

Post-Userism

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ABSTRACT

HCI is focused on improving the interactions we have with technology and innovating new types of interactions, as well as expanding the types of people for whom those interactions are designed. Central to these efforts is the simultaneously empowering and contested construct of the “user.” This paper examines what the construct of the user highlights, as well as what it conceals. We introduce *post-userism*, a perspective that simultaneously acknowledges the limits of, and proposes alternatives to, the central construct of the user as proxy for the “human” in HCI. Drawing on developments across the historical trajectory of HCI, we articulate how the user is enacted across four different levels of representation—systems, interface, design process, and the ideology—and identify situations where the user breaks down. Synthesizing prior work, we offer a series of strategies for grappling with such situations. In doing so, we seek to overcome the limitations imposed by the user and develop a language that will aid in evolving the foundations of HCI by asking what, exactly, we place at the center of our scholarship and design.

Author Keywords

HCI, post-user, post-userism, interaction design, use, theory

ACM Classification Keywords

H.5.m. Information interfaces and presentation (*e.g.*, HCI): Miscellaneous.

INTRODUCTION

Human computer interaction examines the interactions between computational systems and human beings. While seemingly obvious, the simplicity of this statement belies numerous underlying tensions. When originally articulated, HCI was “a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them” [50:5]. In other words, the

primary, or perhaps even the only, kind of interaction of interest was when a human was using a computer. Put differently, users are the *raison d’être* of HCI.

In this paper, we demonstrate how a myopic focus on the user prevents us from fully accounting for the diversity of interactions between humans and computers, either in our scholarship or in our design work. Enumerating subject positions beyond “user,” as well as articulating the relationships among them, helps to broaden the scope of interactions for which HCI can account.

From User to Post-user

HCI has experienced significant successes in its mission to bring the human user to the forefront of both the study and the design of technology. User interface design, groupware, social media, e-commerce—these arenas demonstrate how the practices of user-centered design have empowered technology users, making them the focus both of HCI design and scholarship.

Part of user-centered design’s strength comes from a willingness to elevate anyone to the status of user. The most common way to account for the H in HCI is to cast that person as a user. In effect, to “user-ify” people—transforming people into representations within our systems, interfaces, design practices, and discourse—has become more than our method, it has become our ideology. With this ideology comes a set of values, principles, and commitments that shape what we do and how we do it.

Engaging people through the lens of the user is a double-edged sword. On the one side, calling someone a user and centering a design around them has significant potential for empowerment. However, HCI also has a fraught relationship with the term “user.” Our misgivings are concisely captured in Tufte’s popular quote that “only two industries refer to their customers as ‘users’: computer design and drug dealing” [10]. Meanwhile, faced with more than nomenclature, HCI researchers and practitioners have increasingly encountered interactions with computers that fall outside the traditional scope of use.

The broadening scope of human-computer interactions becomes evident in recent work. Numerous studies have identified niches of “invisible” groups [21] who often reside “out there” [83] beyond the well-educated, affluent, industrialized contexts of much technology research. People in developing regions who do not have direct access to or ownership of certain devices (due to cost, lack of literacy,

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CHI 2017, May 06 - 11, 2017, Denver, CO, USA

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ACM 978-1-4503-4655-9/17/05...\$15.00

DOI: <http://dx.doi.org/10.1145/3025453.3025740>

access constraints, etc.) will interact with technology via an intermediary, who uses the technology on their behalf [75]. Examples also occur in contexts more familiar to many in the HCI community. Individuals at times create single-use, “throwaway” accounts to post content or questions they do not want linked with their primary online identity [65]. The complexities of algorithmically-based systems, such as search engines, can lead to inadvertent associations, *e.g.*, between gay men and sex offenders [1] or between African Americans and incarcerated criminals [7,82]. Social media profiles for deceased users are transformed by their friends and family into memorial pages [16,17]; the people “using” such profiles differ from the site’s representation of who the profile’s user is. Recent interest in technology non-use [9,76] is also symptomatic of this larger condition. In each case, there exist relationships and interactions with computing technology—the beneficiaries of an intermediary, individuals with multiple throwaway accounts, subjects of algorithmic discrimination, mourners—that fall beyond the traditional bounds of “user.” Focusing on the person who “uses” the computer limits our ability to perceive, let alone to design for, these other kinds of configurations.

In order to move beyond the “user”, we borrow from humanistic discourse and theorizing of *subjectivity* and *subject positions*. As described by [5], subject positions speak to the “social roles that people are thrust into” while subjectivity refers to the “felt experience... of individuals” in a given position [5:134]. Subject positions in HCI include “power users, novices, early adopters, and non-users; [...] gamers, trolls, and n00bs; standard users and admins; [...] makers and hackers; [...] and many more” [5:134]. Subject positions are relational, both exists because of and is defined by its relationships within an ecology of other subject positions. This quality makes them an ideal way to talk about human-computer relationships, and the way that HCI’s users frame subject positions and subjective experiences.

How can we do so in a principled way that facilitates both rigorous scholarship and informed design practice? At first glance, documentation of these alternative subject positions may seem scattershot, a disorganized effort to recapture the remainder. However, looking across such examples, underlying structural similarities emerge that span the diverse niches. Explicating such similarities offers an approach that we term *post-userism*. In many ways, the user is a modernist notion [74], one that emphasizes the values of efficiency, calculability, and predictability. In turn, the modernist impulse essentializes the subject position of the user [37]. Responding to the modernist thinking that permeates much of the work in HCI [*cf.* 20], our terminology is meant to invoke concepts from post-modernism, post-structuralism, and post-humanism [22,23,30,36,37,57,62,64]. Doing so can enable HCI, both in scholarship and in design, to account for the diversity of interactions that can occur among humans and computers.

The argument presented here proceeds as follows. We first track the historical development of the ideology of the user across scholarship in HCI. We then describe how the construct of the user appears and is used differently across four levels of representation: systems, interface, design process, and ideological. These four levels provide an analytic perspective that we use to examine a series of examples from prior work in HCI, describing how post-userism occurs when there are breakdowns across levels of representation. We then synthesize across these examples to present a series of strategies both for identifying and for grappling with post-user scenarios. We conclude by offering an outline of how post-userism can offer a conceptual foundation for simultaneously expanding and strengthening the scope of HCI.

THE IDEOLOGY OF THE USER

What, then, is a user? To some extent, being a user represents a particular type of relationship, *i.e.*, a particular subject position, that people can have in relationship to technology. In the words of the software engineering ISO standard, “a user is ‘an individual or group’ who ‘uses [a] software product to perform a specific function’ and ‘benefits from a system during its utilization’ [8:3295, citing 52,53]. However, the user is also a rhetorical device used both to justify the existence of HCI as a field and to distinguish it from each of computer science and cognitive psychology [27]. In practice, the user enables us to engage with and account for human beings who will interact with computing technology during the design and evaluation of those technologies. However, as we argue below, the dominance of the user simultaneously constrains the types of human-computer interactions we can meaningfully account for in our research.

To be sure, “user” is not the only term used to refer to human beings in HCI. Experimental subjects, ethnographic informants, social network egos and alters, gamers, museum attendees, employees, citizens—these and many other roles lie within the purview of HCI research and practice. When it comes to design, though, we generally account for these humans who use the technologies we build and study as users. The *ideology of the user* refers to this impetus to “user-ify” people, that is, to see or place people in the subject position of technology user.

The user, however, does not exist as an *a priori* entity. Rather, it is repeatedly created, enacted, and reified over the historical development of HCI [27,90], albeit with some changes along the way. Here, we track that evolution of “user.” In doing so, we show that the notion of the user continues both to exist and to exert significant influence, despite numerous large-scale intellectual and practical shifts in the field.

Here Come the Waves: A History of User

Different observers have offered varying accounts of the history and development of HCI as a discipline [*e.g.*, 42,47]. Of particular relevance here is Bødker’s [11]

articulation of three waves of HCI. For our purposes, these waves can be characterized by their responses to each of three definitional questions:

1. What is a human?
2. What is a computer?
3. What is an interaction?

Answering these three questions plays an essential role in articulating the default subject position of the user: a human interacting with a computer.

First Wave

First wave HCI is grounded in its disciplinary ancestors: cognitive/experimental psychology and computer science, most notably exemplified by the text *The Psychology of Human-Computer Interaction* [25]. This paradigm emphasizes quantitative metrics of improved performance, especially speed (faster is better) and errors (fewer is better). Fitts' law [35] as applied to interface design provides a prototypical example. Both its mathematicality and its objects of interest—time, distance, size—are characteristic of first wave HCI. The modernist [74] values of efficiency, calculability, and predictability become clearly apparent in this formulation. To be clear, research still actively pursues first wave types of questions. Thus, first wave constitutes HCI in the following way:

1. A human is a rational actor trying to optimize performance (increase speed, reduce errors, etc.).
2. A computer is an information processing device to enable that rational actor to perform its task.
3. An interaction is an information exchange between human and computer (e.g., GOMS [25]).

Thus, the first wave user is a rational actor who functions as part of an information processing loop with the computer. In practice, this generally means a single human sitting in front of and operating a single computer terminal. This model human processor [24,25] becomes the canonical depiction of the user, the one from which future conceptions of the user arise and against which alternative conceptions are contrasted.

Second Wave

Second wave HCI moves, as it were, “from human factors to human actors” [4]. An important component of this shift involves acknowledging the context in which computer use occurs. In the case of second wave, this context was often one of professional work, including the ways that individual technology use both shapes and is shaped by the group(s) and/or organization(s) of which that individual is a member [41,43,69]. Furthermore, the human is treated as a situated actor [81] with her or his own plans, motivations, goals, etc. These shifts result in the following constitution of HCI:

1. A human is a *situated actor* (often a member of an organization) trying to accomplish a task within a particular organizational context, often as part of a

group of other people who may be members of the same or different organizations.

2. A computer is a *software application* used in the conduct of work (calendar, spreadsheet, word processor, etc.).
3. An interaction involves *using software to accomplish a goal*, often related to the individual's work context.

Thus, the second wave user is a situated actor who employs software applications to perform the tasks associated with her or his job within the context of a particular work and/or organizational setting. In these ways, second wave HCI moves to acknowledging the presence of multiple users, each of whom is interacting either with their own or with shared software application(s). The focus on the user, though, is still paramount. Second wave HCI is driven by developing “a better understanding among researchers, and many system designers too, about the ‘users’ of computer systems” [4:25]. On one hand, Bannon argues convincingly for treating people as more than “just” users, acknowledging that they are simultaneously workers, practitioners, etc. On the other, the focus in second wave very clearly remains on the people who directly interact with, *i.e.*, use, the system.

Third Wave

The third wave of HCI begins to grapple with life outside of professional and organizational work contexts. Moving beyond the workplace and productivity, computing takes on numerous varied roles: leisure [14,15], socializing [60,61], gaming and sport [3,26], sensing and expressing emotion [12,79], cultural production and meaning making [46,86], etc. As computing moved “off the desktop” [87] into smartphones, mp3 players, cars, tablets, etc., it moved into myriad other facets of our lives. These developments constitute HCI in yet another way:

1. A human is a person engaging in (a set of) *socio-cultural practices* embedded within a numerous broader contexts, including cultural, historical, political, organizational, etc. [52]
2. A computer is a *technological system* that may consist of a single device, a constellation of devices, an infrastructure, or a more complex assemblage that arises from and is embedded within a particular set of contexts.
3. An interaction is the *experience* [31,91] of leveraging a technological system in the course of an individually, socially, or culturally meaningful practice.

Ultimately, the model is of a human using technology to engage in socio-culturally situated practices.

Thus, the third wave user becomes a person using technology to engage in socio-culturally situated practices (commerce, leisure, artistic performance, sport, etc.). Work along these lines includes situations involving one user and

one device (*e.g.*, me and my smartphone), multiple users at one device (*e.g.*, large shared displays), one user with multiple devices (*e.g.*, how I manage data across my smartphone, tablet, laptop, and server), and multiple users with multiple devices (*e.g.*, almost any kind of ubicomp system). In each of these configurations, the user remains paramount. This focus can be seen, for instance, in the emphasis on user experience, or in Bødker's interest in "the work that the human user does to make multiple objects and mediators work together" [11:3].

How the Ideology of the User Empowers and Constrains

The comparison of the three waves of HCI in the previous section shows important differences and striking commonalities. Despite shifts in the disciplinary traditions invoked, in the methods applied, and in the technologies of interest, we see continued ideological focus on the user. While the scope expands—to include organizational context in second wave and sociocultural context in third wave—the analytic focus remains the user. Technology wants users, and HCI wants to see people as users.

The ideology of the user does not refer to an imperialist urge to encourage all persons everywhere to adopt a given technology (although this is a dominant trend in HCI [76]). Rather, it is the requirement that, if we want to talk about a person meaningfully within HCI, we need to be able to talk about them as a user.

An Example

For instance, consider photo-sharing on social media. Third wave work would certainly acknowledge the cultural embeddedness of this activity. A given design may allow a photographer to capture and/or express elements of the experience in which the photos were taken [58,88]. And what of the person who appears in the photo? S/he can comment on the photo, tag or untag her/his likeness in the photo, request to have the photo taken down, post her/his own photos in response, or engage in other socioculturally meaningful practices. All this functionality, though, becomes unavailable if the person in the photograph does not have (or wish to create) an account. In other words, for the design to account for the person who appears in the photo, s/he must be treated as a user. Similar examples can be found in second wave HCI, *e.g.*, group calendaring succeeding by first giving each member of the group an individual motivation to become a user [41,43]. This tendency to user-ify is quite understandable. In some ways, "user" is the most (or perhaps even the only) meaningful way we have of talking about or accounting for the human(s) in human-computer interaction. If someone is not a user, why would we be talking about them, let alone designing for them?

Empowerment

The structure of the user provides important value within HCI discourse and practice. The user not only gives us a vocabulary for talking about the human elements of computing, but it also enables us to account for them in

design. Numerous central concepts within the field—user studies, user-centered design, user experience—are made possible via the rhetorical construct of the user. Furthermore, thinking about users not in the abstract but as specific individual people can allow designers to move from generalities to specificities, *i.e.*, it can facilitate the incorporation of human elements into computing design. Moreover, this impetus to user-ify resonates with our goals of empowerment; if "HCI tools and methods can be used to help the under-served, under-resourced, and under-represented," we can accomplish #chi4good¹.

Constraints

However, while the ideology of the user enables and empowers, it simultaneously limits and constrains. By providing focus and clarity with respect to users, a myopic fixation on the user limits our ability to see other configurations of interaction with computers, particularly in relationships that sit outside the bounds of what we would likely refer to as "use" [*e.g.*, 8].

The constraints imposed by the ideology of the user are enacted via multiple means. One of the most foundational questions in user-centered design, "Who are your users?" suggests that users are the (only) people in which you might be interested. To give someone meaningfully important consideration in HCI, they must first be user-ified, regardless of the appropriateness of that appellation. Documentation can enact similar constraints, providing a sort of technological paratext that prescribes the particular relationships that one can have (as well as those relationships one *should* have and should *not* have) with a computer [90]. Even physical computing hardware can be designed to invite, to discourage, or to prevent entirely alternative uses not envisioned by a designer [90].

These constraints can be overcome. Emerging threads of research and design (described further below) embody a kind of post-userism that moves beyond the ideology of the user. Nonetheless, as argued above, much of the scholarship and virtually all of the design within HCI provide limited conceptual grounding to help us account for (rather than subsume, condescend, or dismiss) relationships outside the purview of the user.

LEVELS OF REPRESENTATION

Where is a user? Put another way, where and how are the different definitions of human, computer, and interaction we described above codified and enacted? To answer this question, we must attend to how various subject positions are defined and represented relative to and within technology. We approach this representation ecologically to connote both enumerating the subject positions involved and describing the relationships among them. We argue that representations of technological subjects can be grouped into four levels [*cf.* 30]:

¹ <https://chi2016.acm.org/wp/>

The Systems Level. These representations are codified in the technical workings of a system. How do the low-level variables, data structures, database schema, etc., represent the entities, relationships, and interactions of interest? We use the systems level to talk about the types of representations that lie beyond interaction but that still shape those interactions. Arguably, gradations exist within systems representations. For instance, there may be differences between bits shifting in processor registers and the relationships among columns in database tables. These various systems representations, though, are all conceptually distinct from other levels of representation. Of particular interest to HCI, and the examples that follow, are systems approaches that represent the user—*e.g.*, authentication, user account, user data—and as a result influence possible subject positions.

The Interface Level. These representations deal with what the user(s) see and interact with. What kinds of entities, and relationships among them, are represented to user(s), and in what ways? The interface is still a part of the technical system, however, as argued further below, we should distinguish between the internal representations maintained by a computational system and the presentation of those representations to user(s).

The Design Process Level. These representations allow designers to account for user(s) or others during the design process. Who and what is represented during the design process, and in what ways? Design process representations may involve crafting personas, writing scenarios, accounting for stakeholders, etc. These may or may not translate into explicit representations at the interface or systems levels. However, the design process is often where experiences are typified, influencing system and interface representations through design requirements.

The Ideological Level. These representations function at the level of discourse within a discipline or field of study. How do we account for the various entities and relationships involved in interactions between humans and computers? Ideological representations are most common in work that discusses users—their needs, qualities, and experiences. Ideological representations are subtle: they occur when we use the term “user” to aggregate representations from the three previous levels, collapsing systems, interface, design, and lived experience. Reflexive scholarship in HCI sometimes explicitly focuses on these representations, such as the pivotal pieces across the three waves of HCI. These representations sometimes become most visible in how we narrate the work we do, both to ourselves and to others outside the field. The most common ideological representation in HCI can be seen when we equate “person” with “user.”

Across these levels, the “post” of post-userism highlights the goal of representing, accounting for, and designing for subject positions other than that of the classical user. In this way, we eschew a fully post-structuralist approach, which

would dissolve or transcend categorical boundaries entirely. We also eschew a fully post-humanist approach, which would place something other than a human being (a relationship, a non-human entity, an organization, an event, etc.) at the center of design. Essentially, such approaches would identify and attempt to transcend the limits of subjectivity as a design construct. While interesting and important possibilities, this paper focuses instead on the representation of subject positions across the four levels described above.

At the ideological level, HCI has a fairly well-developed body of work accounting for post-user subject positions [6,9,52,76]. However, those developments have not been manifest to the same degree at other levels. This paper addresses how we might go about incorporating post-userism into the design process, interface, and systems representations.

SCENARIOS AND STRATEGIES: POST-USERISM IN PRACTICE

At this point, we can return to the definitional question: What is post-userism? How might you know when you have a situation that could benefit from a post-user lens? Post-userism involves attending to representations of the ecologies of subject positions that people might occupy with respect to technology. Researchers, designers, systems architects, etc. could benefit from post-userism when they encounter breakdowns across the four levels of representation described above. As a practical strategy, post-userism does not necessarily help solve existing problems. Rather, it enables more comprehensive problem *setting* or problem *framing* [28,77,78], facilitating a design scope that encompasses greater varieties of human-computer interactions.

Here we describe instances of post-userism and what post-userism looks like in practice. To do so, this section works through a series of scenarios where we see post-userism, outlining strategies for applying a post-user lens in each. The strategies synthesize across examples, demonstrating the process of identifying how the user gets variously deployed across different levels of representation. These strategies both help define the ecology of subject positions one might want to consider and provide some guidance as to what you might do about it. As described further below, we hope this series of strategies provides a foundation upon which future work can build.

As such, this section presents a non-exhaustive typology. We neither attempt, nor are we able, to articulate and provide strategies for every situation in which the ideology of the user breakdown across levels of representation. Furthermore, not all such breakdowns can be, or should be, resolved. Instead, we offer a series of qualities that characterize subject positions in human-computer relationships beyond “use.” For each quality, we also offer a conceptual strategy that can be used to grapple with such situations. As HCI researchers and practitioners do so, they

can contribute insights they have gained toward a broader understanding of designing for an ecology of subject positions. To reiterate, an ecology in this context includes a depiction of each subject position, an enumeration of the relationships among them, and a description each's relationship to the technology interaction.

Each of the following subsections offers a quality that certain subject positions might have, along with a strategy to account for such subject positions in design. For instance, when your ecology of subject positions involves indirection, you might consider designing for delegates.

Indirection

Indirection involves cases where the person using the system does so on behalf of another. A prime example can be seen in intermediated interactions [75]. Based on ethnographic work in two urban slums in Bangalore, Sambasivan *et al.* describe cases in which surrogates act on behalf of users who, for reasons including illiteracy and limited technological abilities, cannot engage in the interaction themselves. In these cases, users interact with the system indirectly through an intermediary. As another example, some rural communities have a single household with a telephone or computer [71]. Similar situations sometimes arise in Old Order Amish communities to constrain the influence that such technologies have on the community [85]. In these cases, the householder who has telephone or Internet access acts as a relay for others. In organizational contexts, one employee, often an assistant, may schedule meetings or respond to email on behalf of another, often a supervisor [95,96] [*cf.* 32]. This work of surrogates and collaborative use can also be seen in care workers for the elderly or cognitively impaired [72]. One could also consider the navigation of airplanes or naval ships, often used as object lessons for distributed cognition [51]. A commanding officer navigates indirectly, collecting information and issuing commands through the individuals observing and operating the vessel's various instruments (compass, speedometer, steering, etc.).

In each of these cases, the concept of the user breaks down across levels of representation. Consider Sambasivan *et al.*'s [75] intermediated interaction and email systems: At the systems level, there is a single person who is authenticated and accessing their email data. At the interface level, the person who is sending and receiving those emails interacts via the intermediary, not with the technology itself. At the design level, the concepts of authentication and access codify the one-to-one correspondence between human user and user account, omitting the possibility of other configurations. At the ideological level, we might be interested in accounting both for the intermediary user and for the person on whose behalf the intermediary is functioning. However, those two subject positions are absent at other representational levels (systems, interface, design process). Similar disconnects

across levels of representation occur in the other cases mentioned above.

Delegates

One potential approach to addressing indirections involves delegates, a representation of one person (inter)acting on behalf of another. Delegates can be represented at the design process level, at the interface level, at the systems level, or at some combination thereof. Some technologies already enable such functionality. For example, enterprise software often explicitly grants permission for administrative assistants to schedule meetings for, or to respond to email correspondence on behalf of, their supervisors. Similarly, Gmail users can allow other accounts to act as their delegates². At the systems level, most Unix-based operating systems provide a command called `su` (an abbreviation for “substitute user” or “switch user”), allowing one user to execute commands as if s/he were logged in as a different user. Interestingly, these extant cases each have slightly different implementations. At the systems level, `su` actually changes who is logged in; the interface represents that Alice is acting on behalf of Bob, the system represents the actions taken simply as Bob's actions. In the case of Gmail, delegates record that certain actions are performed by Alice on behalf of Bob. The latter is probably closer to what would be required to implement delegation and resolve breakdowns across representational levels.

Thus, while delegation strategies do exist in some cases, the diversity of their implementations and implications encumbers our ability to learn from the similarities and differences among how different technologies captures these inter-personal relationships. Seeing these diverse cases through the lens of post-userism allows us to consider both what they have in common and what designers for one case might learn from other instances of indirection. For the time being, it is not surprising that simply sharing credentials remains a common strategy [59]—albeit one that works around a system that does not adequately support indirection.

Transience

In some cases, an individual can sustain multiple, repeated interactions with a system, even though the system does not maintain a persistent representation of that individual. Contrast Craigslist with Ebay or Match.com: Despite the design assumption that a given individual would post multiple ads, the service historically omitted user accounts that would link these individual interactions [19]. And while the service has subsequently added user accounts that allow authors “to post, edit, delete, and repost more easily”³, when viewed by others, these posts remain unlinked and self-contained, resulting in what Brubaker

² <https://support.google.com/mail/answer/138350?hl=en>

³ <http://www.craigslist.org/about/help/faq>

[19] has called “single use identities.” Users of Reddit similarly have an established practice of creating single-use “throw-away” accounts [65], often to post material an individual does not want associated with her or his primary account. At the design level, Reddit explicitly condones this practice⁴, despite eschewing a representation of the practice at either the interface or the systems level. Similar situations can arise with ambient displays and information kiosks. In the absence of an identification system, such as RFID badges [13,67], individual instances of interaction are not represented within the system as pertaining to a single persistent identity. To wit, the systems representation makes no distinct between different interactions by a single individual and single interactions by different individuals. While it does not necessarily introduce problems here, failing to account for transience in such situations can limit our designs.

These systems exist and function (to varying degrees of efficacy) without requiring that people who inhabit the user subject position be tied to a fixed or persistent representation. Thus, both in the design process and in technical implementation, it can be difficult to account for such recurring interactions due to the transient nature of their representation.

Flexibility

One strategy here involves adding flexibility to the representational constraints imposed at the interface and systems levels. Authenticated users are often presumed, but are not also necessary. If the central entity being represented is a user, what elements of that representation could be relaxed? Must everyone have a birthdate? A name [34,66]? A list of friends? A set of access permissions?

Facebook memorial profiles offer an example of flexibility in representations of a user [17,18]. They maintain some aspects of a typical user representation while forgoing others. For example, memorial pages have a profile photos and a list of friends, but no one can log into a memorialized account. Instead, it is managed by another account denoted as the legacy contact. Adding flexibility to the representational constraints helps account for some of the subject positions involved (e.g., mourners).

When the user is not presumed (or required) to be a persistent subject position, other design foci come to the foreground, such as activities and communication. Returning to Craigslist, the representations are post-centric rather than user-centric, focusing the design around possible interactions with posts rather than among users. This strategy does not imply that one needs less knowledge or understanding of users. Rather, it suggests that designers consider representing certain subject positions primarily (if not exclusively) in terms of their relationship to an

interaction, even if this requires a more fluid approach to what constitutes a user.

Multiplicity

A single individual may, while interacting with a computation system, inhabit multiple subject positions, either one at a time or simultaneously. In some ways, multiplicity offers an inverse to transience. Transience involves one-off interactions, where the design does not disambiguate between multiple interactions by a single person and a single interaction by each of several people. Multiplicity involves individual people creating multiple representations of themselves, satisfying the system requirements of user representations while simultaneously enacting different facets of their identities.

For example, a single individual may maintain multiple user accounts for, say, a given social media site. Motivations for doing so can vary from separating professional and personal contacts [80], to distinguishing between actions as an individual vs. actions on behalf of an organization, to negotiating gender identity transitions [44,45]. Repair work offers another example: A given individual may simultaneously act as, say, both smartphone user and repair technician [56], even though these are generally represented as two distinct subject positions.

Fluidity

One strategy to approaching a multiplicity of subject positions is to design for fluidity. As an example, Facebook does not first encode you as a parent and then allow you to take parental actions. Instead, you simply do parental things. Sociologically speaking, the status of parent is not one that you can assume strictly through your own choice. It is one that is granted because of the ways that others interact with you. Similar statements could be made about being, say, a cat lover, a librarian, a gamer, a politician, etc. Despite the fluidity with which they are defined and bestowed, these kinds of subject positions often receive rigorous, strict codification within the design process, interface, and systems representations. Designing for fluidity may help account for, if not completely resolve, breakdowns that arise from a multiplicity of subject positions.

To take the strategy of fluidity a step farther, what if social media sites, or authentication systems in general, could forgo the assumption of a one-to-one correspondence between human users and user accounts? Alternative kinds of representations—at the systems, interface, or design process levels—that give up “user” as the central entity may facilitate better accounting for fluidity among subject positions.

Absence

In some cases, interactions with a technology may embody subject positions that exist without any representation, either in the design process or in technical implementation. A prime example comes from recent work studying

⁴ <https://us.reddit.com/wiki/faq>

technology non-use [9]. As a designer, one might want to account for the ways that a system may impact people who do not directly interact with it. For example, media discourse around sites such as Facebook can readily influence those who do not have an account [2,29,73,93]. Williamson and Williamson [89] document how the presence of a pervasive display may impact those who do not interact with it, *e.g.*, by altering flows of foot traffic for those who wish to avoid the display.

Other subtler cases of absence may occur. For instance, a “smart” thermostat such as the Nest may be interacted with by multiple different householders, a fact represented in the design process. However, the Nest maintains no systems representation of these different individuals, only a representation of the house itself [94]. As another example, search queries including stereotypically African-American names (*e.g.*, Latanya or Latisha) vs. stereotypically white names (*e.g.*, Kristen or Jill) result in a higher chance of seeing advertisements that suggest the person has an arrest record [82]. Since employers often perform internet searches for the names of potential employees, a disproportionately high rate of ads suggesting a criminal history may amount to racially-based employment discrimination [7]. Much of the current discourse around these issues involves questions of responsibility, such as who should be held accountable for such computationally-enacted discrimination. Another equally important but less often considered question deals with how we might account for the person being discriminated against. While the users of services such as Google Ad Words might be seen to include the companies taking out advertisements, the individuals performing searches, or both, the person whose name is being searched occupies a different subject position.

Alternatives

One strategy for dealing with such situations involves accounting for these alternative subject positions. For instance, one might represent those who are excluded or disenfranchised from technology access [76,83,92], those who are impacted without direct interaction with a technology [93], or other subject positions in the design process. Strategies from speculative and critical design [33] may prove particularly useful in exploring such alternatives. Note that these representations need *not* persist to the interface or systems levels. As noted above, post-userism does not require resolving breakdowns across representational levels. Rather, it involves attending and designing around such breakdowns.

Hybridity

A final type of post-userism occurs when a subject position is comprised of a hybrid network of human and non-human actors. Consider a phone call to, say, customer service for your internet service provider (ISP). Rarely do you call an individual person. Rather, you are connected with an individual representative, chosen mostly at random from a

group of representatives. That individual person inhabits a subject position speaking and acting on behalf of your ISP—changing your bandwidth, completing connection or disconnection requests, resolving issues with your bill (or perhaps not). Similar subject positions arise when a mostly de-individualized person acts as the interface to a larger group or organization, such as clerks at a department of motor vehicles (DMV) office, building receptionists, citizens contacting their elected representatives, cashiers, or crowd workers.

Other kinds of hybrids involve more sophisticated computing technology. They are common in infrastructure: Geiger, for example, has detailed the cooperative relationships between editors and bots in the maintenance of Wikipedia [38–40]. However, they are increasingly entering everyday interactions. For instance, Facebook M offers a hybrid digital assistant [49]. Similar to other digital assistants, it uses a combination of natural language processing and artificial intelligence to perform tasks. However, when this automated system encounters a request it cannot handle, though, it recruits aid from a team of human Facebook employees. At the interface level, the user sees a consistent representation; users are blind to whether they are interacting with a human, a machine, or some combination thereof. A similar although less seamless example can be seen in phone-based customer service systems that use voice recognition for fairly rote tasks but then fall back to human operators for more complex processes.

Assemblages

These kinds of scenarios highlight the influence of post-humanist thinking [30,62,64]. Attending to hybridity allows us to acknowledge the kinds of agency and statuses that non-human entities may have [55]. Some work in HCI has even suggested studying animal-computer interaction and the ways that computers may mediate the relationships between pets and their owners [68,70].

The goal here is not to claim that we need to account for or design for the subject position of a hybrid digital assistant, a cat using an iPad [68], or a crowd worker. While doing so may be important, we aim instead to elucidate the particular kinds of subject positions that people take *in relation to* those hybrid assemblages. Subject positions are always constituted relationally. By acknowledging both the kinds of human/non-human hybrids with which people interact and the differences in those hybrids across different representational levels, we can begin to design for the subject positions taken in relation to such assemblages.

TWO PATHS FORWARD

Based on the critiques and alternatives presented in this paper, we suggest two primary paths forward:

1. To examine the kinds of relationships that are occurring in HCI, but that are under-accounted.

2. To begin to explore what HCI might look like in the absence of the traditional user.

Although this paper focuses primarily on the former, this section considers the differing shape that each direction might take in the evolution of the field.

Research and Design Beyond the User

First, post-userism provides a way for HCI to move toward a more comprehensive account of the relationships that occur between humans and computers. In our description of post-user scenarios, we intentionally focused on how research findings and design challenges were connected to larger conceptual issues with the user. Practically, one of the most productive strategies should involve identifying how others have managed similar post-user scenarios. Currently our ability to do this is limited and labor intensive.

HCI is exemplary in identifying limitations of existing systems, both in their practical usage and in the design work behind their development. However, relatively little work connects limitations arising from our conceptualization of the user with design work that addresses those limitations.

This situation stems in part from HCI's pragmatic tendency to focus on specific domains. For example, while doctors acting on behalf of their patients when managing medical records is certainly a form of *indirection*, design interventions based on such an observation will likely be limited to medical informatics as a domain. However, there are certainly connections between this case and others, such as intermediary users observed in an ICTD context [75]. This similarity offers but one example. More generally, relationships within ecologies of subject positions have commonalities, but those commonalities are difficult to connect across different domains within HCI. It is for this reason that we intentionally drew on examples from multiple domains to demonstrate how the structure of the user causes problems across many different application areas.

Scholarship that makes use of the practical strategies we have enumerated would benefit the community by explicitly sharing:

- How did we, as researchers or as designers, realize we were facing a post-user scenario?
- What were the relevant subject positions in our scenario?
- What were the relationships among them?
- How did we represent that ecology of subject positions and their relationships across different levels in our design?
- What were the repercussions of the representations we used?

While much of the work in HCI implicitly does the above, it does so while presuming the centrality of the user. Rather

than suggest that we start ignoring the user, post-userism encourages HCI researchers and practitioners to look beyond the user for the additional subjects and relationships to which the primacy of the user can blind us. Explicitly addressing the above questions will help scholars and practitioners make use of a post-userist lens beyond the ideological level and engage levels of representation more directly pertinent to design, problem setting [28,77,78], and technical implementation.

In Absence of the User

The second path forward asks that we explore what HCI might look like in the absence of the traditional user. User as a construct runs into trouble because it both feeds into and is a product of the idea that we are designing with the human at the center. Post-userism serves to question what our field places at the center of its practices. What are the types of actors, entities, and concepts around which we can center?

We have seen efforts to broaden HCI's scope. Terms like "human-centered computing" and "human centered design," however, are often clever slights of hand. They acknowledge the limitations of the user (particularly as conceptualized in first wave), and adopt a more holistic alternative: "human." Yet in practice, we very quickly revert to making the human a user. This is particularly true in how we represent people at the systems and interface levels, where the human must be represented as a computational entity [19].

An alternative can be reached when we start to acknowledge HCI's user as a modernist and structuralist project. The user gives HCI a common foundation—a "person" to design for—but one that limits us as well. As others have suggested [84], we might instead think of design—and especially "interaction"—as a set of relational practices. The "user" captures a set of relationships and provides a framework through which practices are constructed. However, this framework, we have argued, by no means captures all relationships.

CONCLUSION

In this paper we introduced post-userism, a critique of HCI's focus on the "user." We have argued that HCI conceptualizes humans as users in how it designs and researches interactions. "User-ifying" people presents two challenges: first, it reduces the person into a construct that is not able to handle the complexity of human experience, and second, places a burden on this construct to account for the entirety of what is "human" in human-computer interaction.

A post-userist approach, then, accomplishes two things: First, by highlighting the limitations of "user," post-userism provides a means to identify and address types of interactions for which the construct of user cannot account and, as a result, ways the user limits us in our design and research practices. Second, by challenging the construct of

the user itself, post-userism encourages us to explore what HCI might look like in the absence of a traditional user. Put differently, does the field need better ways to engage and design for the “human” in HCI, or do the blurred lines between human and computer [47] suggest that other actors [63] might be legitimate sites on which to focus our research and design practices? Ultimately, this paper aims to support such conversations about the center around which our discipline is organized.

ACKNOWLEDGMENTS

We would like to thank Ellie Harmon, Brian Keegan, William Aspray, Ethan Hanner, Alex Taylor, and our anonymous reviewers for their generous feedback. This work was supported by NSF Grant #IIS-1110932 and by the Intel Science and Technology Center for Social Computing. This piece was largely authored while the first author was affiliated with Cornell University.

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