Digital Assistants

Miriam E. Sweeney – The University of Alabama

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Miriam E. Sweeney

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Introduction

In machine learning, "uncertainty" describes the margin of error of a given measurement as a range of values most likely to contain the "true" data value. A critical cultural approach to digital assistants reframes uncertainty into a strategy of inquiry that foregrounds the range of cultural values embedded in digital assistants. This is particularly useful for exposing what sorts of ideological "truths" are enclosed and/or foreclosed as part and parcel of the design, implementation, and use of these technologies. Exploring the anthropomorphic design of digital assistants through feminist and critical race lenses requires us to confront how dominant ideologies about race, gender, and technology form a kind of cultural infrastructure that undergirds technology design and practice. From this perspective, uncertainties emerge about the "common sense" of anthropomorphic design of digital assistants, particularly surrounding how this design strategy is employed in ways that target vulnerable communities at the behest of state, corporate, and commercial interests. I argue that digital assistant technologies mobilize beliefs about race, gender, and technology through interface design as a way to strategically cultivate user experience, interpellate users as subjects, dismantle worker protections, and otherwise obscure (or "smooth") vast intimate data capture projects. Tracing, and destabilizing, the role of anthropomorphic design in these systems is a necessary step for mapping the larger roles that digital assistants play in facilitating intimate data capture for the networked data environment.

The big data turn

Digital assistants, also known as virtual assistants or virtual agents, can be broadly defined as autonomous entities that "act on behalf of the user in a virtual (computer-based) environment" (Laurel 1997, 208). Apple's Siri, Microsoft's Cortana, and Amazon's Alexa are prevalent examples of these kinds of intelligent technologies. This suite of digital assistants has come a long way from earlier conversational "chatbot" instantiations (e.g. ELIZA, A.L.I.C.E.) due to a combination of advances in machine learning, microprocessing, natural language processing, and speech recognition. These developments were dependent on the growth of cost-effective and scaled-up computing infrastructures (e.g. cloud-computing, server storage, data processing), which were necessary to create the conditions for compiling and mining massive data sets. As a result of these innovations, digital assistant technologies have become more ubiquitous and "intelligent" in their applications: tackling complex problems with greater accuracy, and being used in conjunction with predictive analytics tools. Thus, the growth of intelligent digital assistants has rested on big data as both the driver of technological innovation, and of the consumer data business model.

In recent years we have seen intelligent digital assistants (like Alexa) move from personal use in the home, to the workplace and other public or semi-public spaces. Similarly, digital assistants, long common in online customer service interfaces, have been increasingly incorporated into fundamental civil services such as education, health, and e-government. These shifts have tremendous implications for user privacy and human rights. Critically, as people's everyday activities at home and work become more entwined with (and framed by) digital technologies, the potential for both overt and covert data capture has intensified. Digital assistants play a role in this data capture by seamlessly integrating data networks across platforms via the Internet of Things (IoT) technologies, mobile devices, smart watches, personal computers, smart-home technologies, security systems, and numerous other third-party

applications. Digital assistants capture intimate user data in the form of biometric data (e.g. voice recognition, facial recognition), consumer habits, internet based transactions, personal information, and geographical information tracking. The extended capture of intimate user information over time has created extensive data archives that are reliant on cloud-based storage, private ownership of data, outsourced data processing, and data-sharing across entities to function. Given the current information environment of the United States, characterized by the permissive surveillance policies of the USA PATRIOT ACT, there are low-to-no-barriers for state access to much of this personal data, and few policy frameworks for accountability or transparency for how user data may be used to shape differential life opportunities, perpetuate inequalities, or otherwise target vulnerable communities.

Yet, this landscape is largely invisible to users who are encouraged by the parent companies to view digital assistants as a fun, convenient, and efficient intermediaries for personal information seeking and management. For instance, voice-activated controls via "wake words" (e.g. "Hey, Siri"; or "Alexa) are advertised as a playful convenience feature in commercials that highlight actors like Jamie Foxx and Samuel L. Jackson flirting with Siri, or Alexa "reading" children an audio book before bedtime. In reality, the ubiquitous "always on" feature has raised privacy questions about the extent of user interactions that are recorded, and how these files are processed, transcribed, and stored (Humphries 2019). Design strategies that mitigate, or mask, the uncertainties of extensive intimate data capture play a crucial role in the deployment of digital assistants. Anthropomorphic design helps translate digital assistants into the "friendly" interfaces of these advertising fantasies, purposively obscuring (or "smoothing") the imperatives of big data that this landscape depends on.

Inter/facing digital assistants

Anthropomorphism is leveraged in digital assistant design as a key strategy for translating the uncomfortable or unfamiliar—in this case interacting with computers and surveillance technologies—into the acceptable via familiar extensions of human sociability. Interface design conveys assumptions about the desired use of the interface and overall anticipated user experience (UX), and establishes a set of interpretive possibilities for users. Stanfill (2015) characterizes the interface as a site where productive power is mobilized, producing ideological "truths" in the form of normative claims about both the uses and users of the technology in question. Digital assistants thus emerge as sites of discursive practice that convey not only acceptable *uses* of technology, but also acceptable *subject formations* for users.

Anthropomorphic interface design draws explicitly on gender and race as ideological frameworks to create identity markers in digital assistants that activate particular social scripts as a key part of user experience (Sweeney 2016a). Overwhelmingly digital assistants are represented (in North American markets) as white, middle-class, Anglo women. Digital assistants can be explicitly gendered through their embodied representations, their naming, their vocal stylings, and the tasks they perform. Importantly, digital assistants are also feminized through their alignment with domestic work, affective labor, service roles, and care-giving (Sweeney 2016b, 225). For instance, IKEA's digital assistant "Anna" is designed as a smiling white, blonde woman wearing a headset like a call center worker. On the other hand, the early digital assistant "Jeeves," from Ask.com, was represented as a butler. In the cases of Anna and Jeeves, these two representations convey two different sorts of gendered labor: the feminized call

center worker, and the male butler domestic worker. Each are linked to distinct service work industries that have unique cultural histories as they intersect with class and gender roles. Accordingly, these representations also convey different formations of the user role, that of a customer or master of a great house, respectively.

Digital assistants are often culturally coded as feminine through their oral and textual speech patterns, their names, and their default voice interfaces. For example, Apple's Siri co-founder Adam Cheyer (2012) describes "Siri" as having multi-faceted meanings that the team intended, including: the Norse translation for "beautiful woman who leads you to victory"; the Swahili word for "secret"; and the Sinhalese term for "beauty". Similarly, Microsoft Cortana is named after the fictional synthetic intelligence character from the Halo game series who appears as a sexy, nude female avatar. Amazon's Alexa uses a female name, derived from the ancient library of Alexandria, that was chosen for its presumed uniqueness in daily user lexicon, an important feature for a wake word. Both Alexa and Cortana default to female voices with no option for male voices in the interface, while Siri has a default female voice in most languages, but defaults to a male voice in defaults to a male voice in four languages: Arabic, French, Dutch, and British English. This demonstrates how developers deploy gender in digital assistants in ways that conform to culturally specific gender scripts.

The racialization of digital assistants is complex and may be explicitly or implicitly encoded aesthetically through embodied representations (skin tone, phenotype), dialect and speech patterns. Often racialization is signified as a form of "default whiteness" that is assumed of technologies (and users) unless otherwise indicated (Nakamura 2002). Dinerstein (2006) locates whiteness as part of the technocultural matrix, arguing that technology functions as a kind of white mythology, embodying ideas of modernity, progress, masculinity, and the future. Digital assistants represent a fusion point of ideologies of race, gender, and technology, where the unmarked technology (or, virtual body) is assumed to be white, "and therefore unproblematic and uncomplicated as a design option" (Sweeney 2016b, 222). The default assumption of whiteness, present in the majority of digital assistants, creates a normative technological framework that reinforces hegemonic cultural narratives about whiteness (and technology) as objective, trustworthy, and authoritative.

Designers treat gender and race as variables that can be adjusted to optimize user experiences by promoting goals such as "trust", "friendliness", and "credibility" in the interface (Bickmore, Pfeifer, and Jack 2009; Cowell and Stanney 2009). In focusing on user experience and believability as units of analysis for evaluating digital assistants, "designers may also fail to see how their software systems are shot through with assumptions about gender, race, ethnicity, users, and so on" (Zdenek 2007, 405). Categories of "trust" and "credibility" are already mediated by beliefs about race and gender, producing powerful cultural narratives about subjects (e.g. Black masculinity and criminality, or white femininity and purity) that are continuously redeployed as a form of disciplinary social power and control. Unfortunately, the focus on gender and race as design attributes rather than as vectors of social power, leads designers to deliberately utilize these stereotypes under the guise of "user preference" and marketplace logics (Sweeney 2016b). For instance, studies that demonstrate user preference for female-voiced computing interfaces (Mitchell, Ho, Patel, and MacDorman 2011), tend to be used to justify female-voiced agents as an effective design strategy, one that is divorced from the cultural frameworks that shape this acceptance. In a well-cited study, Nass, Moon, and Green (1997)

demonstrate that user preferences for female or male voiced interfaces tends to be linked to the gendered agreement of the interface and the content, rather than the gender of the user. Their findings reveal the following: that participants were more likely to take evaluation from male voices than female voices; that dominant roles for female voiced computers were not as accepted; and that participants preferred male voices when tutored on "masculine" topics like computers, whereas female-voiced computers were seen as more informative on stereotypically feminine topics like love and relationships (Nass et al. 1997). These findings, and others like them, are recycled continuously until they operate as a kind of cultural "common sense" design practice, obscuring their linkages to historically specific and socially-produced systems of oppression.

Gender and race as UX

Digital assistants are specifically racialized and gendered as a function of the contexts of their use, including which audiences they are targeting, what kinds of tasks they perform, and the broader the objectives and mission of the entities that design and deploy them. For example, Alexa and Siri are aesthetically coded as native-English speaking, educated, white women that are positioned through their advertising as a kind of idealized domestic servant that helps to manage the home (Phan 2019, 4). Both technologies are marketed to highlight the service and care-giving roles of these technologies, interspersing intimate vignettes of banal domestic life to underscore the capacity of these technologies for keeping pace with middle class standards for domesticity. A variety of domestic activities are represented in these advertisements, including: preparing for a date, cooking dinner, putting kids to bed, getting ready for work, scheduling playdates, and answering conversational questions during a family meal (Sweeney 2017). These social scripts privilege markers of white, middle-class, heteronormativity, that tend to sentimentalize the nuclear family and traditional domestic ideals (Phan 2019, 7).

Phan makes the case that the labor provided by the digital assistant preserves the identity of the working mother, in ways that have historically mimicked "the reciprocity between early twentieth-century middle-class women and their servant staff (14)". The racialized and gendered aesthetics of Alexa and Siri "decontextualizes and depoliticizes the historic reality of domestic service" (Phan 2019, 4), obscuring the servant labor of poor women and women of color. The user experience that Amazon and Apple sell through these technologies rests on the promise of class privilege and aspirations of respectability. These aspirations create new entry points for centralized data capture in intimate spaces, including opportunities for access to previously hard-to-obtain or protected data sets, such as children's personal information (Harris 2016).

Digital assistants in customer service contexts (tend to) replicate gendered labor divisions that have historically shaped information labor and service industries. These industries are heavily feminized, meaning they are overrepresented by women workers and tend to be low-paid, low-status, and precarious positions. As in the Alexa example, though women of color are overrepresented in customer services industries, these digital assistants remain predominantly white with middle-class aesthetic trappings, effectively erasing the labor of women of color, and creating a skewed representation of the realities of information labor. Poster argues that the selective visibility of the worker is "at the heart of reconfiguring the labor processes of these services" (2016, 89). Automating labor tends to further entrench existing gendered and racial hierarchies rather than subverting them. Digital assistants like the holographic, embodied airport

workers designed by Airus Media (2015), are sold as ideal workers who work tirelessly without end ("Works 24 hours, 7 days a week and never takes a break!"), allowing employers to harness labors without extending basic labor rights to real laborers.

Though the majority of these digital assistants are also portrayed as white, Anglo women, it is interesting to note the contexts where this is not the case. Airus Media deploys digital assistants that are culturally coded as Latina Transportation Security Administration (TSA) agents in airports along the United States/Mexican border, giving new meaning to the brochures' exclamation, "No background check required!" This statement hints at the tensions between the desire for cheap labor as a driver of the United States' economy, and the xenophobia of white Americans towards Latinx people that shapes immigration anxieties and worker rights. These digital assistants are positioned as the answer for harnessing the labor of Latina information workers, without actually hiring Latinas. These "digital solutions" continue a long history of the simultaneous reliance on and invisibility of Latina information labor in technology industries (Villa-Nicholas 2016).

The Latina identity works as an affordance in these interfaces to mitigate the hostilities that Latinx people face when coming into contact with U.S. federal agencies. "Emma," named after Emma Lazarus, is the Latina digital assistant used by the United States Citizenship and Immigration Services' (USCIS) as an extension of their call center on their website. Unlike Alexa or Siri, Emma relies on text-based, user-inputted data, which is often highly personal in nature, particularly for users seeking critical government services such as those pertaining to immigration and citizenship. Emma's design as a light-skinned and white-passing Latina, along with English-first language skills make normative claims about the face of the "good" citizen that are aligned with the ability to assimilate (Villa-Nicholas and Sweeney 2019). Emma is presented as a "trusted ethnic friend" for presumably Latinx audience, obscuring the data-gathering that is the cost of interaction through this interface. Emma cultivates a user experience that relies on hegemonic notions of racialized gender to bring users into acceptable forms of citizenship, *vis-à-vis* engaging with the interface in ways that produce them as informationally legible subjects (Villa-Nicholas and Sweeney 2019). Undocumented people, and people otherwise seeking paths to immigration and citizenship, are made vulnerable through this process, with little recourse but to use digital assistant technologies as semi-compulsory access points to government services.

Remaining critically uncertain

Though anthropomorphism has emerged as a kind of "common sense" design strategy for digital assistant design, critical uncertainty can help destabilize it as a "natural" choice for interaction with computers. Anthropomorphism draws its power from explicitly leveraging interlocking power structures such as gender, race, class, and sexuality in service of cultural narratives that support design goals. Digital assistants are marketed with promises of efficiency, cost-saving, convenience, respectability, and security, yet these "benefits" are mostly enjoyed by the state, commercial, and corporate actors who design and deploy these technologies. Anthropomorphism provides a cultural layer to help underscore those affordances, smoothing the uncertainties that come with the adoption of digital assistants, and obscuring the oppressive imperatives of big data projects. Yet, seeking to simply refashion, or otherwise mitigate, anthropomorphism as a design strategy misses the point. Anthropomorphism is but one strategy

meant to cultivate user trust in the face of harmful data practices that rely on intimate surveillance. For users, trust—the willingness to rely on the promise of digital assistants—should remain critically uncertain until more robust user protections and regulatory frameworks are put in place to protect (particularly, vulnerable) user communities.

<div style="text-align:center">References</div>

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