Maitraye Das

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Research Statement

My research interest sits broadly at the intersection of Human-Computer Interaction (HCI), Computer-Supported Cooperative Work (CSCW), and Accessibility. Specifically, my doctoral research involves studying and designing for accessible collaborative content production in ability-diverse teams. I draw on literature in HCI, CSCW, and Disability Studies to uncover how accessibility is created, negotiated, and sustained in collaborative work. Methodologically, I take a human-centered, multi-stage approach that includes qualitative studies (e.g., contextual inquiry, ethnography) as well as system development and evaluation through exploratory and mixed-method 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
PhD in Technology and Social Behavior (Computer Science & Communication)   May 2022 (expected)
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
MS in Technology and Social Behavior (Computer Science & Communication)   Mar 2021
GPA: 3.97 out of 4.00

Bangladesh University of Engineering and Technology (BUET)   Bangladesh
BS in Computer Science and Engineering (CSE) *with Honors*   Sep 2015
GPA: 3.85 out of 4.00 (equivalent to *magna cum laude*, top 6% of the graduating class)

Research Experience

Collaborative Technology Lab | Northwestern University   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. Developed auditory representations of asynchronous collaborative features and evaluated these representations through a mixed-method controlled experimental study with 48 blind writers. Built and evaluated a Google Docs extension to enhance accessibility in synchronous collaborative writing for 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*

Inclusive Technology Lab | Northwestern University   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 auditory augmentations on a loom to enhance collaborative weaving among blind weavers and their sighted instructors. Currently developing an audio-tactile system to augment collaborative designing of fabric patterns for blind weavers.

Ability Team | Microsoft Research (MSR), USA   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 collaborator: *Danielle Bragg*

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-preserved and authenticated queries in genomic databases to compute disease susceptibility.

Awards, Honors, & Grants

EECS Rising Stars Participant	Organized by Massachusetts Institute of Technology	2021
PhD Student Research Award	Dept of CS, Northwestern University	2021
Graduate Research Grant	Northwestern University ($2,999)	2021
Best Paper Nomination	ACM ASSETS [C9]	2021
Special Recognition for Outstanding Review	ACM CHI (3 times)	2021
Special Recognition for Outstanding Review	ACM CSCW (2 times)	2021, 2019
Finalist (top 20)	Microsoft Research PhD Fellowship	2020
Best Paper Honorable Mention Award	ACM CHI [C8]	2020
Best Paper Honorable Mention Award	ACM CSCW [J2]	2019
Conference Travel Grant	Northwestern University ($2,300 + $1,500)	2019, 2018
Best Paper Award	IEEE COMPSAC [C5]	2018
Student Travel Grant	ACM UbiComp ($600)	2018
Student Scholarship	Grace Hopper Celebration, USA	2018
Best Undergraduate Thesis Award	CSE, Bangladesh University of Engineering & Technology	2015
Best Technical Poster	Grace Hopper Celebration India [W1]	2014
Student Scholarship	Grace Hopper Celebration India	2014
Dean's List Award	Bangladesh University of Engineering & Technology	2011 - 2015
University Merit Scholarship	Bangladesh University of Engineering & Technology	2011 - 2014

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. DOI: 10.1145/3480169 [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. DOI: 10.1145/3449282

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. DOI: 10.1145/3444699 [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. DOI: 10.1145/3359293 [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. DOI: 10.2197/ipsjjip.27.624

Conference Proceedings Papers[1]

C10. **Maitraye Das**, Thomas McHugh, Anne Marie Piper, and Darren Gergle. [On accessible collaborative writing]. *Under review (the title is 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 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. DOI: 10.1145/3441852.34711991 [acceptance rate: 29%] ***Best Paper Nomination**

⚥ 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. DOI: 10.1145/3313831.3376477 [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. DOI:10.1145/3290605.3300793 [acceptance rate: 23.8%]

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[1] Top-tier venues in Human-Computer Interaction include extensively peer-reviewed conferences such as CHI and CSCW. Since 2018, CSCW transitioned to a hybrid journal structure. These highly selective conferences are intended for archival papers and are comparable to journals in visibility, selectively, and impact. When available, the acceptance rate is included.

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. DOI: <u>10.1145/3173574.3173676</u> [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%] DOI: <u>10.1109/COMPSAC.2018.00097</u> ***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. DOI: <u>10.1109/ICCITECHN.2017.8281831</u>

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, DOI: <u>10.1109/ICAEE.2017.8255409</u>

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),* pp. 1-6. DOI: <u>10.1109/MEDITEC.2016.7835368</u>

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. DOI: <u>10.1109/ICCITECHN.2016.7860195</u>

Workshop Papers, Posters, and Doctoral Consortia

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

W7. **Maitraye Das.** 2020. Designing for Collaborative Content Creation for People with Vision Impairments. In *2020 Conference Companion Publication on Computer Supported Cooperative Work and Social Computing (CSCW '20).* DOI: <u>10.1145/3406865.3418369</u> [Doctoral Consortium]

W6. **Maitraye Das,** Katya Borgos-Rodriguez, and Anne Marie Piper. 2020. Rethinking Power and Politics in Accessible Making. In *ACM CHI Workshop "Nothing About Us Without Us": Investigating the Role of Critical Disability Studies in HCI.*

W5. **Maitraye Das.** 2019. Who Can See What: Privacy and Audience Management for People with Vision Impairments on Social Media. In *ACM CSCW Workshop on Addressing the Accessibility of Social Media.*

W4. **Maitraye Das**. 2018. Understanding Collaborative Writing Practices of People with Visual Impairments. In *Proceedings of the 2018 ACM International Conference on Pervasive and Ubiquitous Computing (UbiComp '18),* pp. 1744-1749. DOI: <u>10.1145/3267305.3277807</u>

W3. **Maitraye Das**. 2018. Towards Understanding the Effects of Social Networking on Postpartum Depression in Women. In *Grace Hopper Celebration of Women in Computing,* USA.

W2. **Maitraye Das**, Sharmin Afrose, and Tanzima Hashem. 2015. Protecting Genomic Privacy in Medical Tests using Distributed Storage. In *Grace Hopper Celebration of Women in Computing*, USA.

🏆 W1. **Maitraye Das**, Sunandita Sarker, and Shahina Ferdous. 2014. SpeechAid: A Self-treatment System for Individuals with Speech Disorder. In *Grace Hopper Celebration India*. *__Best Technical Poster Award__

Teaching Experience

United International University (UIU)   Dhaka, Bangladesh
Lecturer | Department of Computer Science and Engineering (CSE)   Oct 2015 - Mar 2017
- Instructed courses on Computer Architecture, Digital Logic Design, Electrical Circuits, and Assembly Programming Language.

Course Designed

Accessible Collaboration | Northwestern University   Mar 2021
Completed as a part of PhD qualifying exam | Supervised by **Darren Gergle**
- Designed the curriculum of a Computer Science/Communication Studies upper-level undergraduate course on accessibility in collaborative work. Planned class structure, reading materials, assignments, and term projects 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.

- **Rawan Mohamed** | Computer Science undergrad, Northwestern University   2020
  Learned to perform qualitative coding on user evaluation data.

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

- **Caroline Brewley** | High school student researcher   2019
  Learned to perform a literature review and design sketching low-fidelity prototypes.

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

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

- **Nusrat Jahan Mozumder** | 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.

Skills

Programming: Python, R, C, C++, Java, HTML, CSS
Research Methods: Interviews, contextual observations, ethnography, thematic analysis, grounded theory method, survey design, experiment design, quantitative analysis, prototyping

Invited Talks, Panels, and Demonstrations

- **Accessibility, HCI, and Aging (AHA) research group** | University of Michigan   Nov 2021 (scheduled)
  Talk: Augmenting ability-diverse collaboration

- **Workshop on The Future of Care Work** | ACM CSCW   Oct 2021
  Discussion topic: Rethinking power and politics in care work within ability-diverse maker communities

- **Microsoft Office and Windows Accessibility Team** | Microsoft   Feb 2021
  Talk: Understanding accessibility in collaborative writing for people with vision impairments

- **Input and Interaction (INFO 463)** | University of Washington   Nov 2020
  Guest lecture: Accessibility in collaborative writing for people with vision impairments.
  Paper [J2] was a required reading for the class.

- **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 Conference, HCI Track   2021

Reviewer
ACM CHI [*outstanding review recognitions: 3]   2021
ACM CSCW [*outstanding review recognitions: 2019, 2021]   2019 - 2021
ACM Transactions on Accessible Computing (TACCESS)   2021
IEEE COMPSAC   2021
ACM DIS   2020
Grace Hopper Conference   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
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Northwestern University.
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Anne Marie Piper
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