Research Statement

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My research lies in the areas of Human-Computer Interaction and Ubiquitous Computing. My work examines the values of users and designers, and how those values influence the user-centered design process. I look reflexively at the design process to see how our implicit biases and practices shape the artifacts we design, especially as we reconcile the values of designers and users. I use a multi-disciplinary theoretical approach that draws from anthropology, gender studies, science and technology studies, design research, social informatics, and ubiquitous computing.

My research uses qualitative, largely ethnographic studies to understand technology use and values associated with technology in order to create grounded theory. Additionally, as a member of interdisciplinary design teams, I use these grounded theories as the starting point for ubiquitous computing design interventions that explore values and social justice. This in turn allows me to refine my theoretical contributions, as well as the values with which I imbue of the technologies themselves.

Gender

My research's unique contribution is using feminist theory of computing to explore the problematic relationship between femininity and technical mastery, and what this means for technology design and gender equity in Science, Technology, Engineering, Arts and Math (STEAM). My research was first in the HCI community to lay out the relevance of the connection between computing and feminist theory. Based on an ethnographic study I created a socio-technical model of gender and technical identity that breaks down the various factors that comprise gender and technical identity. This is critical for discussing gender diversity in STEAM without conflating sex and gender, and gendering of people, tools and social roles. I have explored the gendering of technology by creating a smart closet, a Ubicomp RFID augmented wardrobe that allowed girls to explore fashion, technology within a social media enabled context. It was a proof of concept that one could design to avoid girls feeling 'gender inauthenticy,' in that technology could be simultaneously feminine and cutting edge without resorting to binary gender. Further, in a follow on study I showed feminine technology such as e-textiles do encourage computational literacy for girls while at the same time, still being engaging to boys. In a second follow on study, I examined best practices for teaching computational literacy to children with e-textiles, and here I argued STEAM as applied to Ubicomp requires additional skills. I proposed 'Computational Making' as a new model for computing education off the desktop.

My work outlines gendered patterns of use surrounding end-user programming; more importantly, my work establishes that indeed, technology is used to construct and negotiate gender identity in that technology is an object around which individuals negotiate their *Gender and Technical Identities* (Rode, 2011). If we socialize children in socially approved attitudes towards gender and technology, the co-construction of Gender and Technical Identities suggests a fundamental conflict for women who wish to fully participate in technology. My work seeks to understand this tension, document it, and construct critical theory to inform design. I am going forward with a program of Gender-Sensitive Design which is mindful of the bidirectional nature of technology's ability to socially shape, and to be impacted by, society. My work suggests a masculine implicit bias in both usability evaluations and design processes, and while my prior research characterized the nature of

this bias, additional research is required to further understand and advance user-centered design practice that addresses this bias. I argue framing the gender issue in computing as 'too few women' is problematic as it equates biological sex with gender identity. Instead, I say the problem is there not being enough social space for people to express a range of gender identities across the gender spectrum. I argue computing is especially hostile to women and men who construct feminine gender identities. My goal is to create critical theory on the gendered co-construction of technology and identity that avoids heteronormative tropes, as well as create guidelines of best practice for Gender-Sensitive Design.

My long term career goal is to create a feminist theory of embodiment for HCI. Research such as Paul Dourish's "Where the Action Is" have discussed the importance of embodiment in Ubicomp, and work such as Ulf Mellström's "Patriarchal Machines and Masculine Embodiment" have discussed the typically masculine nature of embodiment in technology. Women's bodily experiences through pregnancy and experience of risk are different from men's, and a gender diverse theory of embodiment would need to take into account a range of gendered experience including LGBT perspectives. Only by ensuring gender diversity can theories of embodiment be relied upon in framing Ubicomp interactions.

Privacy and Values

A second key area of my research looks more broadly at values beyond gender, especially domestic privacy and security concerns. I showed that domestic roles were critical in shaping peoples' knowledge and use of privacy and security practices. Further, my study of Facebook and social media practices has showed how religious practice is designed into technology. Here Western values failed to resonate with Middle Eastern users, and how technologies were readapted to local values. This was especially problematic in the area of passwords where Western feminist egalitarian practices were codified in terms of service and yet at odds with observant Muslim practices where patriarchs were responsible for the safety of female family members. Consequently, this led me to question whose values were being discussed when engaging in Value Sensitive Design. I explored tensions between Muslim and Judeo-Christian values, and values of designers versus users using Islamic Feminist theory. This paper has prompted considerable discussion in the community including Borning & Muller's "Next Steps for Value Sensitive Design." Through my CAREER award and through the selection of demographically diverse fieldsites I will engage in Participatory Design to further explore values and methods of making these value tensions explicit in technology design. Further, I would like to create tools that allows designers to explicitly identify and address value disconnects between themselves and stakeholders.

Research Performance

I have a strong publication track record; my ACM citations show ~15,000 downloads with an average of 620 downloads per publication. Google Scholar shows my having over 985 citations, an h-index of 17, and an i-index of 24. I have won considerable external funding including a CAREER award. This includes three grants as PI with 100% share totaling $574,974 in income, and two grants as a Co-I (7% of $1.8million, and 50% of $96k). I was also the faculty advisor on a NSF Graduate Student Research Fellowship. I have had the opportunity to publish with six CHI Academy Members: Susanne Bødker, Paul Dourish, Wendy Kellogg, Sarah Kiesler, Bonnie Nardi and Abigail Sellen, as well as several notable design researchers including Mark Blythe, Haakon Faste, Jennifer Mankoff, and John Zimmerman. I look forward to the opportunity to continue to excel in my research and these collaborations exploring issues of gender, values and privacy in ubiquitous computing.