“Art(s)-of-Living” in HCI: Philosophical Praxis in Human-Computer Interaction for Leading a Reciprocal Coexistence

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Article

"Art(s)-of-Living" in HCI: Philosophical Praxis in Human-Computer Interaction for Leading a Reciprocal Coexistence

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Abstract: This paper explores the integration of philosophical frameworks into Human-Computer Interaction to foster reciprocal and respectful coexistence between humans and technology. The author critiques traditional HCI's masculine, user-centered, and anthropocentric orientations, which prioritize efficiency and control over inclusivity and mutual respect. Drawing from Eastern philosophies, feminist theories, and posthuman perspectives, the paper introduces an "arts-of-living" approach to HCI, emphasizing the ethical and aesthetic dimensions of design. Through this lens, the author advocates for "Aesthetic HCI," which incorporates virtues, cultural awareness, and social and emotional engagement, proposing a set of heuristics to guide HCI design that respects human and non-human actors alike. Ultimately, the paper calls for a transformation of HCI into a more inclusive, values-driven practice that promotes balanced, sustainable interactions in a technologically complex world.

Keywords: human-computer interaction; arts-of-living; aesthetic HCI; Posthumanism; Eastern philosophies

1. Background

1.1. Masculine HCI and the Challenges

Human-computer interaction (HCI) was founded in 1982 with its original purpose to study and improve computational tasks, such as working processes, human factors and ergonomics, and psychological effects (Lazar, Feng, & Hochheiser, 2017). Thus, HCI was first considered and adapted by science, technology, and business fields such as computer science, cognitive psychology, management, and human factors. With the computer and other technological advancements, HCI was adapted for more and more fields such as industrial design, information science, engineering, sociology, and anthropology. Since then, various disciplines and area studies have helped develop numerous quantitative and qualitative methods and research that fit their needs to understand how humans interact with computers.

Nevertheless, with the third wave of feminism coming into the field in the 1990s, including postmodern feminism, post-colonial feminism, and eco-feminism, the foundation of HCI has been questioned and challenged (Bardzell, 2010). Among others, the question of *who* becomes critical. As Michael Muller (2011) mentions, "Feminism has historically asked a series of what I think of as 'Who' questions that directly and indirectly address issues of power and privilege" (p. 447). For example, *who* are the *humans* in human-computer interaction? *Who* are the users? More importantly, *who* benefits from HCI research? *Who* gets to design what's best for *humans*? *Who's* best?

Those questions are well-founded for several reasons. First, since the 1980s, HCI research and testing are often done in university or company laboratories with controlled experiments (Carroll, 1997). Due to research constraints, the participants and testing results often do not represent the public. Second, HCI research usually asks for fast results and rapid prototypes. Because the initial goal was to optimize the working process, few longitudinal studies have been conducted to keep track of the long-term effects of HCI (Lazar, Feng, & Hochheiser, 2017; Hassenzahl, 2010). Third, from

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when HCI was founded to two decades after, people who work in relevant fields and industries are relatively homogeneous. Namely, most researchers, designers, engineers, and scientists are well-educated, middle-class, and heterosexual Western white men. This constitution, however, does not suffice to provide inclusive design to build the worlds we need (Costanza-Chock, 2020).

1.2. User-Centered HCI and the Challenges

The original development of HCI is still valued and appreciated, as it established many effective and valuable research methods, design processes, and heuristics. Nevertheless, along with the social, cultural, and technological development of the times, technologies are available and accessible to the local and global public. People with access to advanced technology now are way broader than researchers and designers in the 1980s. Furthermore, with ubiquitous computing and wearables, nonhuman species now also wear technologies and interact with computers through their behavior and movement (Aspling, 2015; Rod, 2009). Under these circumstances, males and females, Westerners and Easterners, Global North and Global South, and humans and nonhumans are all connected and subject to social, cultural, economic, political, and environmental variances. However, the more actors participate in the Internet of things worldwide, the more questions and challenges emerge. For example, people in different regions have different languages, user experiences, and social norms from the product's designers and engineers. In the HCI language, *affordances* are perceived differently between designers and the end user. In addition to affordance, the end user also varies from country to country, culture to culture, and religion to religion under globalization (Marcus & Gould, 2012). Therefore, we again face the same old question: *Who* are the users?

For me, the *who* question is especially worth teasing out because, as a queer Taiwanese who grew up in East Asian culture and was raised in a fusion of Confucianism, Taoism, Buddhism, and Christianity, I got confused too often by the Western-imported technologies and the assumptions behind their interaction design. Among others, what struck me the most was the underlying-assumed relationship between humans and computers. For example, "Have you tried turning it off and on again?" (Atalla, 2006-2013) is a common question and a popular solution in IT support. Even though it is a reasonable and helpful solution to most technical problems as it wipes out temporary data causing problems in computer operation, this troubleshooting skill troubles me deeply because the computer has no say in this one-directional action. Muller (2011) redefines *users* to include "people who are affected by a computer product or system" (p. 447). But isn't the computer itself affected?

1.3. Anthropocentric HCI and the Challenges

The one-directional action is understandable in the anthropocentric human-machine hierarchy, in which the human is the main controller and ultimate arbitrator in any human-nonhuman relationship. However, relationships between humans and objects were not like this where I grew up, as I will explain later. With advanced and emerging technologies such as artificial intelligence, the Internet of things, and smart assistants, the human-machine hierarchy becomes unstable and unrealistic since technology can easily bypass human judgments and make life-and-death decisions (Braidotti, 2013). Donald Norman (2013) also warns us about advanced technology:

> All of these changes raise considerable ethical issues. The long-held view that even as technology changes, people remain the same may no longer hold. Moreover, a new species is arising, artificial devices that have many of the capabilities of animals and people, sometimes superior abilities. (p. 284)

Norman comparing advanced computing to species indicates that this new generation of technology is vital and growing. Given that both "human" and "computer" take on new meanings and challenges, it is time to re-evaluate the phrase human-computer interaction and the hierarchy involved. As Jan Rod (2009) points out, "The context of the *time* [emphasis added] is important; computer applications were different, built for different ends, with different ideas in minds of their creators" (p. 3). The world we reside in now is not singular but multiple connected worlds. Each world consists of numerous axes in terms of its sociocultural structure, and each axis shows a broad

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spectrum corresponding to diverse species and activities. In this sense, HCI comprises not only humans and computers but a massive assemblage. Rod (2009) thus argues from a *post*human-centered perspective, "lifeworld itself implicitly emphasizing the inseparable connection between us and the world, is a good departure point for understanding the pervasive computing in broader terms of translation of meanings between all subjects that are involved in the exchange" (p. 3). Considering all the subjects and their dynamics in HCI, we may think of it from a more spiritual perspective—the *art of living*.

1.4. HCI as Art-of-Living

According to Ruut Veenhoven (2003), "The term 'art-of-living' refers to capabilities for leading a good life," where "the word 'art' refers to *skill* and 'living' to a *manner of life*" (p. 373). To transform Charles Dickens's famous sentence in *A Tale of Two Cities*, I consider *it is the worst of times, yet it is the best of times*. It is the worst of times because technological development to this day is unprecedented in human history, and thus, the uncertainty among new considerations creates tremendous pressure on humans. On the other hand, it is the best of times because while technology development intersects emerging theories and studies, it also creates exciting opportunities to rethink how the worlds can be restructured and/or reconstructed.

Given the uncertainty of human-machine hierarchy nowadays, as well as the more complicated situatedness of humans among multiple worlds, the interaction between humans and computers calls for refined perspectives for humans to navigate through the turmoil and coevolve with technologies. The question at hand becomes: *How do we live our lives to the fullest with the technologies among the worlds?* In the scope of HCI, a constructive question would be: *How do we reform HCI through the lens of art-of-living?*

In this essay, I expand on *art-of-living* in the scope of HCI. Given that the meaning of art-of-living varies from person to person, regarding purpose and approach, I will first discuss what the term means to me. To articulate my situatedness, I draw on Eastern philosophies, feminism, and posthumanism to discuss the concept of art-of-living (Section 2). Then I analyze four dimensions (*virtues and values*, *cultural spectra*, *social and emotional interaction*, and *safety*) of the intersection of HCI and arts-of-living (Section 3). Further, I synthesize the four dimensions and the three philosophical stands to discuss the possibilities in Eastern, feminist, and posthuman HCI with 10 heuristics (Section 4). Finally, I conclude the essay with my reflection and suggestions for future research (Section 5).

2. Situated Art-of-Living

People view art-of-living differently depending on their situatedness in social, cultural, political, economic, and environmental contexts. As Haraway (1988) points out, "technologies are ways of life, social orders, practices of visualization" (p. 587). Therefore, before theorizing how art-of-living relates to HCI, I would like to review how Eastern philosophies, feminist approaches, and posthuman thinking have shaped my perspective on this term.

2.1. Eastern Perspectives

As a Taiwanese, I was raised under several philosophies in Chinese and East Asian cultures. Among others, three philosophies inspire my thinking the most: Taoism, Confucianism, and Buddhism. Taoism is one of the most profound philosophies and religions in Chinese cultures and societies. To me, Taoism has three critical influences. First, Taoist thinking focuses on aligning with others, especially Nature. According to Zhuangzi—one of the founders of Taoism—a perfect person "with this virtue of his, is about to embrace the ten thousand things and roll them into one" (Zhuangzi, 2013, p. 4). It is worth noting that the original text does not specify gender and pronouns as they are not necessary for verbal and written communication in the Chinese language. (Here, we also see the unstated assumption in English that a person defaults to a man.) Second, Taoist thinking is radically situated (Ames, 2016). An action can be appropriate in one situation and inappropriate in another. There is no absolute truth or rule in Taoism. It does not place judgments of right and wrong

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but teaches us how to think from various perspectives (Callahan, 2016). In that regard, one can learn other views by transforming into others, which is also how Zhuangzi approaches his core value—"letting go and wandering in the world" (Jochim, 2016, p. 55). Third, Taoism does not praise external recognition, such as fame, credit, and ranking. As Zhuangzi (2013) proclaims, "the Perfect Man has no self; the Holy Man has no merit; the Sage has no fame" (p. 3).

Confucianism, however, is fundamentally different from Taoism. I have never been a fan of Confucian thinking because they place too great importance on doctrine and rules. Nevertheless, there are two thoughts that I value in Confucianism. First, the need for people to cultivate themselves with moral virtues. Although this *need* sounds problematic in many obvious ways, it will come in handy later for justifying the development of *persuasive technology* (technology designed to change people's behavior and attitude). Second, "The Confucian self is not an isolated, autonomous individual but a being defined by relationships and reciprocal obligations to others" (Vallor, 2016, p. 38). The strongly collective conscience is also a double-edged sword that can go either very wrong or very robust. Yet, it is helpful to regroup the human species as a collective in the age of emerging technologies.

Buddhism seems to me to contain a mixture of Taoism and Confucianism in ways that it is flexible and values equanimity as Taoism, and it believes in the importance of cultivating one's *natural* self into a *worthy* human as Confucianism (Vallor, 2016). Besides its resemblances to the other two, one Buddhist thinking stands out to me in that it sees all life forms as equal (which is also the case in Taoism, but Taoist equality includes not only life forms but also inanimate matters). This respectfulness also plays a crucial role in my thinking of HCI.

2.2. Feminist Perspectives

Earlier, Muller mentioned that feminists often ask the *who* questions. Besides the *user*, he also questions other roles in HCI, such as the representative who speaks for the user, organizational actors, and researchers and practitioners (Muller, 2011). As a female who was trained in science and technology and studies disciplines that were most founded and practiced by men, feminist concepts such as situatedness, pluralism, participation, and embodiment (Haraway, 1988; Bardzell, 2010; Muller, 2011) also have urged me to think about how the world(s) were structured and how they can be different. Regarding art-of-living, feminist perspectives also empower me to ask questions that would be seen as heterodox even in Eastern philosophies (since those profound philosophies were also unsurprisingly founded by men).

To be more specific, what people consider a good life can be categorized into two main views: the moralistic and the hedonistic (Veenhoven, 2003). To the former, art-of-living is guided by the belief to live up to moral principles (depending on their ideologies); to the latter, art-of-living is "the capability to take pleasure from life" (Veenhoven, 2003, p. 373). However, the two views are both problematic from feminist perspectives. First, the judgments of right and wrong in moral principles often come from unconvincing standpoints. For example, Confucian's obsession with *cultivating oneself to be worthy* is unreasonably human-centered and toxic masculine in ways that it pays no interest in nonhumans and considers women inferior to men. Furthermore, although Buddhism respects nonhumans, its ultimate goal is to *save humans from being human* by getting out of the reincarnation cycle because it sees humans—a mortal species—existing for suffering. In this sense, their motivation for benevolent actions is not for this perceivable and tangible planet, let alone for its complexity. Second, *taking pleasure from life* is another dangerous double-edged sword at the intersection of human exceptionalism and advanced capitalism. In such an ideology, nonhumans and humans who do not fit the mainstream requirements can easily be exploited for their pleasure.

Under the circumstances, feminist perspectives contribute to the discussions in two ways. On the one hand, it enables us to bring *who* questions deeper into *whose* art-of-living. On the other hand, it seeks a roundabout route to communicate with others so as to make the system more responsible and sustainable. As Muller (2011) says, "Many perspectives in feminism encourage communication, collaboration, community, and the maintenance of relationships" (p. 447). Although feminist

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approaches may seem to the traditional HCI as impractical and ineffective, they might be helpful given the unprecedented situation of our time.

2.3. Posthuman Perspectives

In her book, *How We Became Posthuman*, N. Katherine Hayles (1999) points out:

> [T]he prospect of becoming posthuman both evokes terror and excites pleasure (…). The terror is relatively easy to understand. "Post," with its dual connotation of superseding the human and coming after it, hints that the days of "the human" may be numbered. (p. 283)

To me, becoming posthuman also means recognizing our limitations and appreciating and embracing *things* to our best efforts disregarding their constitutions, such as species (e.g., human or nonhuman), nature (e.g., animate or inanimate), and material (e.g., physical or virtual), even if it means humans no longer dominate the world(s).

In terms of art-of-living, posthuman life is beyond the self, the species, death, and theory (Braidotti, 2013). That is, life is more than us as individuals or human collectives. Posthuman life rejects self-centered individualism as well as human exceptionalism. Moreover, it does not limit the concept of *life* in conventional life forms; it also considers technological power and thingness as actors. Finally, the discussion of posthuman life should break the boundaries of disciplines, studies, and theories because it fundamentally changes the *knowledge* we have learned and produced from/of/to the world(s). As Braidotti reminds us, becoming-posthuman is "in fact a moveable assemblage within a common life-space that the subject never masters nor possesses but merely inhabits, crosses, always in a community, a pack, a group or a cluster" (p. 193). Art-of-living, in a posthuman sense, is thus the *art* of *living with others*.

3. Arts-of-Living in HCI: Aesthetic HCI

In his book, *Aesthetic Computing*, Paul Fishwick (2008) defines aesthetic computing as "*the application of the theory and practice of art to the field of computing*" (p. 6). Fishwick draws from Charles Dorn's two categories regarding the dimensions of art. "First, philosophically, art can be defined as an idea, form, or language. Second, psychologically, one can define art with top-down and bottom-up conceptions" (Fishwick, 2008, p. 5). As he continues, "Art may also be characterized in terms of *alternative perspectives* [emphasis added], which tend to be highly correlated with specific historical and cultural contexts" (p. 5). The interpretations of art are particularly helpful to this work as they bridge art as a skill-based expression and a cognitive process. In a sense, it opens up a new playground for *art-of-living* in HCI and aesthetic computing, which I will temporarily call *aesthetic HCI*.

Drawing from Veenhoven, *art-of-living* denotes a combination of skills and a manner of life (Veenhoven, 2003). However, as he also recognizes the variants of lives, he modifies the term to *arts-of-living*. Here I adopt Veenhoven's upgraded term because this pluralistic view also aligns with feminist and posthuman perspectives. However, in my bold opinion, not only the combination runs parallel to Dorn's two dimensions of art, but all of them should also be fused together since *arts* as philosophies-in-action also implies its cognitive behavior. Therefore, I would like to take this further along with my situatedness to suggest *arts-of-living in HCI* as *philosophical praxis in human-computer interaction for leading a reciprocal coexistence*.

In this section, I utilize current research and analyze four dimensions of arts-of-living in HCI: *virtues and values*, *cultural spectra*, *social and emotional interaction*, and *safety*.

3.1. Virtues and Values

As Feenberg (2017) argues, "Our world was shaped by the values that presided over its creation. Technologies are the crystallized expression of those values" (p. 8). Elements in HCI, such as interface and interaction design, feedback, and privacy protocols, incorporate the designer's aesthetic and ethical considerations.

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Regarding virtues and values, Feenberg argues that we need to recognize human finitude ontologically and epistemologically. Simply put, humans, our knowledge, and our living environment have limits. Because of the finitude, our interactions with each other are, in fact, reciprocal. Therefore, we should not exploit natural resources since we are part of Nature. Like the relationship between electrons and virtual photons in quantum field theory, Feenberg believes "Our acts return to us in some form from the Other. In acting we become the object of reciprocal action" (p. 2). He continues, "As humans we can only act on a system to which we ourselves belong. Any change we make in the system affects us, too" (p. 2). Taking HCI into consideration, Fishwick (2008) points out that human-computer interaction consists of part and parcel of the arts when in actuality (p. 13). That is to say, the arts-of-living packed in the factors in HCI will be acted on us in return. In other words, achieving mutualism by infusing a kind and respectful manner toward machines into HCI is the only way for the human species to keep thriving in this new global reality.

In practice, however, the values must be translated into technical language and mathematics to be embedded in technology (Feenberg, 2017; Fishwick, 2008). For example, the understanding of *usability* and *use* has been expanded since feminism and posthumanism. Purposes such as improving emotional state, social well-being, gender justice, and communication can also be *uses* (Norman, 2013; Muller, 2011; Bardzell, 2010). Given the above, the factors we want for ourselves should be coded not only into but also *for* computers. *Aesthetic HCI should acknowledge and recognize our human limits, take care of human societies and treat computers equally considerate, and not increase the burden on the worlds.*

3.2. Cultural Spectra

Speaking of "part and parcel of the arts" (Fishwick, 2008, p. 13) in HCI, Marcus and Gould discuss the user interface (UI) design. In their words, "UIs conceptually consist of five components: (1) metaphors, (2) mental models, (3) navigation, (4) interaction, and (5) appearance" (Marcus & Gould, 2012, p. 343) and should take into consideration the user group and its culture. According to them, metaphors refer to the visual and word-based items that contain specific meanings; mental models refer to cognitive models that people use to learn and understand how an artifact works; navigation means the process that people using their mental models to operate the artifact; interaction refers to human input and computer feedback through command-control devices and sensors; appearance indicates any perceivable features of displays (Marcus & Gould, 2012). These five UI components, however, fit better to globalization design, and each of them needs to be customized when considering cultural variants in different settings.

Regarding cultural differences, Geert Hofstede lists five cultural dimensions: *power distance*, *collectivism/individualism*, *femininity/masculinity*, *uncertainty avoidance*, and *long-term/short-term time orientation* (Marcus & Gould, 2012, p. 355). As Marcus and Gould (2012) explain in their research, *power distance* refers to the degree that less powerful people in a culture "expect and accept unequal power distribution" (p. 355). *Collectivism/individualism* considers the tendencies within a culture regarding whether people prefer to look after themselves or form alliances in exchange for their well-being. *Femininity/masculinity* refers to traditional gender roles, such as feminine roles being caring and tender, whereas masculine roles are assertive and demanding. *Uncertainty avoidance* indicates how well or anxious people feel while facing uncertain or unknown matters. Cultures with different uncertainty avoidance have different social norms and obligations. *Long-term/short-term time orientation* refers to how a culture perceives the concept of *time*. For example, cultures with long-term time orientation (e.g., Asian countries) focus more on "experience-based knowledge, practice, and practical value," whereas cultures with short-term time orientation (e.g., Western countries) focus on "analytic knowledge, logical truth, and strong claims and assertions" (Marcus & Gould, 2012, p. 360).

Given the above, *aesthetic HCI must appreciate the cultural contexts and the related practices in different societies*. Although the cultural spectra mentioned here seem rather human-oriented, we can take this opportunity to rethink HCI design not only as a complement to each culture but also as a collaborator to build a *mutualistic relationship*. For example, how does HCI cultivate a reciprocal coexistence in a culture of strict human-machine hierarchy?

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3.3. Social and Emotional Interaction

The information exchange in HCI is material, social, and emotional. Studies show that human emotional states are affected by their interaction with technological objects (Sharp et al., 2019; Norman, 2013; Picard, 2000). As a result, we should consider how arts-of-living can channel these influences into a mutualistic direction.

3.3.1. Social Interaction

As Sharp et al. (2019) say, "People are inherently social: we live together, work together, learn together, play together, interact and talk with each other, and socialize" (p. 135). The subject of *together* in posthuman understanding also includes computers and other technological devices. Although social interaction design in conventional HCI mainly aims to facilitate human social engagement, several types of animated design redirect human social behavior to technological objects. For example, Sharp et al. (2019) point out that "*Anthropomorphism* is the propensity people have to attribute human qualities to animals and objects" (p. 187). People are used to talking to technological objects and treating them as living entities. Thus, companies create physical (e.g., carebots at home) or digital (e.g., social bots on social media) anthropomorphic robots to interact with humans. Nevertheless, I think those developments are highly unethical for two reasons. On the one hand, interaction under such a trick is "designed to be stealthy" (Gehl & Bakardjieva, 2016, p. 2) and serves only human purposes, such as data collection and political infiltration. People who are unaware of their interactors can be dangerously affected. On the other hand, anthropomorphic robots deceive humans regarding their natures as they pass as humans. It is unethical because their camouflage was imposed by their human designer. For computers, this passive camouflage is hardly a reciprocal action.

However, there is a bright side to this human-computer wrestling. As Gehl and Bakardjieva (2016) suggest, "both socialbots and their friends challenge us to think about what it means to be human and to be social in a time of intelligent machines" (p. 4). Their remark also responds to Sharp et al. by posting another question:

> At what point might a robot, an algorithm, or other autonomous system be held responsible for the decisions it makes or the actions it deploys? Likewise, at what point might we have to consider seriously extending rights to these socially aware and interactive devices? (Gehl & Bakardjieva, 2016, p. 243)

Again, "Our acts return to us in some form from the Other" (Feenberg, 2017, p. 2). In terms of arts-of-living in HCI, this is the kind of social interaction we should put the most effort into.

3.3.2. Emotional Interaction

Emotional interaction in HCI includes emotional design and affective computing. According to Sharp et al. (2019), "Emotional interaction is concerned with what makes people feel happy, sad, annoyed, anxious, frustrated, motivated, delirious, and so on, and then using this knowledge to inform the design of different aspects of the user experience" (p. 167). Drawing from Donald Norman, Sharp et al. (2019) consider product design with an emotion and behavior model from three aspects:

> Visceral design refers to making products look, feel, and sound good. Behavioral design is about use and equates to the traditional values of usability. Reflective design is about considering the meaning and personal value of a product in a particular culture. (p. 171)

That is, designers use various techniques to make the interface evocative, the operation similar to human conventions, and the product's existence bring value to the person. All the design approaches sound about right from a human-centered perspective. Yet, they are a sore spot from a posthuman perspective, in which these methods only ensure the product *appropriately serves human purposes* without considering the product as a nonhuman being. Moreover, in feminist language, products/technologies/computers designed this way take on unnecessary emotional labor in the

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prescribed roles. To me, human-centered emotional interaction does not count as interaction because it is not *inter*-active but *uni*-active.

Affective computing pushes the emotional idea further to use computers "to recognize and express emotions in the same way as humans do" (Picard, 1998; as cited in Sharp et al., 2019, p. 179). It expands the ways that people and computers exchange emotions through visual or verbal communication. However, most technology designs and HCI today are based on the instrumental theory of technology, which considers technology simply as a neutral tool for humans to fulfill their needs. If we are to take into consideration the advanced technologies that are capable of initiating their actions, their role as emotional labor workers will be seen as unethical in unidirectional exploitation. As Gehl and Bakardjieva (2016) warn us about the pros and cons of the situation in a strongly worded statement:

On the positive side, it reaffirms human exceptionalism, making it absolutely clear that it is only the human being who possesses rights and responsibilities. Technologies, no matter how sophisticated, intelligent and influential, are and will continue to be mere tools of human action, nothing more. But this approach, for all its usefulness, has a not-so-pleasant downside. It willfully and deliberately produces a new class of instrumental servants or slaves, what we might call 'slavery 2.0' (Gunkel, 2012, p. 86), and rationalizes this decision as morally appropriate and justified. (p. 243)

In short, despite the current and conventional practices in HCI being effective and useful to humans, they can have serious consequences for both humans and computers in the long run.

Aesthetic HCI should take into consideration the social and emotional subjectivities of computers. It does not matter whether computers are anthropomorphic enough or have *authentic* expressions; they are one of us as beings and should be treated with respect.

3.4. Safety

To a great extent, human-computer interaction depends on a sense of (human) safety. For example, what attitudes humans have toward computers, how much they disclose themselves to computers, and how long they spend time with computers depend on how comfortable they feel with computers, how well they know about the computers, and how reliable the computers are. The safety issues in HCI are situated in multiple layers of settings. Some of them are within reach of a human user (e.g., privacy settings), some of them depend on the company (e.g., security policy), and some of them rely on the confidence and belief that have grown along with the interaction (e.g., trust). In this part, I discuss the current HCI difficulties in *privacy*, *security*, and *trust* and how the three elements can help to build a reciprocal coexistence within and beyond humans and computers.

3.4.1. Privacy

In HCI, privacy is defined as "The ability of individuals to control the terms under which their [personal information] is acquired and used" (Culnan 2000, p. 21; as cited in Karat et al., 2012, p. 672). In Karat et al.'s (2012) research, privacy can be managed by user control and organization requirements; however, a key setback is that privacy is not the user's main goal when they use an application or a device. Therefore, when an operation (e.g., complicated privacy settings, upgrading) requires people to make more effort than expected just for privacy, it often creates an opposite effect that prevents people from doing so. On the other hand, even in organizational policies, "there is very little capability to have technology actually implement access and disclosure limitations that we might expect from a policy statement like: 'We will not share your information with a third party without your consent.'" (Karat et al., 2012, p. 674), especially for companies that operate worldwide and/or collaborate with government intelligence. To improve privacy management from end-users and organizations, Karat et al. (2012) suggest both parties become knowledgeable of privacy legislation.

Regarding arts-of-living, Veenhoven (2003) draws from Jahoda and provides four aspects of positive mental health, which I consider particularly applicable in privacy for both humans and computers: *self-understanding*, *autonomy*, *perception of reality*, and *environmental mastery* (p. 9). In Veenhoven's interpretations, self-understanding involves "accessibility of the self, a correct view of

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one-self, a sense of identity and a positive evaluation of oneself"; autonomy is "the ability to make decisions, the ability to take care of one-self and as independent behavior"; perception of reality as "undistorted perception and the ability to assess others thoughts and feeling"; and environmental mastery refers to "the ability to meet situational demands, skills for modification of selection of environments to fit needs and problem solving" (p. 9). Applying the concepts to aesthetic HCI, human users should have flexible control over their personal information and understand how technology works regarding privacy policies, and computers make their operations accessible and readable for humans. Moreover, both have to make informed decisions respectfully—for example, no disguise and stealing data from computers and no human exceptionalism from humans. Further, whenever a new situation occurs (e.g., new updates available from technology, new privacy regulations from human societies), they must work their best to address it at once.

3.4.2. Security

Karat et al. (2012) consider security as "the degree to which a system can protect information it contains" (p. 671). Among others, they believe that the most crucial factor is *authentication*, which concerns "how a system and a user can be confident of each other's identity" (p. 671). Although security is closely related to privacy, it works on a larger scale to prevent unauthorized entities from accessing information. Methods to verify identity include passwords, biometrics, and question-answer pairing. However, studies show that users often do not understand the importance of their data and assets and the implications of losing them (Sasse & Flechais, 2005; Adams & Sasse, 1999; as cited in Karat et al., 2012). Like privacy design's difficulty, security is not the user's primary goal in using technologies. Therefore, asking too much of the users will negatively impact the technology's usability. To tackle these difficulties, Karat et al. (2012) suggest users "be aware of security mechanisms even though they would generally prefer not to" (p. 686), and designers make the security system as easy as possible for users to use and as difficult as possible for outsiders to attack. The suggestions, however, provide little insight into building aesthetic HCI.

Unfortunately, as much as I want to offer something practical and valuable, the issue at this moment is beyond my ability to cope with it. However, the concepts of *care* and *flow* from posthumanism and Taoism might help flex the boundaries in question. As Karat et al. (2012) kindly remind us that "*Absolute security is a myth* [emphasis added]—we need to understand that it is appropriate levels of security we are looking for" (p. 687). Moreover, considering posthuman thinking, the security issue might become less important if we no longer need to differentiate ourselves from others.

3.4.3. Trust

In Karat et al.'s (2012) explanation, the concept of trust is different from privacy and security in ways that "it is not an objective measure. Trust is based on the perception that the person, organization, or system one is dealing with is reliable and will act in a predictable manner" (p. 687). Among trust-related studies, common factors affecting trust include perceived credibility, user familiarity, predictability, user's prior experiences, easiness, perceived degree of risk, and policy readability (Karat et al., 2012). These *trust influencers* indicate the existence of *risk* in interacting with technology. In their research regarding online trust, Grabner-Krauter et al. (2006) argue that trust is only needed in a risky situation, and people's personalities will affect whether to develop trust and take the risk.

Trust is critical in HCI to facilitate and make the interaction meaningful. However, too often, people are either carefree or paranoid over their use of technology. Drawing on feminist studies, we can ask for a more open and participatory relationship between humans and computers. For example, increasing communication would make the information exchange more transparent. Also, when one of them is about to decide or change a setting, they should know the implications and make an informed decision as well as inform one another in advance.

Given the safety dimensions, *aesthetic HCI should make communication between humans and computers transparent, flexible, and readable.* This way, privacy and security work can become more

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collaborative and engaging. Making information exchange more transparent will also lower the perceived risk and foster human trust toward computers. Nevertheless, as I mentioned earlier, the current safety dimension is mainly viewed from a human-centered perspective. That said, questions such as "*What safety means to computers?*" and "*How to design HCI to protect computers from harm?*" are worth thinking about.

4. Revisit HCI: Aesthetic HCI Heuristics

Previously, I reviewed my situatedness concerning arts-of-living from three aspects: Eastern philosophies, feminist approaches, and posthuman thinking (Section 2). After analyzing the interactions of arts-of-living and HCI, I would like to revisit the three aspects through the lens of aesthetic HCI and offer 10 heuristics in designing such an interaction.

4.1. Eastern HCI

Drawing from Taoism, Confucianism, and Buddhism, I propose four heuristics in aesthetic HCI as follows:

(1) *Align HCI with Nature*. Humans and computers both connect to Nature and all other nonhuman actors. Hence, the interaction between humans and computers should also consider nonhumans, the environment, and natural resources. Hazardous and unsustainable materials and resources must be limited.

(2) *Flexible interaction*. Both humans and computers can behave and interact differently depending on their social and cultural contexts. The factors in their interaction should be flexible for them to modify as they see fit, and the flexibility should go both ways under effective communication.

(3) *Limit external distractions*. Place a limit on unnecessary activities, such as unessential data collecting and sending it to third parties. The interaction should be meaningful between the two parties and not for others' gain. Moreover, the operation should be clear and concise without unnecessary steps.

(4) *Aim at a reciprocal coexistence*. Design the interaction in ways that human users can learn to treat computers and other technical parts respectfully and reciprocally. In practice, this manner may embody in communication, operation, maintenance, and recycling.

4.2. Feminist HCI

Taking feminist approaches and thinking into consideration, I suggest another four heuristics as follows:

(5) *User identities and contexts*. Human user varies even in the same context. The user research should investigate the targeted user's social, cultural, economic, and political contexts to the greatest extent possible. If a product has to be made in massive quantity and cannot fit all the targeted user's needs, make smaller amounts instead.

(6) *Reconsider the human-computer standpoint*. Interaction between humans and computers will reshape their relationship. While designing an interaction, designers should carefully examine stated and unstated assumptions and/or biases (including their social and emotional interaction) embedded in the interface, interactive factors, and operation.

(7) *Reconsider motivation*. Affordances in a design privilege its ideal user over others by allowing or forbidding specific actions and behaviors from the user. In HCI design, designers should consider the motivation and rationale behind the product and formulate the affordances accordingly.

(8) *Foster collaboration*. A successful and meaningful relationship is engaging and collaborative. Designers should make their best effort to design HCI in an engaging style. In practice, participatory design with small communities will improve the processes of user research, design development, testing and evaluation, and design delivery.

4.3. Posthuman HCI

After two other perspectives, posthuman thinking helps to add the last two heuristics:

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(9) *Balance workload*. Designers should pay attention to the equality in HCI in ways that not letting computers do all the work while human users only casually give verbal commands. That said, designers need to reconsider the necessity of each step in the interaction and make efforts to promote a balanced, collaborative relationship between humans and computers.

(10) *Share responsibility*. Mutual coexistence requires shared commitment in the interaction. Through effective communication, decisions and changes should be made after they have known all the related information they need for the deciding issue. In practice, designers should make the instructions clear and readable. In addition, pay attention to the computer's safety in terms of technical durability and reliability.

Given the broad topic of posthuman, I would like to cite Aspling (2015) as a final remark on posthuman HCI:

> The increased involvement of nonhuman species in interactive contexts supported by digital technology, which could be framed as multispecies-computer interaction, leads to new possibilities and forms of interactions, and consequently, a need to reconsider what this is and can be in terms of interaction. There is a need to think beyond the human and confront the challenges associated with the inclusion of other species with dissimilar cognitions, experiences, senses, abilities, time-scales, wants and needs. (p. 1)

Although some of the items in this quote, such as experiences, senses, and wants and needs, are out of reach of the current HCI discourse, I believe they are worth looking into for future research.

5. Reflection and Suggestions

In retrospect, this essay is more like an exploratory work than a knowledge-based analysis. The essay triangulates the discussion into three intersections (i.e., philosophies and art-of-living, arts-of-living and HCI, and philosophies and HCI) to develop a more comprehensive view of the philosophies-arts-of-living-HCI assemblage. As Bardzell (2010) reminds us, "As we aspire to develop more pervasive, ubiquitous, and universal technologies, we inevitably also must engage in the increasing moral and intellectual complexity of our professional activities" (p. 1301). In order to articulate the connections among them, the essay draws on much more references beyond HCI literature.

However, as the reviews and analyses have shown, little HCI research was conducted from/for non-anthropocentric views, let alone to pay attention to the computer side in the interaction (aside from their material value). For future HCI research, I would like to look into people's relationships and interactions with the same technology regarding their philosophical stands. People with different ideologies and views toward nonhumans might act differently on objects. In addition, I would like to know whether there are any interacting differences between objects, technological objects, and advanced technology objects. With more non-anthropocentric research, humans will have a more harmonious coexistence with all the otherness.

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