Maitraye Das

maitraye.github.io
maitraye@u.northwestern.edu

Research Statement

My research interest sits broadly at the intersection of Human-Computer Interaction (HCI), Computer-Supported Cooperative Work (CSCW), and Accessible Computing, with a focus on studying and designing for accessible collaborative content production in ability-diverse teams, i.e., teams involving people with and without disabilities. Methodologically, I take a human-centered, multi-stage approach that involves qualitative studies (e.g., contextual interviews, observations, ethnography) followed by the design, development, and evaluation of new systems through exploratory and mixed-methods experimental analyses. As a first-generation scholar and woman of color from the Global South, my broader goal is to enhance accessibility and inclusion through computing and contribute towards reducing equity gaps in education, employment, and creative work.

Education

Northwestern University, Evanston, IL, USA — May 2022 (expected)
PhD in Technology and Social Behavior (Computer Science & Communication)
Dissertation: Augmenting Ability-Diverse Collaboration: Designing for Accessible Collaborative Content Creation by People with Vision Impairments
Committee: Darren Gergle (chair), Anne Marie Piper (co-chair), Marcelo Worsley, and Cynthia Bennett

Northwestern University, Evanston, IL, USA — Mar 2021
MS in Technology and Social Behavior (Computer Science & Communication)
GPA: 3.97/4.00

Bangladesh University of Engineering and Technology (BUET) — Sep 2015
BS in Computer Science and Engineering (CSE) *with Honors*
GPA: 3.85/4.00 | *Rank:* 7th in a class of 134 students, *magna cum laude*
Thesis: Protecting Genomic Privacy in Medical Tests using Distributed Storage
Advisor: Tanzima Hashem

Selected Awards, Honors, & Grants

- Graduate Research Grant ($2,999) — 2021–2022
  School of Communication, Northwestern University
- PhD Student Research Award — 2021
  Department of Computer Science, Northwestern University
- Best Paper Nomination [C9] — 2021
  ACM Conference of Computers and Accessibility (ASSETS)
- Best Paper Honorable Mention Award [C8] — 2020
  ACM Conference on Human Factors in Computing Systems (CHI)
- Finalist (among top 20 students) — 2020
  Microsoft Research PhD Fellowship

- Best Paper Honorable Mention Award [J2] 2019
  ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW)
- Best Paper Award [C5] 2018
  IEEE International Conference on Computers, Software, and Applications (COMPSAC)
- Best Undergraduate Thesis Award 2015
  Department of Computer Science and Engg., Bangladesh University of Engineering & Technology
- Dean's List Award 2011 – 2015
  Bangladesh University of Engineering & Technology
- University Merit Scholarship 2011 - 2014
  Bangladesh University of Engineering & Technology

Journal Articles

J5. **Maitraye Das,** Anne Marie Piper, and Darren Gergle. 2021. Design and Evaluation of Accessible Collaborative Writing Techniques for People with Vision Impairments. In *ACM Transactions on Computer-Human Interaction (TOCHI)*, 42 pages. [Impact Factor: 3.15]

J4. **Maitraye Das,** John Tang, Kathryn E. Ringland, and Anne Marie Piper. 2021. Towards Accessible Remote Work: Understanding Work-from-Home Practices of Neurodivergent Professionals. In *Proceedings of the ACM on Human-Computer Interaction,* Vol. 5, CSCW1, Article 183 (April 2021), 30 pages.

J3. Katya Borgos-Rodriguez, **Maitraye Das,** and Anne Marie Piper. 2021. Melodie: A Design Inquiry into Accessible Crafting through Audio-Enhanced Weaving. In *ACM Transactions on Accessible Computing (TACCESS),* Vol. 14, 1, Article 5 (March 2021), 30 pages. [Impact Factor: 2.64]

J2. **Maitraye Das,** Darren Gergle, and Anne Marie Piper. 2019. "It doesn't win you friends": Understanding Accessibility in Collaborative Writing for People with Vision Impairments. In *Proceedings of the ACM on Human-Computer Interaction*, Vol. 3, CSCW, Article 191 (November 2019), 26 pages. [acceptance rate: 31.2%]
Best Paper Honorable Mention (Top 5% of submissions)

J1. *Nusrat Jahan Mazumder, **Maitraye Das**, Tanzima Hashem, Sharmin Afrose, and *Khandaker Ashrafi Akbar. 2019. Towards Privacy-preserving Authenticated Disease Risk Queries. In *Journal of Information Processing*, Vol. 27, (September 2019), pp. 624-642.

Peer-Reviewed Conference Proceedings Papers[1]

C10. **Maitraye Das**, *Thomas McHugh, Anne Marie Piper, and Darren Gergle. [On accessibility in collaborative writing]. *Under review (title edited to maintain anonymity).*

C9. Kelly Mack, **Maitraye Das,** Dhruv Jain, Danielle Bragg, John Tang, Andrew Begel, Erin Beneteau, Josh Urban Davis, Abraham Glasser, Joon Sung Park, and Venkatesh Potluri. 2021. Mixed Abilities and

* Directly mentored student.

[1] Top-tier venues in Human-Computer Interaction include extensively peer-reviewed conferences such as CHI. These highly selective conferences are intended for archival papers and comparable to journals in visibility, selectively, and impact. When available, the acceptance rate is included.

Varied Experiences: A Group Autoethnography of a Virtual Summer Internship. In *the 23rd International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '21),* 21 pages. **Best Paper Nomination** [acceptance rate: 29%]

C8. **Maitraye Das,** Katya Borgos-Rodriguez, and Anne Marie Piper. 2020. Weaving by Touch: A Case Analysis of Accessible Making. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20),* 1-15. [acceptance rate: 24.3%]
Best Paper Honorable Mention (Top 5% of submissions).

C7. **Maitraye Das,** Brent Hecht, and Darren Gergle. 2019. The Gendered Geography of Contributions to OpenStreetMap: Complexities in Self-Focus Bias. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19)*, Paper 563, 14 pages. [acceptance rate: 23.8%]

C6. Moushumi Sharmin, Monsur Hossain, Abir Saha, **Maitraye Das**, Margot Maxwell, and Shameem Ahmed. 2018. From Research to Practice: Informing the Design of Autism Support Smart Technology. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18),* Paper 102, 1-16. [acceptance rate: 25%]

C5. **Maitraye Das**, *Nusrat Jahan Mazumder, Sharmin Afrose, *Khandaker Ashrafi Akbar, and Tanzima Hashem. 2018. A Novel Secret Sharing Approach for Privacy-Preserving Authenticated Disease Risk Queries in Genomic Databases. In *Proceedings of the 42nd IEEE International Conference on Computers, Software, and Applications (COMPSAC '18)*, pp. 645-654. [acceptance rate: 24%]
Best Paper Award

C4. Abir Saha and **Maitraye Das**. 2017. Impact of Social Networking on Post-Partum Depression in Women: An Analysis in the context of Bangladesh. In *Proceedings of the 20th IEEE International Conference on Computer and Information Technology (ICCIT '17),* pp. 1-6.

C3. **Maitraye Das** and Abir Saha. 2017. An Automated Speech-Language Therapy Tool with Interactive Virtual Agent and Peer-to-Peer Feedback. In *Proceedings of the 4th International Conference on Advances in Electrical Engineering (ICAEE '17)*, pp. 510-515.

C2. *Fatema Khan, **Maitraye Das**, and *Ahiya Ahammed. 2016. PurpleAid: An mHealth platform to combat health hazards of women. In *Proceedings of the 2016 International Conference on Medical Engineering, Health Informatics and Technology (MediTec '16).*

C1. **Maitraye Das**, Sunandita Sarker, and Syeda Lammim Ahad. 2016. A Novel Health Support System with Biometric Data Acquisition Device. In *Proceedings of the 19th International Conference on Computer and Information Technology (ICCIT '16)*, pp. 201-206.

Workshop Position Papers, Posters, and Doctoral Consortia

W8 **Maitraye Das.** 2021. Designing for Accessible Collaborative Content Creation for People with Vision Impairments. Poster presented at the *Human Computer Interaction Consortium (HCIC '21).*

W7. **Maitraye Das.** 2020. Designing for Collaborative Content Creation for People with Vision Impairments. Presented at the *Conference Companion Publication on Computer Supported Cooperative Work & Social Computing (CSCW '20).* [Doctoral consortium]

W6. **Maitraye Das,** Katya Borgos-Rodriguez, and Anne Marie Piper. 2020. Rethinking Power and Politics in Accessible Making. Position paper accepted at *the Workshop on "Nothing About Us Without Us":*

Investigating the Role of Critical Disability Studies in HCI at the ACM Conference on Human Factors in Computing Systems (CHI '20).

W5. **Maitraye Das.** 2019. Who Can See What: Privacy and Audience Management for People with Vision Impairments on Social Media. Position paper presented at the *Workshop on Addressing the Accessibility of Social Media at the ACM Conference on Computer-Supported Cooperative Work & Social Computing (CSCW '19).*

W4. **Maitraye Das**. 2018. Understanding Collaborative Writing Practices of People with Visual Impairments. Position paper presented at *the 2018 ACM International Conference on Pervasive and Ubiquitous Computing (UbiComp '18)*, pp. 1744-1749.

W3. **Maitraye Das**. 2018. Towards Understanding the Effects of Social Networking on Postpartum Depression in Women. Poster presented at the *Grace Hopper Celebration (GHC)*, USA.

W2. **Maitraye Das**, Sharmin Afrose, and Tanzima Hashem. 2015. Protecting Genomic Privacy in Medical Tests using Distributed Storage. Poster accepted at the *Grace Hopper Celebration (GHC)*, USA.

W1. **Maitraye Das**, Sunandita Sarker, and Shahina Ferdous. 2014. SpeechAid: A Self-treatment System for Individuals with Speech Disorder. Poster presented at the *Grace Hopper Celebration India (GHCI).* **Best Technical Poster Award**

Research Experience

Northwestern University | Collaborative Technology Lab — Fall 2017 - Present
Graduate Research Assistant | advised by *Darren Gergle*

- Conducted contextual interviews and observations to understand collaborative writing practices and accessibility needs of blind professionals. Built new accessible systems to support blind writers in asynchronous and synchronous collaborative writing. Evaluated systems through a design exploration study with 15 blind writers and a mixed-methods controlled experiment with 48 blind writers.
  Faculty collaborator: *Anne Marie Piper*

- Collected a dataset of nearly 0.45 billion edits by 2000 OpenStreetMap editors using Python and Osmium. Performed quantitative analysis to investigate gender-based self-focus bias in OpenStreetMap.
  Faculty collaborator: *Brent Hecht*

Northwestern University | Inclusive Technology Lab — Spring 2018 - Present
Graduate Research Assistant | advised by *Anne Marie Piper*

- Conducted ethnographic field observations and contextual interviews at a weaving studio for people with vision impairments. Designed an audio-enhanced loom to support blind weavers in performing weaving activities and an audio-tactile system to support accessible drafting of fabric patterns.

Microsoft Research (MSR), USA | Ability Team — Summer 2020
Research Intern | mentored by *John Tang*

- Conducted semi-structured interviews with 36 neurodivergent professionals. Outlined practical guidelines for inclusive organizational practices and accessible design of remote collaboration tools.
  Faculty collaborators: *Kathryn E. Ringland, Anne Marie Piper*

- Performed a group autoethnographic study reflecting on accessible practices in an ability-diverse team and highlighted opportunities for designing technologies for accessible remote work.
  MSR collaborators: *Danielle Bragg, Andrew Begel*

Western Washington University, USA Summer 2017
Researcher (remote) | mentored by *Moushumi Sharmin* and *Shameem Ahmed*
- Performed a systematic literature review on smart technologies for children on the autism spectrum.

Bangladesh University of Engineering and Technology (BUET) Aug 2014 - Sep 2017
Undergraduate Researcher | advised by *Tanzima Hashem*
- Developed a secret-sharing algorithm for privacy-preserving disease risk queries in genomic databases.

Teaching Experience

University of Washington | Information School Fall 2020
Guest lecturer | *Input and Interaction (INFO 463)*
- Delivered talk on accessibility in collaborative writing, prepared prompts for small group discussions, and led the larger group discussion. Paper [J2] was a required reading for the class.

United International University (UIU), Dhaka, Bangladesh Oct 2015 - Mar 2017
Lecturer/Instructor | Department of Computer Science and Engineering (CSE)

- *CSE 313 – Computer Architecture*
  Delivered lectures, held weekly office hours, and designed and evaluated assignments and final exams.
  Fall 2015: 29 students

- *CSE 225 – Digital Logic Design*
  Delivered lectures, held weekly office hours, and designed and evaluated assignments and final exams.
  Fall 2015: 27 students; Summer 2016: 26 students; Fall 2016: 54 students in two classes

- *CSE 226 – Digital Logic Design Laboratory*
  Delivered lectures, conducted lab sessions, and supervised and evaluated term projects.
  Fall 2015: 77 students in three classes; Spring 2016: 29 students; Summer 2016: 49 students in two classes; Fall 2016: 40 students in two classes

- *CSE 236 – Assembly Programming Laboratory*
  Delivered lectures, conducted lab sessions, and designed and graded weekly assignments and quizzes.
  Spring 2016: 15 students; Summer 2016: 29 students

- *CSE 113 – Electrical Circuits*
  Delivered lectures, held weekly office hours, and designed and evaluated assignments and final exams.
  Spring 2016: 67 students in two classes; Summer 2016: 18 students; Fall 2016: 31 students

Course Designed

Accessible Collaboration | Northwestern University Mar 2021
Completed as one of the PhD qualifying exams | Supervised by *Darren Gergle*
- Designed the curriculum of a Computer Science/Communication upper-level undergraduate course on accessibility in collaborative work. Planned class structure, reading materials, assignments, projects, and assessments following the universal design for learning and active learning guidelines.

Mentoring Experience

- Thomas McHugh | Computer Science undergrad, Northwestern University 2020 – Present
  Coauthored paper: [C10]. Own the first place at the ACM Student Research Competition (SRC) at ASSETS 2020 and SRC Grand Finals 2021. Next position: Software engineer at Apple.

- Evan Li | Mechanical Engineering MS program, Northwestern University 2020
  Mentored on designing an audio-enhanced loom for accessible weaving.

- Rawan Mohamed | Computer Science undergrad, Northwestern University 2020
  Mentored on performing qualitative coding on user evaluation data.

- Caroline Brewley | High school student researcher 2019
  Mentored on performing a literature review and design sketching low-fidelity prototypes.

- Dana Choi | Statistics and Economics undergrad, Northwestern University 2018
  Mentored on data labeling for the OpenStreetMap gender bias project.

- Oliver Baldwin | Computer Science and Statistics undergrad, Northwestern University 2018
  Mentored on data labeling for the OpenStreetMap gender bias project.

- Nusrat Jahan Mazumder | Computer Science undergrad, Bangladesh U of Engg. & Tech 2017–18
  Coauthored papers: [J1] and [C5]. Next position: PhD student at University of Virginia.

- Khandaker Ashrafi Akbar | Computer Science undergrad, Bangladesh U of Engg. & Tech 2017–18
  Coauthored papers: [J1] and [C5]. Next position: PhD student at University of Texas at Dallas.

- Fatema Khan | Computer Science undergrad, United International University 2016
  Coauthored papers: [C2] and a poster for GHC'17. Next position: Lecturer at Prime Asia University.

- Ahiya Ahammed | Computer Science undergrad, United International University 2016
  Coauthored paper: [C2]. Next position: PhD student at University of Debrecen, Hungary.

Other Honors and Grants

Selected for EECS Rising Stars Workshop | Massachusetts Institute of Technology 2021

Special Recognition for Outstanding Review
ACM Conference on Human Factors in Computing Systems (CHI), 3 times 2021
ACM Conference on Computer-Supported Cooperative Work & Social Computing 2021, 2019

Conference Travel Grant
SIGACCESS Diversity and Inclusion Scholarship for ACM ASSETS conference 2020
Northwestern University ($2,300 + $1,500) 2019, 2018
ACM International Conference on Pervasive and Ubiquitous Computing ($600) 2018

Student Scholarship
Grace Hopper Celebration USA 2018
Grace Hopper Celebration India 2014

Best Technical Poster [W1] 2014
Grace Hopper Celebration India

Invited Talks, Panels, and Demonstrations

- Accessibility, HCI, and Aging (AHA) research group | University of Michigan — Nov 2021 (scheduled)
  Talk: Designing for ability-diverse collaboration
- Center for Research and Education on Accessible Technology and Experiences (CREATE)
  University of Washington — Oct 2021 (scheduled)
  Talk: Designing for ability-diverse collaboration
- Workshop on The Future of Care Work | ACM CSCW — Oct 2021 (scheduled)
  Discussion topic: Rethinking power and politics in care work within ability-diverse maker communities
- Microsoft Office and Windows Accessibility Teams | Microsoft — Feb 2021
  Talk: Understanding accessibility in collaborative writing for people with vision impairments
- New Future of Work Group Meeting | Microsoft — Sep 2020
  Talk: Understanding accessibility in remote work for neurodivergent professionals
- Bangladesh HCI and ICTD Study and Research Group, Virtual Event — Apr 2020
  Talk: Designing for accessible interaction
- PhD Fellowship Finalist Presentation | Microsoft Research, Redmond, WA, USA — Nov 2019
  Poster: Designing for collaborative content creation for people with vision impairments
- TSB Prospective PhD Students Visiting Weekend | Northwestern University
  Panel discussions on graduate life and research at Northwestern — 2021, 2018
  Demonstrations on accessible collaborative writing and weaving — 2019

Academic Services

Program Committee Member

Shadow PC, ACM COMPASS	2021
Grace Hopper Celebration, HCI Track	2021

Reviewer

ACM CHI [*outstanding review recognitions: 3]	2021 - 2022
ACM CSCW [*outstanding review recognitions: 2]	2019 - 2021
ACM Transactions on Accessible Computing (TACCESS)	2021
IEEE COMPSAC	2021
ACM DIS	2020
Grace Hopper Celebration	2017
Australasian Database Conference	2016

Student Volunteer

ACM CHI	2019, 2021
ACM CSCW	2019
ACM UbiComp	2018
InfoSocial Graduate Conference at Northwestern University	2018

Publicity Co-chair

InfoSocial Graduate Conference at Northwestern University	2019

Outreach & Memberships

Co-host & Co-organizer

Inspiring Stories (podcast series on Bangladeshi women in STEM)	2020 – Present

Member

Northwestern Graduate Women in Computing	2019 – Present
Association for Computing Machinery (ACM)	2017 – Present
Special Interest Group on Computer-Human Interaction (SIGCHI)	2017 – Present
Special Interest Group on Accessible Computing (SIGACCESS)	2017 – Present
Bangladeshi Women in Computer Science and Engineering	2015 – Present

Code Coach Volunteer

BraveCamp Chicago (non-profit coding camp for high school girls)	Summer 2018

Vice-President

Murchhona: BUET (cultural club)	2014 – 2015

References

Darren Gergle
John G. Searle Professor
Department of Communication Studies and Department of Computer Science (by courtesy)
Northwestern University.
Email: dgergle@northwestern.edu

Anne Marie Piper
Associate Professor
Department of Informatics
University of California, Irvine.
Email: ampiper@uci.edu

Brent Hecht
Associate Professor
Department of Computer Science and School of Communication
Northwestern University.
Email: bhectht@northwestern.edu

Kathryn E. Ringland
Assistant Professor
Department of Computational Media
University of California, Santa Cruz
Email: kringlan@ucsc.edu