

# Research Statement

## Neelma Bhatti

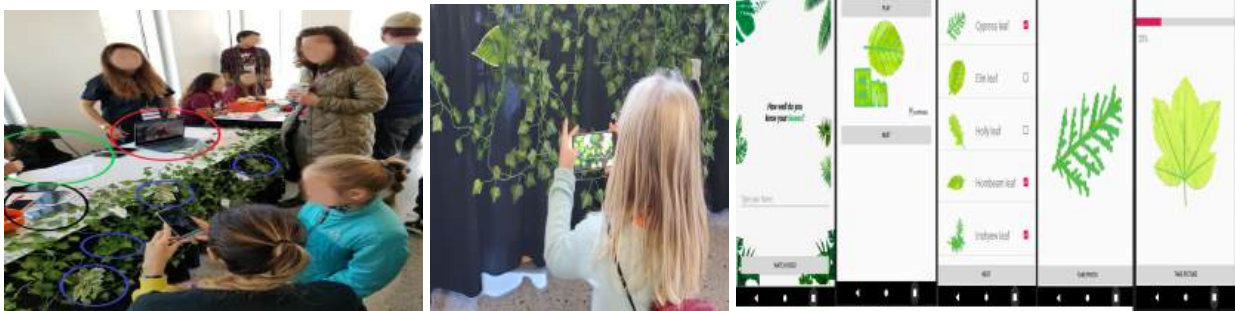
I am deeply passionate about understanding the impact of digital technology and media on young children's lives. My research focuses on Parent-Child Computer Interaction (PCCI) and the design of digital childcare technologies. Utilizing qualitative methods, I investigate how parents utilize technology for parenting tasks and seek gratifications from it. I channel my views in my [blog](#), peer-reviewed articles published in [IEEE and ACM venues](#), and academic [workshops](#) with participants from both academia and industry.

### **Summary of Completed and Published PCCI work at Virginia Tech**

I have completed projects in the two main domains, namely a) Digital Childcare Technologies (DCA) and b) asset-based research. The projects from both categories are listed below:

#### **Digital Childcare Assistants (DCA):**

1. **[ACM Interaction Design & Children 2020](#)**: During a child-focused science festival, we asked participants to try our mobile app crafted for performing a nature-related learning task. Findings revealed that parents were largely involved in their children's tech-facilitated learning, to the point that their interactions were distracting to the child's learning.

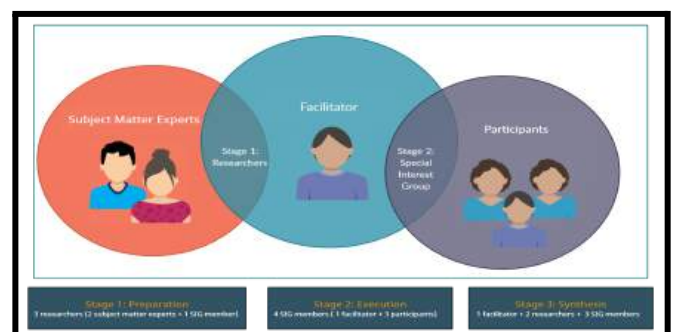


2. **[ACM CSCW 2021](#)**: Using the uses and gratifications theory as a framing mechanism, I interviewed international student mothers in the United States who are primary caregivers of young children, focusing on the context of their use of screen media content and devices, and the gratifications they seek from their children's use of screen media devices. Findings from this research revealed the use of technology as a digital childcare assistant ([ACM Interaction Design & Children 2020](#)) and as children's assistive language learning aid ([ACM International Conference on Interactive Media Experiences](#)). I found potential for developing [technologies for positive distraction](#) that can help parents avoid possible time-consuming behavior disruptions while keeping the child seamlessly engaged so parents can continue working without interruptions.
3. **[ACM Human-Agent Interaction 2020](#)**: I conceptualized an interactive show with characters who can hold believable dialogue with children, as such a show could have the potential to help children with speech delays by encouraging them to participate in a conversation through the use of age-appropriate, context-specific questions. These communications can have a positive impact on the parent's perception of their child's para-social relationship with screen media characters, as in this instance, they would instead be communicating with known people.



#### **Asset-based research:**

1. **[ACM CHI 2020](#)** and **[CHI 2024](#)**: Both of these works employed an asset-based methodology, emphasizing the strengths and resources inherent within cultural communities. The first study emphasized leveraging community assets, like traditional knowledge, to inform technology design for preserving Intangible Cultural Heritage (ICH). The second study showcased a griot-style methodology with an indigenous community, prioritizing oral storytelling traditions as valuable assets. Both studies highlighted the importance of community empowerment and cultural continuity in HCI research, advocating for inclusive approaches to technology design.

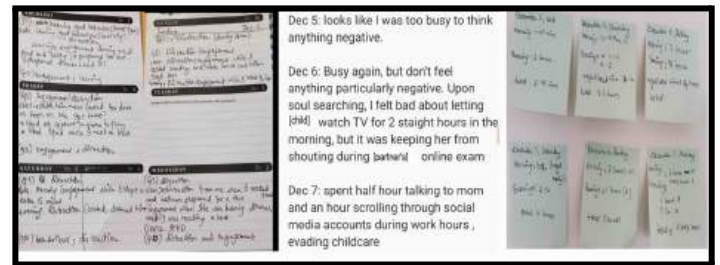


2. **ACM CSCW 2022:** My deep interest in always putting 'people' at the heart of my research led me to employ an asset-based approach to engage a group of parents as research participants and co-authors, utilizing their strengths in writing to capture intimate narratives about their experiences with technology. This asset-based approach prioritized participants' agency, fostering self-reflexive care and offering insights into technology use contexts, particularly for foreign graduate student mothers. This work represents a significant contribution in adapting asset-based methodology to intimate settings, highlighting the importance of participant involvement in research processes.

3. **ACM GROUP 2022:** For community building and engaging a broader set of parents and researchers, I organized and led a virtual workshop titled "Technologies for Children at Home" at the 2022 ACM International Conference on Supporting Group Work, along with prominent researchers in the domain of child-computer interaction. This workshop aimed to engage participating parents' assets i.e. their personal and professional personas to initiate conversations about young children's use of technologies at home, critiques of current research practices in this domain, and other novel ways to communicate and interact with emerging technologies in the home.



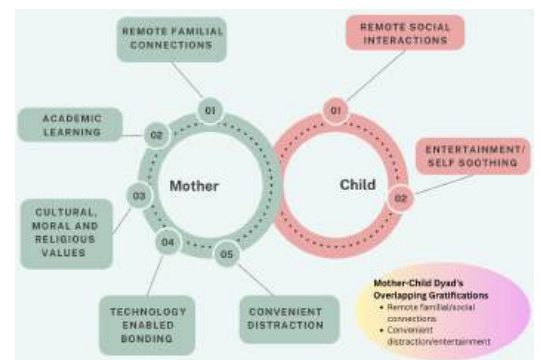
4. **Self-designed probes:** I utilized domain knowledge (both about PCCI and my family) to design and tailor probes for investigating technology use in the domestic environment by engaging myself as a user who is also an active member of research. Findings from this study revealed sensitivities of the domestic environment that need to be accounted for in the design of technologies for families with young children, to avoid unforeseen circumstances and chances of elevating tension between members of the family.



### Child-Centered Design Work completed at Habib University, Pakistan

**Digital Parenting in Pakistan (Summer, 2024):** This summer, I supervised and work with 3 undergraduate researchers to investigate how Pakistani mothers, as primary caregivers, navigate and manage the use of digital media devices for and with their children, examining the interplay between their cultural values and parenting strategies to examine the digital parenting landscape in Pakistan. Specifically, we tried to answer the following research questions:

- What **uses and gratifications** do Pakistani mothers and their young children seek from digital media devices?
- What **strategies** do mothers employ to promote the non-use of digital media devices by **limiting or regulating** their children's exposure?
- How do **Pakistani mothers' patterns of using and not using digital media devices as parenting assistants** differ from and resemble those of other **caregivers globally**.

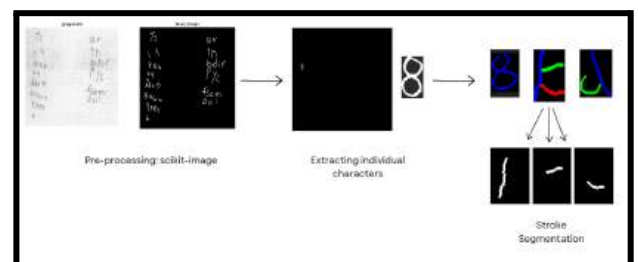


Through an in-depth analysis of the role of digital media devices in Pakistani mothers' parenting practices, we aim to make the following two contributions to HCI and parenting literature

**1) Model of Uses and Gratifications Sought by the Mother-Child Dyad:**

**2) Mother Profiles:** From our interviews, surveys, and ideation sessions, we identify three distinct profiles of mothers based on their digital media use in parenting. These profiles, compared with global practices, provide actionable implications for developing effective parenting technologies.

**ACM Interaction Design & Children 2023:** A group of three students under my supervision undertook a project to help children with reading and writing difficulties, exploring the potential of handwriting quality features in screening for Specific Learning Disabilities (SLDs). We are expanding this as a full study where we are designing behavioral interventions for parents to help them identify and accept their children's need to better facilitate them.



**Human-Computer Interaction for local impact:** Last year, I supervised seven projects as a capstone advisor and teaching an Introduction to HCI class. The broader themes covered include Pakistani mothers' perceptions and struggles regarding screen-based devices for young children, interventions to mitigate gender stereotypical thinking in high school children, digital expression of self by Pakistani youth, and the digitalization of an educational platform for Pakistan Sign Language aimed at deaf and hard of hearing children. The deaf-outreach work was published as work-in-progress paper in [2024 ACM Interaction Design and Children Conference](#).

**Usability testing of commercial screen-based devices for children:** This work was partially supported by a grant from Virginia Tech's Institute for Creativity, Arts, and Technology for \$3000. I examined the effectiveness of commercial devices designed for children, particularly Amazon's "Glow," in facilitating remote connections with family members. Through personal use, evaluation in various settings, and collaboration with undergraduate students, I assessed the device's usability and explores potential enhancements in design and features.



### **Long-term Research Agenda**

As a researcher holding a National Interest Waiver (Eb2-NIW visa status), my proposed research focuses on employing participatory and ethnographic methods to enhance caregiving for families and children through technology. My overarching goal is to align the gratifications sought by both caregivers and children using digital media, particularly child-centered screen-based technologies. To achieve this, I intend to pursue the following research directions and contribute in the areas of design of technologies for PCCI, and research methodologies for engaging sensitive populations.

**Investigating Key Gratifications Sought by Young Children (1-5 years):** As a follow-up to this [CSCW 2021](#) work, I aim to seek answers to the following research questions:

- What are the **key gratifications sought by children** aged 1-5 years?
- How can we effectively navigate and reconcile potential **conflicts** between the **gratifications sought by young children and those desired by their parents**?

**Empowering Caregivers Through Collaborative Design for Digital Childcare Assistance:** As a followup to this [CSCW 2022](#) work, I am interested in exploring the following questions:

- How can caregivers be supported in effectively utilizing **digital technologies as childcare assistants**, and what strategies enhance their informed integration into caregiving practices?
- In what ways can **collaborative efforts between caregivers and technology designers** lead to the customization of digital technologies for children, ensuring the satisfaction of PCCI needs while promoting **usability** and **profitability** in the design process?

**Design Fictions and Provocations for Critical Discourse:** My primary interest also lies in creating design fictions and provocations to **instigate change and critical thinking** related to matters that generally receive less attention, especially in the context of the global south. I derive immense pleasure from designing short design fiction entries and writing opinion pieces on my blog to satisfy my creative impulses. This engagement also motivates me to explore the research domains listed above and helps me push out raw and bold ideas in the mainstream without the constraints of traditional publishing timelines. Embracing this as a life-long pursuit, the research question that I seek to explore the following personal research questions:

- How long can a researcher engage in public discourse without a defined target audience?
- How does this engagement impact their worldview, creativity, and sense of independence from traditional publishing structures?

**Through these endeavors, I strive to contribute to the design of technologies that enhance caregiving practices and support children's holistic development, leveraging my assets in creative thinking, research methodologies, and community engagement.**