Maitraye Das

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Research Statement

My research interest falls broadly in 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. My work draws on literature in HCI, CSCW, and critical disability studies to uncover how accessibility is created, negotiated, and sustained in collaborative work. Methodologically, I take a design-oriented, mixed-methods approach that includes qualitative studies (e.g., contextual interviews, observations, ethnography) as well as system development and evaluation through exploratory and experimental analyses. As a HCI researcher, my broader goal is to enhance accessibility through design 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) Fall 2017 - Present
Dissertation: Amplifying 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 & 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 visually impaired writers. Developed auditory representations of asynchronous collaborative features and evaluated these representations through a mixed-methods controlled experimental study with 48 visually impaired writers. Currently developing interactive non-visual techniques to enhance accessibility in synchronous collaborative writing. [CSCW 2019]
  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. [CHI 2019]
  Faculty collaborator: *Brent Hecht*

INCLUSIVE TECHNOLOGY LAB | NORTHWESTERN UNIVERSITY Spring 2018 - Present
Graduate Researcher | 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. [CHI 2020, TACCESS 2021]

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 (e.g., Microsoft Teams). [CSCW 2021]
  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. [ASSETS 2021]
  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 the design of smart technologies for children on the autism spectrum. [CHI 2018]

BANGLADESH UNIVERSITY OF ENGINEERING & TECHNOLOGY 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. [COMPSAC 2018, Journal of Information Processing 2019]

Honors, Awards, & Grants

PhD Student Research Award | Dept of CS, Northwestern University	2021
Graduate Research Grant | Northwestern University ($2,999)	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 Engg. & 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 Engg. & Technology	2011 - 2015
University Merit Scholarship | Bangladesh University of Engg. & Technology	2011 - 2014

Journal Articles

J5. **Maitraye Das,** Anne Marie Piper, and Darren Gergle. Design and Evaluation of Accessible Collaborative Writing Techniques for People with Vision Impairments. Under review in *ACM Transactions on Computer-Human Interaction (TOCHI).* [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]

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),* 22 pages.

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%]

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: 10.1145/3173574.3173676 [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.
DOI: 10.1109/COMPSAC.2018.00097 [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.
DOI: 10.1109/ICCITECHN.2017.8281831

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: 10.1109/ICAEE.2017.8255409

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*

[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, or better than, journals in visibility, selectively, and impact. When available, the acceptance rate is included.

Engineering, Health Informatics and Technology (MediTec '16), pp. 1-6. DOI: 10.1109/MEDITEC.2016.7835368

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: 10.1109/ICCITECHN.2016.7860195

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: 10.1145/3406865.3418369 [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: 10.1145/3267305.3277807

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 | Dept. of **Computer Science and Engineering** (CSE) Oct 2015 - Mar 2017

- Instructed courses on Computer Architecture, Digital Logic Design, Electrical Circuits and Assembly Programming Language.

Students Mentored

Thomas McHugh | Undergrad in Computer Science, Northwestern University 2020 - Present
Rawan Mohamed | Undergrad in Computer Science, Northwestern University 2020
Caroline Brewley | High school student researcher 2019
Nusrat Jahan Mozumder | Undergrad in CSE, Bangladesh University of Engg. & Tech 2017 - 2018
Khandaker Ashrafi Akbar | Undergrad in CSE, Bangladesh University of Engg. & Tech 2017 - 2018
Fatema Khan | Undergrad in CSE, United International University 2016
Ahiya Ahammed | Undergrad in CSE, United International University 2016

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

Input and Interaction (INFO 463) | University of Washington Nov 2020
- Guest lecture: Accessibility in Collaborative Writing for People with Vision Impairments (virtual)

New Future of Work Group Meeting | Microsoft Research Sep 2020
- Talk: Understanding Accessibility in Remote Work for Neurodivergent Professionals (virtual)

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

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