted of L929 and A549 lung cancer cells.	

Selected Publications

C=Conference, W=Workshop

- [C.3] "Because AI is 100% right and safe": User Attitudes and Sources of AI Authority in India [🔗]
[Shivani Kapania](#), Oliver Siy, Gabe Clapper, Azhagu Meena, Nithya Sambasivan
ACM CHI Conference on Human Factors in Computing Systems [CHI'22]
- [C.2] "Everyone wants to do the model work, not the data work": Data Cascades in High-Stakes AI [🔗]
[Nithya Sambasivan](#), [Shivani Kapania](#), Hannah Highfill, Diana Akrong, Praveen Paritosh, Lora Aroyo
ACM CHI Conference on Human Factors in Computing Systems [CHI'21]
- [C.1] Actionable UI Design Guidelines for Smartphone Applications Inclusive of Low-Literate Users [🔗]
[Ayushi Srivastava](#)*, [Shivani Kapania](#)*, [Anupriya Tuli](#)*, [Pushpendra Singh](#) (* = Equal Contribution)
ACM Conference On Computer-Supported Cooperative Work And Social Computing [CSCW'21]
- [W.2] Multi Object Tracking with UAVs using Deep SORT and YOLOv3 RetinaNet Detection Framework [🔗]
[Shivani Kapania](#), Dharmendar Saini, Sachin Goyal, Narina Thakur, Rachna Jain, Preeti Nagrath
ACM Workshop on Autonomous and Intelligent Mobile Systems [ACM AIMS'20]
- [W.1] Data Desiderata: Reliability and Fidelity in High-stakes AI [🔗]
[Shivani Kapania](#), [Nithya Sambasivan](#), [Kristen Olson](#), [Hannah Highfill](#), [Diana Akrong](#), [Praveen Paritosh](#), [Lora Aroyo](#)
Data Excellence Workshop At the AAAI Conference on Human Computation and Crowdsourcing [DEW'20]

Research Projects

Ongoing workstreams

Human-Data Interaction

May'20 - Present

Advisors: [Dr. Nithya Sambasivan](#), [Dr. Ding Wang](#), [Dr. Alex Taylor](#)

- > Conducted foundational research on data practices and challenges among 61 ML practitioners and researchers—focusing on high stakes domains in AI, where data are less abundant and niche. [🌐] [Best Paper@CHI'21]
- > Conducting exploratory mixed-methods research to examine the practices surrounding selection of data annotators and operationalization of annotator diversity in data production for ML projects. [In Submission]
- > Collaborating with the Health team to apply our research for producing a food images dataset, defining dataset representativeness, and re-imagining nutritional metrics for meal logging applications.
- > Contributed to the Data Collection + Evaluation chapter for the updated PAIR Guidebook v2 launched at Google I/O 2021, backed by actionable insights from our research. [🌐]
- > Conducted a systematic literature review on human computation which resulted in a task instruction template and a task usability questionnaire, used widely across teams at Google.
- > Coverage/Mentions - Data Cascades: [NeurIPS Datasets Track'21](#), [State of AI Report](#), [O'Reilly Data and AI](#), [Gradient Flow](#), [Venture Beat](#), [Scroll.in](#), [ZDNet](#), [Hacker News](#), [Analytics India Mag](#), [Tamr Blog](#), [Data Science Weekly](#), [Data Engineering Weekly](#) and more.

Contextualizing Human-AI Interaction and Calibrating Trust

Feb'21 - Present

Advisors: [Dr. Nithya Sambasivan](#), [Dr. Alex Taylor](#)

- > Led foundational mixed-methods HCI research with technology users in India on understanding the perceptions of AI-based outcomes, and the contextual socio-cultural factors which contribute to these attitudes. [🌐] [CHI'22]
- > Examined the practices and experiences of sanitation and domestic workers with the datafication process in three applications that impact their lives—workplace monitoring, credit-rating systems, and public welfare delivery. [🌐] [ICTD'22]
- > Conducting research on supporting a critical interpretation of algorithmic outcomes, facilitating user awareness of problematic algorithmic behaviors and AI literacy, particularly with technology users with high trust in AI.

Select Prior Projects

Design of User Interfaces for Low-literacy Users

Sept'19 - March'20

Advisor: [Prof. Pushpendra Singh](#)

- > Created an actionable framework towards designing inclusive mobile applications for low-literacy users through a systematic literature review and evaluation. [🌐] [CSCW'21]
- > Investigated the role of a translational resources for practitioners creating applications for users with mixed-literacies. [🌐]

Futu(RE): Wind and Solar Energy Prediction

March'19

Advisor: [Prof. Abhishek Gandhar](#)

- > Developed a mobile application and website to guide grid operators for optimal load management by predicting solar and wind energy generation day ahead as well as during grid operation on an hourly basis.
- > The combined method to forecast wind and solar power uses gradient boosted decision trees with different models for hourly forecast and day ahead prediction. [Winner@Smart India Hackathon 2019]

Multi-object Tracking

Jan'19 - June'19

Advisors: [Prof. Rachna Jain](#), [Prof. Narina Thakur](#), [Prof. Dharmendar Saini](#)

- > Developed an approach for online real-time tracking that can recover trajectories of objects in video captured by an unmanned aerial vehicle on the VisDrone'18 dataset. [🔗] [ACM AIMS'20]
- > We used a combination of two object detection algorithms and applied NMS to circumvent the challenges posed by the small size of objects in videos captured from a significant height.

Other Experience

Oct 2019 Jun 2019	Upgrad University Teaching <i>Data Science Instructor</i> Taught Data Science and ML using Python to undergraduate students in live online sessions of 50+ students. Guided them in gaining hands-on experience and implementing ML models from scratch.	Remote
Dec 2018 Oct 2018	Public Lab Plots <i>Google Code In Mentor 2017 Mentor: Jeffrey Warren</i> Created and evaluated tasks for the students and worked with the Public Lab community to facilitate review of student work in the plots2 project, teaching students how to use Public Lab's version control.	Remote
Jul 2018 May 2018	Tata Consultancy Services Digital & Enterprise Transformation <i>Software Developer Intern Mentor: Vaibhav Srivastav</i> Created a system using LSTM networks capable of generating midi music files that make use of a classical Piano given a sequence of music notes.	Remote


Skills

Research Methods	<i>Data collection:</i> Interviews, Surveys, Focus Groups <i>Analysis:</i> Reflexive Thematic Analysis, Grounded Theory Analysis
Languages	<i>Proficient:</i> Python, C, C++ <i>Familiar:</i> Java, R, MATLAB, HTML, JavaScript
Tools	SPSS, Figma, NVivo

Community Contributions

Reviewing	CHI'23, DIS'22, CSCW'22 (<i>highly useful</i>), CHI'22 (<i>special recognition</i>), CHI'22 alt.chi, CHI'22 LBW, CSCW'21, CHI'21, Patterns'21
Fairness testing	Participated in an internal program to identify fairness, harms, and human rights related concerns, while stress testing highly sensitive products.
PAIR Workshops	Facilitated three PAIR Guidebook workshops for the Google for Startups Accelerator orgs in APAC and EMEA and 91springboard.
Code-in-Place, Stanford	Prepared and taught a weekly discussion section of 10-12 students to supplement professors' lectures in a 5-week introductory online Python programming course
Tutoring, Aashmaan	Tutored mathematics and science to opportunity-deprived children (between the ages 11-15) on weekends.
Community Volunteer, NSS	Led and organised blood donation drives and Swachh Bharat activities with National Service Scheme (NSS) between 2016-18.

Leadership and Extra-curriculars

- MIT India Initiative** *Participant*  2020
- › Created *Laari*, a full-size prototype for a modular and solar-powered street food cart, as an effort towards improving the hygiene and sanitation conditions in street food in India.
 - › Selected in the Top 300 students from India to participate in "The Design, Technology, and Social Innovation Workshop" under the track title, Community based Healthcare Services.
- Annual Technical Fest, BVCOE, Delhi** *Fest Manager* 2017
- › Responsibilities included overseeing the smooth execution of all events, hosting the inauguration ceremony and more.
- ACM Student Chapter, BVCOE** *Technical Executive* 2016 - 2017
- › Responsibilities included organised tech tutorials, quizzes for freshmen students.
- Zaahir, theatre society of BVCOE** *Member* 2015 - 2016
- › Organized and performed in street plays to spread awareness about socio-cultural issues as a part of Zaahir—the theatre society of BVCOE (twice winners).
- Training and Placement Cell, BVCOE** *T&P Coordinator* 2018 - 2019
- › Executed placement activities, coordinated between the T&P Cell and my batchmates by relaying information about upcoming placements, internship opportunities and seminars.
- Panchtatva, DPS RK Puram** *Cultural Lead* 2015
- › Organized events to spread awareness about environmental issues among students and set up initiatives to mitigate on an intra-school level.