

Manaswi Saha

PhD Candidate | Paul G. Allen School of Computer Science & Engineering | University of Washington

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Overview

A computer scientist conducting *interdisciplinary research across high impact problem domains* such as health, accessibility, and sustainability • Using *AI, human-centered design processes, and large-scale real-world deployments* to build better interactive systems that enrich people's interactions with data, tools, and the world

Research Areas: HCI • urban informatics • data visualization • ubiquitous computing • accessibility • sustainability
Skills:

Research Dev: system building | large-scale deployments | design space development

Programming: Python, JavaScript, HTML/CSS, C, C++, Java, Shell Scripting | mapbox, d3, kepler.gl | Play, Django

Data Analysis and Applied ML: Python - pandas, numpy, matplotlib, sklearn

Other Tools: Github, Tableau, Amazon Mechanical Turk, Prolific | MS Office, Google Suite, Latex

User Research: thematic analysis, semi-structured interviews, surveys, affinity diagramming, stakeholder analysis

Accomplishments and Real-World Impact:

- Engineered **Project Sidewalk**, a tool deployed in **10 cities around the world**; used by **11 000+ users**; generated datasets with **700,000+ data points**
- Research recognized by media, notably in **New York Times, NPR**, and local TV news in Seattle and DC
- **Invited speaker** across academic institutions, tech industry, government conferences, and local meetups

Education

University of Washington

Seattle, USA

PhD in Computer Science & Engg. | MS in Computer Science & Engg.

Sep 2017 - Aug 2022 (expected)

Advisor: Jon Froehlich • 2019 Amazon Catalyst Award \$10K • Google PhD Fellowship 2020 - 2022

University of Maryland

College Park, USA

PhD in Computer Science - *transferred to University of Washington*

Aug 2015 - Sep 2017

Advisor: Jon Froehlich • Dean's Fellowship 2015 - 2017

Vellore Institute of Technology University

Vellore, India

Master of Computer Applications (MCA)

Jul 2009 - May 2012

University of Mumbai

Mumbai, India

Bachelor of Science - Information Technology (BSc IT)

Jun 2006 - Apr 2009

Industry Experience

Autodesk Research • Research Intern • HCI/VIS: User Interface Research Group

Toronto, Canada

Mentor: Justin Matejka

Jun 2020 - Oct 2020

Studied people's estimation skills for metrics (e.g., cost, power, carbon footprint) for insights on effective communication of sustainability data • Built a HTML/CSS/JS web app for an online study with 50+ sustainability experts and novices • Paper: In-prep

Microsoft Research • Research Intern • Ability and Enable Groups

Redmond, USA

Mentors: Meredith R. Morris, Ed Cutrell, Alex Fiannaca

Jun 2018 - Sep 2018

Engineered Landmark AI, a mobile app prototype using 3D-audio and computer vision algorithms for addressing the last-feet challenge in GPS systems • Conducted a design-probe study to understand and address wayfinding challenges using GPS tools for visually impaired users • Ran a survey and an interview study with 12 participants to create the design space for AI-based navigation tools • Paper(s): P.3

Adobe Research • Research Intern • Big Data Experience Lab

San Jose, USA

Mentors: Tom Jacobs and David Tompkins

May 2016 - Aug 2016

Created an ecosystem design and built prototype for Bluetooth beacon-based personalized information delivery system for digital marketing that bridges the online world with the physical (brick and mortar stores) • PA.1 - Patent as the lead

Academic Research Experience

University of Washington • Graduate Assistant • Makeability Lab

Seattle, USA

Advisor: Jon Froehlich • Collaborator: Jeffrey Heer

Sep 2017 - Aug 2022

RESEARCH

- Led 4–10-person design, engineering, and research teams over 6 years
- Lead engineer and researcher for making the physical and software infrastructure accessible to everyone
- Wrote 15.5K lines of code for HTML/CSS/JS frontend and Java/Scala/PostgreSQL backend
- Engineered tools and prototypes for collecting and mapping accessibility data at scale; used Google Street View, crowdsourcing, gamification, interactive geovisualizations, AI, and human-centered design techniques
- Designed and executed interview studies with 35+ participants to understand multi-stakeholder data-driven decision-making needs and sensemaking practices around *urban accessibility*; stakeholders included policymakers, disability advocates, government officials, people with mobility disabilities, and caregivers
- Evaluated tools using lab studies, public deployments in cities, and user interviews with varied stakeholders
- Paper(s): P.2, P.4, P.5, and others in CHI, CSCW, and ASSETS

TEACHING • For courses on Intro. to Machine Learning, Software Design to Empower Underserved Populations, Crowdsourcing, Citizen Science, and Large-scale Online Experimentation, The Future of Access Technologies, Intro to HCI, and Advanced HCI

University of Maryland • Graduate Assistant • Makeability Lab

College Park, USA

Advisor: Jon Froehlich

Aug 2015 - Aug 2017

RESEARCH • Explored the use of thermal cameras mounted on smartphones by novices (e.g., DIY enthusiasts) to conduct thermography in homes • Analyzed interviews for a 4-week field study with 10 participants • Published in CHI 2016 and 2017

TEACHING • For CS undergrad Object-Oriented Programming I and II courses

IIIT-Delhi • Research Associate • Mobile and Ubiquitous Computing Lab

Delhi, India

Advisor: Amarjeet Singh • Collaborators: Anind Dey (UW), Yuvraj Agarwal (CMU), Pushpendra

Nov 2012 - Jul 2015

Singh (IIIT-Delhi)

- Led engineering for SensorAct, a building Java/MongoDb-based middleware to control and operate hardware sensor modules, mounted with ambient environmental sensors, through an online interface for building managers and occupants
- Engineered EnergyLens+, a real-time energy apportionment and feedback system for smart living spaces that interfaced with smartphone sensors and smart meters for inferring and apportioning personal energy consuming activities to individuals
- Engineered the end-to-end system using Python/Django/MySQL server and designed an Android app for visualizing feedback
- Evaluated the system with a small-scale deployment in single and multi-occupant homes over 2 weeks
- Paper(s): P.1 and others in ACM eEnergy, BuildSys, IEEE UIC, and NSDI

Selected Publications and Patents ([Full list](#) ⁸)

- P.5 **Visualizing Urban Accessibility: Investigating Multi-stakeholder Perspectives through a Map-based Design Probe Study** • CHI 2022
M. Saha, S. Patil, E. Cho, E. Y. Cheng, C. Horng, D. Chauhan, R. Kangas, R. McGovern, A. Li, J. Heer, and J. E. Froehlich
- P.4 **Urban Accessibility as a Socio-Political Problem: A Multi-Stakeholder Analysis** • CSCW 2020
M. Saha, D. Chauhan, S. Patil, R. Kangas, J. Heer, and J. E. Froehlich
- P.3 **Closing the Gap: Designing for the Last-Few-Meters Wayfinding Problem for People with Visual Impairments** • ASSETS 2019
M. Saha, A. J. Fiannaca, M. Kneisel, E. Cutrell, M. R. Morris
- P.2 **Project Sidewalk: A Web-based Crowdsourcing Tool for Collecting Sidewalk Accessibility Data at Scale** • CHI 2019 • **Best Paper Award (Top 1%)**
 **M. Saha**, M. Saugstad, H. Maddali, A. Zeng, R. Holland, S. Bower, A. Dash, S. Chen, A. Li, K. Hara, J. Froehlich
- P.1 **EnergyLens: Combining Smartphones with Electricity Meter for Accurate Activity Detection and User Annotation** • e-Energy 2014
M. Saha, S. Thakur, A. Singh, Y. Agarwal
- PA.1 **Digital Content Output Control in a Physical Environment Based on a User Profile** • Adobe Research • Filed Feb 2017 • Patent Pending
M. Saha, T. Jacobs, D. Tompkins, P. Franssen

For a detailed list of research experience, awards, publications, and press/media, please refer to [my website](#) and [CV](#).