Confero | Vol. 4 | no. 2 | 2016 | pp. 77-96 | doi: 10.3384/confero.2001-4562.161218

What the surrogate touches: The haptic threshold of transhuman embodiment

David P. Parisi

The promise—and threat—of transhumanism arises from its proponents' enthusiastic advocacy for using technology as a means of augmenting the natural powers of the human body, with transhumanism permeated by what Max More describes as "an optimistic flavor"[1]. Many of the ethical concerns mobilized both by proponents of transhumanism and by its critics revolve around the difficulties inherent in attempting the evolve humans through technology that is frequently shot through with explicitly or implicitly political agendas, and moreover, often seems to be steered by corporate interests[2]. Media, what Marshall McLuhan famously referred to as "extensions of man," are essential participants in the transhumanist aim of bodily enhancement, providing a variety of ways to project the biological body's sensory organs and motor functions across space and time. In this article, I want to push specifically on touch's role in realizing the rationalist and functionalist aims of transhumanism, taking seriously its proponents' claims that transhumanism celebrates, rather than denies, the biological body. I am concerned with what we may think of as the use-values imagined for touch, as it increasingly comes to be treated as both an object and enabler of technological advancement. Understanding touch as a

[1] More, 2013, p. 13.
[2] For example, see Stock, 2013.

category that is always contested, always capable of being reformatted [3] and rearticulated in response to shifting socioeconomic stresses, I am less interested in identifying absolutes around touch's capacity for or hostility to technological extension than I am in getting at the process by which touch's parameters are negotiated and reimagined.

To get at this relationship, I examine the depiction of cyborgian humans in Jonathan Mostow's 2009 film *Surrogates*[4]. In the film, human social interaction occurs almost exclusively through the hypermediation of highly advanced humanoid robot avatars dubbed surrogates (or 'surries' in the slang used throughout the film). Mostow explicitly positions this vision of a society wholly transformed by the adoption of a mediation technology as the expression of a transhumanist worldview. The short documentary *A More Perfect You: The Science of Surrogates*[5] that accompanied the film's 2010 Blu-ray release featured interviews with experts and industry leaders in fields ranging robotics to prosthetics to telepresence, with each testifying to the plausibility and inevitability of the technosocial world depicted in *Surrogates*. I will therefore understand the surrogate technology Mostow posits as a type of imaginary media—"impossible machines mediating impossible desires," as Eric Kluitenberg[6] puts it—grounded in an aesthetics of the plausible. The tactile link between robot surrogate and human operator is a defining feature of new medium, crucial to bringing about the radical transformations in social and political life portrayed throughout the film. The ability to *feel* fully present in the remotely-manipulated robot body facilitates the utopian ascendency of surrogate technology, while the increasingly unbridgeable gaps between the sensory system of master and slave stage its inevitable collapse.

[3] Elo, 2012.
[4] Mostow, 2009.
[5] Wheeler, 2009.
[6] Kluitenberg, 2011, p. 67.

A Humanist Touch

Shifting notions of the human are always accompanied by redefinitions, reprioritizations, and reconstructions of the body and its senses. The senses, either individually or in fragments, have the potential to facilitate or inhibit access to a 'human' that is itself continually adapting to new circumstances. But where transhumanism embraces this ongoing technogenesis of the senses, others push back on a perceived colonization of human communication by technology (see for example, Sherry Turkle's embrace of technophobic anxiety in *Alone Together*), positioning human and technology as antagonistic formations, where a gain by one entails a loss by the other. The vulnerability of a sense modality to technological permeation, then, jeopardizes its standing as a human sense.

In a mediatic ordering of the senses that takes for granted the extension, abstraction, and computerization of vision and hearing, touch has often been framed as having naturally inbuilt bulwarks against such takeovers—what Jacques Derrida termed a "haptocentric intuitionism" that holds touch out as the ultimate and undeceivable guarantor of authenticity[7]. In its apparent capacity to evade the logic of medialization, motivated by the belief "that touching resists virtualization"[8], touch often marks the final, irreducible refuge of the human. "Stubbornly wed to the proximate," as communication theorist John Durham Peters contends, touch is the sense "most resistant to being made into a medium of recording and transmission," defying inscription and lacking remote capacity[9]. Touch thus remains grounded in a "nonreproducible" biological body that cannot be collapsed onto its signifying functions. In this positioning, Peters echoes the twentieth century humanist rehabilitation of touch, which located the re-embrace of touch as the key to restoring a dimension of human experience lost due to a range of de-humanizing social, cultural, and technological developments. The humanist

[7] Derrida, 2005, p. 300.
[8] Derrida, 2005, p. 300.
[9] Peters, 1999, p. 269.

anthropologist Ashley Montagu, for example, lamented the general lack of tactual contact among those in British, German and American cultures, offering his landmark study *Touching: The Human Significance of the Skin* as an empirically-informed call to restore this neglected dimension of human experience[10]. Media theorist Marshall McLuhan, whom Montagu corresponded frequently with, criticized Gutenberg technology for intensifying the fragmentation of the human sensorium. Seated at the heart of a unified human, touch, for McLuhan, was not a specialized mode of perception, but rather "total, synaesthetic, involving all the senses."[11] As a "technological humanist,"[12] McLuhan celebrated electronic media not for their capacity to extend and amplify the sense of touch, but rather for the capacity of these media to become like touch. In the electric age, McLuhan predicted, humans would take up residence in a technological environment that mirrored the fundamental unity of human sense experience, a unity denied by media that extended the specialized senses of seeing and hearing.

Following in this tradition, contemporary haptic interface designers, who use technology to embed touch in computer interface systems, valorize their creations as the means to make whole a fragmented sensory experience of interacting both with computers and with the other subjects who operate them. The technoscientific synthesis of tactility, then, is unproblematically framed as a technique capable of reversing the gradual loss of the human—haptic interface technology allows us to "de-evolve," as one interface designer puts it, into a more basic mode of interacting with virtual objects.[13] Responding to a visualist paradigm in the design of virtual environments, these engineers write touch into a space that had previously excluded it[14], and in doing so, purportedly humanize the experience of visual-virtual

[10] Montagu, 1971, pp. 283-286.
[11] McLuhan, 1994, p. 334.
[12] See Kroker, 1995.
[13] Gruber,1998.
[14] For a critique of VR's visualism, see Ken Hillis's *Digital Sensations* (Minneapolis: University of Minnesota Press, 1999), xx-xxiii.

worlds, opposing the technologized senses of seeing and hearing with a touch that is inherently countermediatic.

Surrogates as (Imaginary) Haptic Media

Given the increased significance touch has come to occupy in our interactions with media, this notion that touch cannot be captured, stored, and transmitted seems to be outmoded, with the deployment of virtual touch technologies in a range of sites, including mobile communication, surgical applications, the new generation of virtual reality interfaces, networked cybersex devices, videogaming, automobiles, and prosthetics. Projections of significant growth in the market for the various technical components that provide touch feedback—an admittedly crude indicator—portray a future where haptics applications are both ubiquitous and robust [15]. Accordingly, I have suggested elsewhere[16] that we should operationalize a specific category of haptic media that approaches touch's mediatization from an empirical and genealogical perspective, pushing toward an understanding of haptic media as historically contingent objects. The designation 'haptic media,' then, offers a strategy for confronting the myriad attempts at writing touch into media technologies, showing how such efforts involve both the renegotiation of touch's cultural status, driven in part by the advertisements that attempt to create demand for these new machines, and an ongoing reformatting of touch's constitutive technical features, executed in the research labs of engineers, psychologists, and neuroscientists. Haptic media should not be seen as an ontologizing categorization, but instead as a way of orienting attention to what has frequently been a neglected aspect of media histories.

The machines used for bodily extension and amplification in *Surrogates* are certainly, from the standpoint of the senses, mixed media—that is, they extended multiple sense modalities across

[15] see for example Vicari, Melnick, and Holman, 2013.
[16] Parisi and Archer, forthcoming.

space, allowing their users to feel fully present in remote environments by seamlessly braiding together data from the range of bodily senses. But understanding surrogate technology as a type of haptic media allows us to hone in on the specific role that touch's technologization plays in bringing about the utopia depicted at the start of the film. This haptocentric reading is further justified by the genealogy of surrogates provided both in the film's opening credit montage and in *A More Perfect You*.[17] Although *Surrogates* is set in an unspecified year not too far in the future, the credit montage begins with news stories and documentary footage taken from 14 years before the film's present, as newscasters voice over clips drawn from the headlines of real robotics research[18]. By splicing together fictional and real news footage, the film shows surrogate technology as an imminent outcome of contemporary developments in cybernetics, making the seamless interface between the operator's neural apparatus and the robot's sensory system appear credulous and inevitable.

Having established the viability of the film's central (impossible) technological premise, the news footage proceeds to describe the rapid adoption of surrogates and the resulting social

[17] For purposes of this essay, I will collapse the positioning of the surrogate technology offered by *A More Perfect You* onto the diegesis of *Surrogates*' fictional world.

[18] For example, the 2008 research by a team of University of Pittsburgh researchers which allowed a monkey to successfully control robotic arms via implants in its brain. These findings, originally published in *Nature*, were widely reported in popular scientific press outlets. See Meel Velliste, *et al*., "Cortical Control of a Prosthetic Arm for Self-feeding," *Nature* 453, no. 7198 (June 19, 2008): 1098–1101. doi:10.1038/nature06996. It could be argued that, by drawing on published and dated research, *Surrogates* actually does provide fixed temporal frame for the events that unfold throughout the film—if the trials with the cyborg monkeys were 14 years before the film takes place, the film would be set in 2022. The actual year is, however, never identified in the film. By contrast, in the graphic novel that the film is based on, the writer clearly and directly establishes the year 2054 as the setting for the story.

consequences that accompanied their widespread use. This chronology takes a decidedly technophilic and deterministic tone, parroting the expert testimony offered in *A More Perfect You*, with proponents touting the "evolutionary significance" and positive effects of surrogate technology. Echoing advocates of present-day brain-controlled prosthetics, fictional surrogate technology inventor Lionel Canter (James Cromwell) celebrated their potential to allow "physically disabled people...to operate fully synthetic bodies." Surrogates, then, began as attempts at a sort of restorative justice for damaged human bodies, offering to replace damaged or lost human limbs with fully-functional clones. Again, this is a wish repeatedly expressed around contemporary prosthetics research, where the machinic replication of touch is framed as an essential challenge to be overcome by engineering know-how. In his 2015 State of the Union Address, US president Barack Obama touted efforts by American scientists at "creating revolutionary prosthetics so that a veteran who gave his arms for his country can play catch with his kids again." A slide featured in the televised version of Obama's address depicted a robot hand akin to those shown throughout the *Surrogates* montage, with the accompanying text noting that "the Defense Advanced Research Projects Agency (DARPA) is building a new generation of prosthetics that can be moved with thoughts alone, and can feel the warmth of touch." The addition of complex computerized touch feedback, what Marvin Minsky once described in his hallmark essay "Telepresence" as the capacity to "translate *feel* into feel"[19], marks the passage of prosthetics research into a new era, tacitly declaring that touch is no longer a sense resistant to mediation.

The narrative positioning of technology as a humanistic agent whose advancement is driven forward by a desire to relieve suffering is a familiar one in transhumanist discourse, with the innocent and well-intentioned desire to humbly use technology as a way of merely giving back that which has been stolen situated in opposition to a more pernicious desire to use technology to augment the body's natural capacities. The movement's

[19] Minsky, 1980, p. 52.

staunchest proponents proudly embrace augmentation along with restoration, advocating for minimal constraints on the use of new technologies (see for example Stock's position on Germinal Choice Technology). *Surrogates*, however, indulges in a simple morality play, with the opening montage describing a quick weaponization of surrogates tech. The transformation from assistive to military technology drove manufacturing costs down, and surrogates soon became mass-marketed commodities, with their appeal driven by consumer desire to inhabit a body that would allow them to feel "total sensory immersion" in a remote environment. However, as Andy Clark explains, the border between restoration and augmentation is often difficult to pinpoint: "the line between these kinds of rehabilitative strategy and wholly new forms of bodily and sensory enhancement is already thin to the point of non-existence"[20]. *Surrogates*, in clearly delineating the shift from therapeutic to augmentic use, moralizes the latter, while valorizing the former.

Absent the impending threat of bodily injury, and able to inhabit a body that would perpetually conform to a normative visual standard of healthfulness and beauty, surrogates enabled a whole host of new experiences. The widespread adoption of surrogates seemed to provide a pathway to utopia, bringing about transformations in the lives of individuals, along with corresponding sociological shifts—in the film's present-day, 98% of the world's population "uses surrogates in their daily lives," with "crime, communicable disease, and discrimination" have been all but eliminated. As one newscaster explains, "problems that have plagued societies for centuries[…]solved almost overnight." This new utopia is, of course, not with its malcontents: continuing to comingle reality and fiction, the film shows Gregory Stock, CEO of the Signum Biosciences whose writing is also featured in *The Transhumanist Reader*, predicting that "many people will see this as the invasion of the inhuman." Those who refuse the technology ("meatbags") live walled-off from the rest of the populace in legally-designated, surrogate-free "reservations;" in these ghettos, residents "sacrifice many modern pleasures and

[20] Clark, 2013, p. 118.

conveniences to feel truly connected" with each other, rejecting all machines in favor of a "human" existence.[21]

A strategically-reconstructed touch, then, enables the genesis of the utopia depicted in *Surrogates*, while also feeding the sense of bodily alienation that causes its eventual downfall. Surrogate technology succeeds because it effectively engages in an impossible coupling between the robot's artificial sensory system and the operator's brain. But the pairing is instrumental and temporary, rather than absolute; the tactile data gathered by surrogate is not relayed with perfect fidelity to its operator. The interface provides the illusion of transparency, but it is a distorted haptic mirror, selectively shielding the operator from what would otherwise be painful and damaging contacts experienced by the surrogate body. The interface modulates the transmission of pain and pleasure; it encodes and enacts ideologies of sensation, permitting the desirable to pass through its filter, while banning and restricting the undesirable from coming into contact with the operator's sensorium. The surrogate touches, and the operator feels—but only after those feelings have been made to pass through an instrumentalized and ideologically-loaded filter. It cleaves tactile sensations into categories of 'good' and 'bad'—or transmissible and non-transmissible—and then refuses to relay those placed in the latter category. During a particularly violent chase scene, the surrogate body operated by the protagonist Detective Tom Greer (Bruce Willis) loses its arm. Both Greer and his surrogate are unshaken by the trauma; through the robot's eyes, he looks with disinterest at the electromechanical stump left behind by the injury before calmly walking over to the severed limb to retrieve the rifle held in its disembodied, lifeless hand. It is not that the robot's body is incapable of tactile sensations, but rather that algorithms beyond the control of the human operator ("failsafes" in the film's language, or what Derrida termed the "algorithms of immediate contact") govern the transmission of sensations from machine to human. The successful closing of the

[21] On the primitive reservations, bicycles are apparently not classed as machines, as their residents (referred to as "dredds") ride them everywhere.

surrogate-operator circuit depends on the robot's capacity to feel—the operator's ability to dexterously control the surrogate depends on the surrogate having a fully-synthesized haptic system, complete with hundreds of thousands receptors in a network distributed throughout the robot's skin, muscles, and joints. It is not the *perfect* extension of haptic system through the surrogate interface, then, that imbues the operator with this transhuman potential, but rather, the selective opacity of the interface—its ability to shield the operator from pain, while allowing pleasurable sensations to pass through the filter unaltered.

Transhuman Tele-existence

In robotics research, the push toward transhuman modes of bodily existence brought about a new appreciation of touch's immense complexity and centrality in the human mode of being. In the tele-existence approach to remote manipulation, furthered over the last three decades by Susumu Tachi, full corporeal re-embodiment hinges on the capacity to technologically synthesize touch. For Tachi, tele-existence "allows humans, who are assumed to be emancipated from the restrictions of time and space, to exist in a 'location' defined by inconsistent time and space, or in a virtual environment"[22]. By combining computer graphics with tactile sensation feedback and force sensation feedback, tele-existence facilitates the feeling not just of being present in a remote or virtual environment, but of acting on and being acted upon by the distant or computer-generated space. Though the theme of presence in virtual environments has been a common both in engineering and science fiction, Tachi's focus on the bodily sensations necessary to *act* in a remote environment has caused him to prioritize the type of research neglected by visualist virtual reality paradigm. His efforts attempting to embody these sensations in a functioning robot, and to effectively transmit those sensations to a human operator, caused him to recognize the immense and often understated complexity of the mechanisms

[22] Tachi, 1992, p. 8.

responsible for producing bodily sensations. Tachi thus gained an appreciation of touch, and its importance in grounding and enabling human existence, through the immense labor he devoted to reconstructing it. Echoing Tachi's perspective, Anybots CEO Trevor Blackwell, interviewed in *A More Perfect You*, explains his discovery of the human facilitated by robotics design: "the human hand, in fact, the human everything, is incredibly sophisticated. And you don't really appreciate it until you try to build something like it just how perfect it is." Osaka University robotics engineer Hirosh Ishiguro, also featured in *A More Perfect You*, frames his work in a similar fashion. Speaking through a humanoid robot designed to be a near-perfect copy of its creator, Ishiguro states bluntly: "what I want to do is understand what is human by building a robot."

Commodifying and Alienating Embodiment

During an early scene in the film, *Surrogates* calls attention to the importance—and financial costs—of reconstructing touch in a remote sensing robot. When an operator tries to insert a key into a keyhole using a base-model surrogate that lacks a developed set of tactile sensors, the remote unit struggles to fit the key into the hole. After a moment of quick frustration on the part of the operator, her surrogate hands the key to a more capable, higher-end unit, whose fingers possess the requisite dexterity to successfully accomplish this taken-for-granted task. The difficulties of making artificial hands and bodies that can function dexterously has long been identified as one of the crucial challenges of robotics; in General Electric Engineer Ralph Mosher's research on Cybernetic Autonomous Mechanisms (CAMs) from the 1950-60s, for example, he depicted robots who were "lacking human sensing" [23] experiencing difficulty performing simple tasks like opening a door, lifting a chair, rotating a hand-crank, and inserting a pipe into its fitting. Mosher's solution—a significant step that served as a crucial forerunner to contemporary haptics—was to equip the robot with

[23] Mosher, 1967, p. 5.

a sensing mechanism that could feed touch data back to a human operator ("force feedback for the sense of touch" as he described it), effectively separating the labor of data processing from the labor of muscular exertion. In *Surrogates*, this problem has been largely overcome through commercial investment and the corresponding technical advancement it brought, but a touch-deficient unit still proved capable of interrupting the cyborgian operator-machine circuit. Robust touch feedback, and the full haptic embodiment it brings, is situated as a commodity that serves to stratify the different social classes; although the vast majority of the world's population in the film uses surrogates, inequality persists, expressed as a differential in remote sensing capabilities. After the destruction of Greer's surrogate, he visits a cheap electronics store in search of a replacement model. Upon connecting to the new unit, he immediately complains that the robot's body "feels numb." The salesman responds: "It's only a base model, it comes with vision and hearing. You want other senses, they're extra." The sensorium, then, is reconstructed in fragments, according to the logic of the surrogate-as-commodity. Greer only fully confronts the artifice of the surrogate's sensorium when he encounters the wholesale absence of what have been understood in the western tradition as the 'lower-order' bodily senses; vision and hearing alone are not enough for Greer to successfully bridge the gap between his own sensorium and that of the robot. The robot's senses evolve in a reverse order from those of the human—where humanist accounts of touch valorize it for being the first sense to develop both in our collective and individual biological histories,[24] the robot gains seeing and hearing first, with the lower-order senses available as expensive upgrades on the "base" model.

The surrogate's capacity to feel, then, defines both its almost-humanity and its commodity status. But its inability to fully embody and replicate the human sensorium constantly haunts the

[24] In describing touch as the most "archaic" of our senses, Peters echoes the claims offered by haptocentric thinkers like Montagu. Similarly, touch is often praised for being the first sense to develop in the womb, grounding the individual's knowledge of the external world in a primary tactile encounter.

film's protagonist, troubling his relationship with his wife Maggie (Rosamund Pike), who continually insists that they interact only with their surrogates as mediating agents. The film juxtaposes images of their real bodies, isolated in separate dimly-lit bedrooms where the main piece of furniture is the crude, dental chair-like apparatus that facilitates connection to the remotely-manipulated body. Maggie continually insists that surrogacy provides a superior mode of interaction, as it allows Tom to see her as she wants to be seen, shielding her aging body from his. Surrogate Maggie frequently looks on non-surrogate Tom's body with a disdainful pity, as the physical markers of his age (wrinkled skin, grey beard, bald head) and vulnerability (Greer, after casting aside his surrogate, takes a predictably high share of beatings throughout the film, with his face gradually accumulating a collection of bloody scrapes) interrupt the illusion of timelessness Maggie creates for herself by inhabiting a perpetually-young artificial body. Tom, by contrast, increasingly finds surrogacy alienating and inadequate, marked by a feeling of absence rather than presence. Surrogate Maggie chides him for expressing an outmoded desire to interact without being mediated by the robots. Living only through the surrogates, Tom laments, is "not the same," portraying the human once again as something that exceeds and evades technological capture. Throughout the film, we only see Maggie's real body within the private space of her bedroom, where it is presented as an alien object she shamefully hides from both Tom and the rest of the world. Upon disconnecting from her surrogate, she is immediately beset by an anguish she manages by frantically consuming a cocktail of psychotropic drugs, which only serves to enhance the perceptual disjuncture between the surrogate body and her own. Beneath the polite veneer of civilized interaction, the relationship between the body and its perfected prosthetic provides a source of constant anxiety and struggle.

Surrogates presents a theory of the human grounded in a newly-articulated irreducibility of touch. The film does not claim that touch cannot be captured, stored, transmitted, and replayed, but that such a process reaches a limit when the biological body—its haptic system in particular—arrives at a point of incongruence

with its electromechanical double. The senses can be deceived, but only for so long. Unable to age, the surrogate body literally ceases to feel like the real body. As the human body loses its vigor, as perceptual acuity inevitably declines, the incongruence between unit and operator becomes harder to brush aside. The surrogate sensations that once seemed to be an analogue of the human body's own come to index decay and alienation. The threshold at which the human collapses onto the surrogate shifts, and in the process the human re-emerges as a distinct entity. The human irreducible to technology, that threshold between human and machine, gains expression in this technobiological convergence. As a marketed commodity, the surrogate is as much a social product as it is a technical one, a "compromise between engineers and salespeople"[25] whose success depends on the attitude of the operator toward these surrogate sensations. The surrogate becomes a means of accessing the human, of discovering the complexities and wonders of the human body by revealing that evades capture. Throughout the film, surrogate manufacturer Virtual Self Industries continually promotes the technology as a means of feeling totally and fully human; advertisements with slogans like "Plug in and Live" and "Life...Only Better" saturate the visual field of the public spaces the surrogates circulate in. Touch, then, folds within this commodity system: consuming the surrogate signals the tacit acceptance and intensification of the fundamental assumption underlying all media systems. If "media are about the deception of the sense organs"[26], the design of media systems aims at isolating and carefully-specifying the parameters of deception. But the human always refuses to be rendered immutable; it continually reasserts itself in the process evading capture. Rejecting the surrogate signals a failure in the deceptive capacity of the media system, indicating the need to tweak the technical and cultural mechanisms that legitimate the mediatic ordering of the senses. This technological rejection can be understood as part of a cultural feedback loop necessary for the continued suturing of sensory prostheses onto the human body.

[25] Kittler, 1999, p. 2.
[26] Kittler, 2010, p. 38.

A Transhumanist Haptics?

Although *Surrogates* ultimately ends by indulging a clichéd luddite impulse to cast off technology, read in conjunction with the celebratory tone of *A More Perfect You*, it advances a decidedly transhumanist vision. Situating the surrogate interface as the next step in a genealogy of embodied interfaces suggests an inevitability to the technomediatic future it depicts, driven by the seductive promise of human extension through the technologies of remote touching. The strident faith transhumanism places technology's capacity to march forward uninterrupted denies the existence of intractable biological limits, lending credence the film's impossible promise to fuse the haptic system of a human with that of its biological other. However, while the vision of a society upended by the widespread adopt of body-extending and -enhancing surrogate interfaces may seem radical at first glance, when compared to other scenarios imagined by transhumanists, it seems conservative by contrast, as it feeds forward a rather conventional and limiting notion of the body's senses. Hans Moravec, in his essay "The Senses Have no Future", suggested that the human body's biological senses pale in comparison to those modes of sensation that will be demanded by the vast computational environment of cyberspace. So while he predicted, in the short term, the sort of vast improvements in telepresence and tele-existence depicted in *Surrogates*, an advanced "telepresence harness" would be just a stopgap measure in the inevitable need to leave behind the body's conventional senses altogether—even in the Moravec's scenario of the brain-in-a-vat migration of the human into a realm of pure data, the need to process data as images, sounds, tastes, touches, and smells would serve as a hard limit on the bandwidth of human consciousness. In this situation, the senses would have to be transcended and overcome, or else the human species would face an existential crisis: "biological humans," as Moravec explains, "can either adapt to the fabulous mechanisms of robots, thus becoming robots themselves, or they can retire into obscurity"[27]. Even touch, which

[27] Moravec, 1997.

has been said to provide the "reality sense par excellence"[28] would present an obstacle to the continued survival of the human. The long arc of the transhumanist historical narrative, then, promises not to virtualize but to eliminate that sense repeatedly valorized as the most fundamental to our constitution as humans.

Transhumanism, however, frequently pushes a dogmatic and rationalistic determinism beyond the point of absurdity, and we need not accept its fantastical pronouncements as established fact. To close, then, let me return to the more prosaic time horizon of touch depicted in *Surrogates*, as the film's confrontation with the sociocultural consequences of synthetically reconstructing and extending touch raises vital questions about the past, present, and future of haptic media. Reading the surrogate interface as a type of imaginary haptic media refuses the positioning of touch as something possessed and defined by a fundamental irreducibility, depicting it instead as a mode of perception that has already been technoscientifically specified and synthesized, part of a longer history of attempts at coding, transmitting, and replaying haptic sensations. As an imagination of possible media, *Surrogates* expands outward our conception of the possibilities for technologically mediated touch, depicting a seamless and easy merging of human and remote body that tacitly suggests touch is a sense hospitable to mediation. Tactility, in the film, attains a new ontological status as a dehumanized perceptual modality capable of being thoroughly alienated from the body, in contrast to its depiction as a fundamentally and inalienably human mode of perception in media theory.

The present state of haptics technology might provide a window into this disjuncture: to date, the transformational effects of computerized touching have been relatively contained, to the extent that we still do not have a widely-accepted categorization scheme for haptic media. In spite of a technical history that spans more than five decades, today's technologies of computerized touch are not so clean: rather than passing touch data directly into the brain, they depend on a messy and often imperfect set of

[28] Parkhurst, quoted in Herring, 1949, p. 203.

electromechanical mechanisms (vibration-producing motors, force-feedback joysticks, and, in some cases, precisely-controlled bursts of electricity intended to directly activate a nerve) to target individuated sites distributed unevenly across the space of the body. The haptic image they transmit is blurry and filled with gaps. They are frequently cumbersome and expensive, and while they seem to be pushing toward some inevitable final state of improvement, this forcasted future has been forecasted for decades, and still hasn't yet arrived. That crucial threshold past which the self achieves full haptic embodiment in the machine never quite seems to get crossed for too long. The possibility of a high-fidelity, distanced touch exists, in our cultural imaginary, as a perpetually unrealized promise—a concept that has been proven frequently in the design lab, but has not failed to migrate beyond its walls. Andy Clark's 2003 *Natural-Born Cyborgs*, for instance, described a transhumanist body in a state of flux, on the cusp of smashing down and rebuilding the old borders between self and world by the suturing of bleeding-edge telepresence interfaces onto its sensory apparatus. And although none of these technologies—many of which were in the prototype stage at the time of his writing—have achieved a ubiquity that would allow us to register the impact on the everyday, Clark's work itself, moreso than the technologies it confronts, represents an attempt to renegotiate touch's status as a sense inhospitable to mediation technologies.

It is here, in recalling the various imaginaries of technologized touch, that the concept of haptic media achieves its utility: by treating the relationship between touch and mediation as a product of a technoscience that exists embedded within rather than apart from culture, the category of haptic media allows us to push back on the instrumentalization of touch advanced by its technoscientific deployments, recognizing touch's ongoing reformatting as a normative process expressed simultaneously through interfaces, whether real or imagined.

References

Clark, Andy. *Natural-Born Cyborgs: Minds, Technologies, and the Future of Human Intelligence*, Oxford, Oxford University Press, 2003.

Clark, Andy. "Re-Inventing Ourselves: The Plasticity of Embodiment, Sensing, and Min." *The Transhumanist Reader*. Ed. M. More and N. Vita-More. Malden, MA: Wiley-Blackwell, 2013, 114-127.

Elo, Mika. "Formatting the Senses of Touch,"*Transformations* 22, (2012).

Gruber, Jordan. S. "Gropethink: James Kramer wants to get in touch with your feelings" *Wired* 6.10, 1998, http://www.wired.com/wired/archive/6.10/kramer.html. [Retrieved 19 December 2016]

Herring, Francis W. "Touch: The Neglected Sense", *The Journal of Aesthetics and Art Criticism* 7.3 (1949):199-215.

Hillis, Ken. *Digital Sensations*, Minneapolis, University of Minnesota Press, 1999.

Kearny, Richard. 'Losing Our Touch', *New York Times*, August 30, 2014.

Kittler, Friedrich. *Gramophone, Film, Typewriter*, Stanford, Stanford University Press, 1999.

Kittler, Friedrich. *Optical Media*, New York, Polity, 2010.

Kluitenber, Eric. "On the Archaeology of Imaginary Media", in E. Huhtamo and J. Parikka, (ed), *Media Archaeology: Approaches, Applications, and Implications*, Berkeley, University of California Press, 2011. 48-69.

Kroker, Arthur. 'Digital Humanism: The Processed World of Marshall McLuhan', *Ctheory* a028, June, 1995, www.ctheory.net/articles.aspx?id=70. [Retrieved 19 December 2016]

McLuhan, Marshall. *Understanding Media: The Extension of Man*, Cambridge, MIT Press, 1994.

Minsky, Marvin. 'Telepresence', *OMNI Magazine*, June (1980): 44-52.

Montagu, Ashley. *Touching: The Human Significance of the Skin*. New York: Harper, 1971.

Moravec, Hans. "The Senses Have no Future." 1997. http://www.frc.ri.cmu.edu/~hpm/project.archive/general.articles/1997/970128.nosense.html [Retrieved 19 December 2016]

Mosher, Ralph S. "From Handyman to Hardiman", SAE Technical Paper 670088, 1967.

Obama, Barack H. "2015 State of the Union Address : Enhanced Version", White House Office of Digital Strategy. https://www.whitehouse.gov/blog/2015/01/20/watch-president-obamas-2015-state-union. [Retrieved 19 December 2016]

Parisi, David and Jason Archer. "Making Analog: A Manifesto on the Prospects and Perils of a Haptic Media Studies" *New Media & Society*, (forthcoming).

Peters, John Durham. *Speaking Into the Air: A History of the Idea of Communication*. Chicago, IL: University of Chicago Press, 1999.

Stock, Gregory. "The Battle for the Future" *The Transhumanist Reader*. Ed. Max More and Natasha Vita-More. Malden, MA, Wiley-Blackwell, 2013. 302-316.

Mostow, Jonathan. "Surrogates" Buena Vista Home Entertainment, 2010. Movie.

Tachi, Susumu. et al., "Tele-existence in Real World and Virtual World." *Proceedings of the Fifth International Conference on Advanced Robotics*. Pisa: Italy, 1991. 193-198.

Tachi, Susumu. "Artificial Reality and Tele-Existence: Present Status and Future Prospect." *Proceedings of ICAT '92, 2nd International Conference on Artificial Reality and Tele-Existence*. Tokyo, Japan: July 1-3. 1991.

Turkle, Sherry. *Alone Together: Why We Expect More From Technology and Less from Each Other*. New York: Basic Books, 2012.

Velliste, Meel, et al., "Cortical Control of a Prosthetic Arm in Self-feeding." *Nature* 453.7198 (2008): 1098-1101.

Vicari, Anthony, Melnick, J. and Holman, M. "Getting Back in Touch with Electronics: Finding Opportunity in Emerging Haptics." Lux Research: June. 2013.

Wheeler, John. "A More Perfect You" Buena Vista Home Entertainment, 2010.

David Parisi is an Associate Professor of Emerging Media at the College of Charleston. He holds a Ph.D. in Media, Culture, and Communication from New York University. He has published extensively on the relationship between touch and media technology, attempting to give the sense of touch a new centrality in Media Studies. His book *Touch Machines: An Archaeology of Haptic Interfacing* will be published by the University of Minnesota Press in the fall of 2017, and his coediting issue of *New Media & Society* organized around the theme Haptic Media Studies will be released in the spring of 2017