Crafting Bodies and Auras: Speculative Designs for Transhuman Communication

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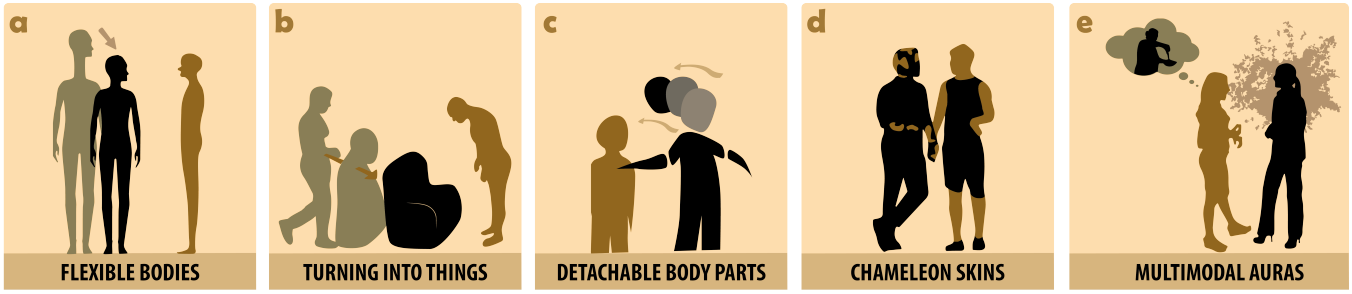

Figure 1: Design speculations about crafting bodies and auras for transhuman communication

ABSTRACT

Bodies exhibit communicative qualities, including gestures, facial expressions, body odors, and changes in proximity, like tattoos, clothing, and accessories. However, a transformative shift in human bodies looms ahead, propelled by transhumanism's proposition of integrating machines with humans to enhance physical, sensorial, cognitive, and emotional capacities. This poster explores communication opportunities and potential consequences around transhuman technologies for the temporal alterations on the body through speculative designs. These speculations are formed based on four co-speculation workshops with the attendance of participants (N=35) with varying experiences in fiction creation and technology development. By envisioning flexible bodies, transforming into objects, detachable body parts, chameleon skin, and multimodal auras, our work contributes design speculations to spark discussions on the transformative impact of transhuman technologies on communication, prompting innovative investigations into this uncharted territory.

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CCS CONCEPTS

• **General and reference** → **Design**; • **Human-centered computing** → **Human computer interaction (HCI)**; **Collaborative and social computing devices**.

KEYWORDS

Transhumanism, human augmentation, human-technology integration, wearables, speculative design, communication

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1 INTRODUCTION

Communication stands as a vital component of human existence, facilitating cooperation and coordination among both humans and non-human animals. This progression has spurred the evolution of intricate modes of communication, encompassing natural languages, artistic expressions, and written systems. Bodies have always been important in communication, providing modes of expression through gestures, facial expressions, clothes, accessories, perfumes, and body paintings such as tattoos. Within this landscape, new media offered to provide diverse and distinctive communication opportunities by modifying the body in virtual reality [4] and/

or through social wearables [14], on-skin interfaces [30] and olfactory devices [2]. Nevertheless, the advent of transhumanism introduces a new perspective on communication by offering integration between technologies and bodies. It suggests new abilities for altering individuals physically, sensorily, cognitively, and emotionally [5, 37].

The prevalent perspective in transhumanism highlights the potential of human augmentation, aiming to enhance unity, immediacy, and efficiency. However, this approach risks sacrificing diversity and individuality in favor of homogenized "perfected" transhumans [25, 35]. In contrast, akin to how people express themselves through clothing and perfumes, imperfection and diversity provide opportunities to contribute to cultures through varied viewpoints and semiotic elements [21, 32]. Therefore, an expansion of mainstream transhuman ideologies is needed to explore how transhumanism might be redefined to serve the communication landscape. For this, we embrace Haraway's concept of "cyborgs," [22] which challenges conventional notions of identity and embodiment. From this standpoint, we posit that Human Augmentation Technologies (HATs) possess the remarkable potential to not only reshape but also diversify future communication. The notion of human-computer integration [45] has instigated explorations into diverse communicative encounters through physical and sensory augmentations. These include implantable and prosthetic technologies for social engagement [38], expressive use of artificial limbs [10, 53, 54]. While these works provide inspirational individual instances of how the future of communication might be through body modifications, to fully understand communication within transhuman societies and harness the possibilities arising from merging technology with bodies, a wide and critical exploration becomes imperative.

To move in that direction, this poster presents speculative designs [16], exploring the possibilities of modifying bodies and the auras, the space around the body. In the realm of Human-Computer Interaction (HCI), design speculations [16] serve as a means to disrupt conventions, giving rise to artifacts or prototypes that encapsulate divergent societal contexts and ideologies. We utilized this approach by conducting four co-speculation workshops [12] in the scope of a broader project on investigating transhuman communication technologies through speculative design. In total 35 people with varying experiences in fiction creation and technology development attended four thematic workshops that focused on different augmentations: cognitive, physical, emotional, and sensorial [5]. In the scope of this paper, we report five design speculations that are formed through Reflexive Thematic Analysis (RTA) [6] of workshop data and describe opportunities around utilizing temporal modifications of bodies and the auras for communicative purposes. Our work contributes a set of design speculations to foster discussions about the probable pitfalls and benefits of transhuman technologies in the future of communication.

2 BACKGROUND

2.1 Transhumanism

Transhumanism, a philosophical and technological movement, advocates integrating technology into the human body to enhance physical, cognitive, emotional, and sensory aspects [5, 37]. Modern technology's rapid evolution has expanded these practical possibilities, from prosthetic limbs boosting physical speed [46] to brain implants enabling cognitive enhancements [51] and gene therapy redefining human capabilities, such as enhancing sports performance [35] and altering bodily appearance [49]. However, the normative tendencies and potential oppression intrinsic to transhumanist thought can be criticized, [31, 40]. The supposed legacy of transhumanist ideology as a product of linear progress has been already in question due to potential misinterpretations for legitimacy [31, 40]. Transhumanism faces an ethical "values dilemma," where the pursuit of "improvement," "health," or "happiness" necessitates defining these relative to existing norms [40]. Embracing transhumanist futures demands awareness of HATs' potential eugenic implications, considering historical harm [28, 41, 43, 44].

Amid the critique of transhumanism, an exclusive focus on normative progress risks undermining future communication practices, potentially reducing human interaction to mechanistic information exchange. However, an alternative perspective, as proposed by Haraway [22], challenges traditional notions of identity and embodiment by advocating a pluralistic approach, blurring the boundary between humans and machines. Embracing this diverse outlook, we aim to investigate how HATs can reshape communication practices by creatively exploring body and aura modifications.

2.2 (Trans)human Communication Technologies

Human and digital communication, though increasingly intertwined, exhibit fundamental disparities. Human communication is intricate and characterized by diverse interpretations, exemplified by Jakobson's functions of language [26], which recognize its complexity through various components such as message, sender, receiver, channel, code, and context. Interpretative semiotics, influenced by C. S. Pierce [39], emphasize the recipient's role in shaping textual meaning, while Eco's concept of texts as "lazy machines" [19] underscores collaborative meaning-making. The human body and associated modifications also contribute to this intricate communication, encompassing postures, gestures [9], facial expressions [8], clothing [42], perfumes [15], and body art like tattoos [52]. Given these complexities and the interpretive essence of communication, addressing the potential of body augmentations for communication in a transhuman future necessitates broadening our perception beyond mere mechanics.

Indeed, augmenting the body with technology to complement the complexity of communication has been a topic of investigation in HCI through wearables and VR applications. For instance, [4] developed VR environment that lets humans express themselves through 3D visualizations of biometric data, exceeding the limitations of physical worlds. Social wearables [14], on the other hand, enable communication through newly situated modes of communication such as changing the colors of the garments [29]. On-skin interfaces, i.e., [30], promise interactive cosmetic changes on the skin. Olfactory wearables [2] are also developed for memory activation which might enable communicative uses.

Apart from wearable and VR approaches, researchers, and developers actively explore the potential of technology integration with our bodies. For instance, Yamamura et al. created "JIZAI ARMS,"

allowing limb sharing as a step toward "social digital cyborgs" [54]. Mueller et al. design interactive games using implantables and artificial limbs for social play [38]. Xie et al.'s "augmented tail" device introduces new gestures [53]. Buruk et al.'s interview study with artificial limb developers [10] highlights light, movement, and sound to intensify emotional expression. Furthermore, integrating technology into their bodies, Harbisson is a cyborg activist who perceives non-visible colors [23], and Ribas is an artist who senses distant earthquakes [1].

The mentioned works exemplify how HATs can forge new communication experiences. Yet, while they offer prototypes for such scenarios, these are specific applications reflecting current technological limits. To fully understand communication within transhuman societies and harness the possibilities arising from merging technology with bodies, a thorough and critical exploration becomes imperative.

3 METHOD

Co-speculation, a participatory approach to speculative design, involves engaging diverse stakeholders in envisioning future concepts [12]. Several HCI studies have already utilized speculative design to investigate transhumanism, exploring concepts such as trans-urbanism[48], children's technologies [11], and inclusive futures [7, 24], shifting the focus from technological development to shaping diverse and everyday experiences in transhuman contexts. Our study employed co-speculation through four thematic workshops centered around distinct facets of HATs, encompassing physical, sensorial, cognitive, and emotional dimensions [5, 37]. These workshops were integrated into a special topic course, "Speculative Design for Transhuman Communication Technologies," at Tampere University, attracting participants through a selective application process. The chosen 35 participants (11 women, 23 men, and 1 undisclosed gender) included participants with experiences in fiction creation (N=13) – such as writing amateur short stories and scripts for movies-, technology design and development (N=14) – i.e., robotics, software design, embedded systems -.

The workshops followed a similar structure with minor variations. The process involved: (1) an introduction, (2) warm-up activities fostering creativity, i.e. [3] and mindful body awareness [27], preceding lunch. Afterward, (3) a brainstorming technique named "3-12-3" [20] was employed for rapid ideation: Participants had 3 minutes to generate keywords and 12 minutes to synthesize and present ideas. (4) Affinity diagramming [33] with participants was then used to further develop concepts and group them while also encouraging speculations about communication scenarios. (5) Ideas were elaborated through paper prototyping [47] and body-storming [34], enabling exploration and scenario creation. (6) Refined concepts were presented through enactments, followed by discussions.

The workshop data underwent RTA, an iterative method for identifying key concepts and overarching themes through active engagement and data reflection [6, 13]. The data was coded twice in iterations by the primary author, and themes were collaboratively developed by the authors. In the scope of this paper, we considered a portion of the analysis results and formulated HATs focusing on themes about body alterations for communication. While presenting them, we designate WS-Phys, WS-Sens, WS-Cog, and WS-Emo to represent workshops centered on physical, sensorial, cognitive, and emotional augmentation. Additionally, we employ AffDiag, FinEnact, RefReport, and RefQues to signify affinity diagramming discussions, final enactments, reflection reports, and reflection questionnaires correspondingly.

4 SPECULATIVE HUMAN AUGMENTATION TECHNOLOGIES (HATS)

4.1 Flexible Bodies

This HAT (Fig.1a) focuses on the idea of temporarily changing the body scheme during communication experiences. To exemplify communicative uses of this HAT, participant discussions illustrated an instance wherein transhumans modify their bodies to align with their conversational companion, indicating: *"'Oh, let me come to your level!' [transhuman shrinking down to adjust] ... I could imagine it might be rude if I don't adjust to the level [of the conversation partner]"* (WS-Sens, AffDiag). As suggested in this scenario, transhuman communication technologies might extend communication by adding new postures and gestures as new vocabularies for non-verbal communication. While the exemplar of flexible bodies highlights height adjustments, different opportunities can be speculated. For example, extending fingers might constitute a new gesture, and squeezing the body into a flat form during communication might be a new posture.

4.2 Turning into Things

Pushing body scheme modifications to their limits, participants delved into the potential of metamorphosing into objects (Fig.1b). These transformations empower transhumans to transform in the form of non-human objects and leverage their physical and symbolic capacities as new channels for communication. As examples of these transformations for communication from the AffDiag session of WS-Sens, one idea involved becoming a plush couch to offer a comforting and snug encounter to others. Another one suggested turning into a house to provide refuge and security to people. In this regard, transforming into things opens a space for design explorations about identifying and utilizing communicative attributes of things for transhuman communication.

4.3 Detachable Body Parts

This HAT (Fig.1c) envisions transhuman bodies consisting of flying body parts (i.e., arms, heads or individual sensory organs) that can be attached or detached for communicative purposes. These body parts are connected to each other wirelessly. For instance, an arm detached from the body still can transmit haptic feelings or an eye flying can still contribute to seeing the sensation of the body. One example utilization was suggested as a head detaching from the body and raising up when the transhuman is excited while in conversation (WS-Phys, AffDiag). While this scenario illustrates a relatively less radical utilization with the detached body part situated near the rest of the body, body parts can detach from each other radically deconstructing the body in the physical space. In this regard, the body can be distributed in a physical space allowing simultaneous interactions with different individuals: For instance, in a party scenario, the host with this HAT might communicate

with multiple guests through individual body parts situated in different places in the room. Actually, a similar case was illustrated in FinEnact of WS-Phys, a transhuman executing a task with their arm on the other side of the room, while communicating to another individual, raising discussions around whether this would be distracting for the conversation partner.

4.4 Chameleon Skin

Chameleon Skin augmentations (Fig.1d) suggest that partial or all skin of an individual can be replaced with a synthetic one, enabling dynamic changes in color, texture, and transparency. While participants foresaw such skin transformations can reflect the emotional state of the transhuman during communication (WS-Phys, AffDiag), they also speculated changing skins to express individual styles: *"My happiness can be pink and yours could be textured"* (WS-Emo, AffDiag). Furthermore, envisioning utilization of this HAT in contexts such as funerals or work, the ability to craft skin might lead to social pressure for an appropriation of one's skin contextually. For instance, for funerals, it might be considered rude to have colorful skin or, on a busy work day, people might be expected to be monochrome for not distracting others (WS-Phys, AffDiag). Finally, the discussions around this speculation also highlighted the possibility of norm-confirming trends emerging, such as changing skin to look young forever (WS-Phys, AffDiag).

4.5 Multimodal Auras

The idea of multimodal aura (Fig.1e) suggests that the space around the body can enable expressive opportunities through body-embedded technologies. Transhumans can create multimodal expressions in close proximity to their body, i.e., through smell, vibrations or visual spaces, for non-verbal communication and personal expressions. Exploring olfactory signals, a participant highlighted the potential of diffusing a smell from their body as reminiscent of *"mother's cooking"* (WS-Sens, AffDiag) to influence a conversation partner by utilizing the symbolic associations of smell in communication. Another participant extended this notion by suggesting, *"You can sprinkle some pheromones to be flirty"* (WS-Sens, AffDiag). On the other hand, an instance from WS-Emo involved an emotional screen, a field enveloping the body that intensifies or dampens emotional expressions, i.e., crying (AffDiag).

5 DISCUSSION

The concepts presented in this poster propose novel transhuman modes of generating signs [17], empowering bodies with enhanced abilities. In this regard, *adaptable bodies* and *camouflaging skins* amplify existing communication techniques such as body language and clothing, in alignment with prior work on prosthetic limbs [53], social wearables [14], and on-skin interfaces [30],

On the other hand, the notions of *morphing into objects- removable body parts*, and *multi-modal auras* introduce relatively radical modalities for communication where the bodies are not bounded by conventional norms. *Transforming into things* taps into the attributes of objects for communicative intents, ushering in a novel design domain that explores how transhumans could interact while embodying the form factors of various objects. For instance, researchers can investigate opportunities involving how a transhuman might communicate through interactive features of everyday items like lamps and coffee machines. Additionally, transhumans possessing *detachable body parts* can be situated in diverse locations, enabling simultaneous interactions, yet, our work highlights the (distracting) impact of this multitasking while in communication should be examined. Finally, the concept of *multi-sensory auras* envisions transhumans using all senses to evoke emotions in others, even potentially employing scents (akin to [2]), manipulation, or chemical communication like certain plants and non-human animals. This might lead to explorations on HATs to examine non-human ways of communication for transhumans.

These enhanced capacities to generate signs have the potential to foster greater *variability in meaning-making*. Here, we emphasize the intricate process of meaning creation, entailing the communicative intent of the author, the interpretive decisions of the reader, and the inherent structure of the communication medium (as elucidated by Eco [18]). In this light, the emerging transhuman communication modes introduce novel structural attributes that could be arguably more ambiguous compared to traditional forms of verbal or gestural communication. Yet, on the other hand, the potential capacity of transhumans to reshape their physical existence through these novel means might also reinforce existing norms; for instance, transhumans altering their skin to maintain eternal youth, as noted in *chameleon skin*. Indeed, our HATs could potentially exacerbate systemic issues related to appearance-based bias [50], extending it to different dimensions (e.g., the non-human forms, chemicals and smell). Similar patterns can be observed in individuals' avatar choices in virtual social realms like Second Life, where female representations often mirror gatekeepers' avatars reflecting Western beauty ideals, thereby marginalizing others [36]. Therefore, while HATs offer an array of avenues for transhumans to physically express themselves, they could also inadvertently reinforce existing notions of appearance.

6 CONCLUSION

Our co-speculative exploration of transhuman communication unveils a realm of transformative possibilities through HATs. By envisioning flexible bodies, transforming into objects, detachable body parts, chameleon skin, and multimodal auras, we challenge conventional communication norms and ignite discussions about the complex interplay between technology, identity, and expression. While HATs offer promising avenues for enriching communication, they also carry the potential to reinforce existing norms and biases. Our speculative designs invite reflection on the ethical, social, and cultural dimensions of transhumanism, prompting a collective commitment to shaping a future that balances innovation with inclusivity in the evolving landscape of human interaction.

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