

# **On Becoming A Cyborg: A Reflection On Articulation Work, Embodiment, Agency and Ableism**

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**Abstract:** This article auto-ethnographically explores my experiences over the course of several years as I transitioned from able bodied, to frequent cane user, who used a scooter to attend academic conferences, to a user of robotic telepresence. I discuss the different affordances that those technologies allow, issues of embodiment, articulation work, agency, and ableism. The telepresence robot did not “fix me” as is often implicated with the medical model of disability (Thomson, 1997), or augment my experience to make it more palatable to the able-bodied majority. Instead, it allowed me to make conscious trade-offs between the affordances of my corporeal body and an emergent cyborg-self in the context of a degenerative auto-immune disease. Thus, in writing this article it is my intention to improve the social acceptance of the disabled cyborg-person, and through improved design to I aim to afford disabled persons choices.

## **1 Introduction**

For three beautiful days during UbiComp one fall, I could walk at a brisk pace for six hours at a time. I could nimbly weave through crowds, and I could look people in the eye. I became a cyborg. My flesh body was in Philadelphia, whereas my other body was in Seattle, and my mind was somewhere in between, or neither. Scooters, wheelchairs and canes replaced by this other embodiment, I felt free. This essay auto-ethnographically reflects on my experiences using a telepresence robot. I have used this approach because reflexivity is critical to understanding this experience, and it allows me to address these issues in ways that a positivist approach would not. In doing so I hope to address issues of embodiment, articulation work, agency, and ableism with the intention of improving the social acceptance of the cyborg, and its design to afford disabled persons' choices.

## 2 Method

In this paper, I will auto-ethnographically discuss my experiences since September 2014 with telepresence robots. The way an anthropologist represents oneself is a significant issue in applying anthropologic methods (Geertz, 1988). One needs to simultaneously give oneself authority and credibility by illustrating one was really there, but at the same time accurately representing the culture of the people one is studying. Much debate exists on the benefits of “objective” distant realists accounts as compared to reflexive accounts where the role of the author is discussed (Geertz, 1988). Elsewhere in my work, I have argued for the importance of reflexive practice in ethnography studies of technology use (Rode, 2011). Auto-ethnography is an anthropological method that tries to resolve these tensions; it is a practice which Van Maanen describes as a “wet term signalling the cultural study of one’s own people” (1988, p106). Often this is done to give authentic voice to marginalized groups, whose voices may have previously been tempered through anthropological tales told by academics from dominant groups (Duncan, 2008; Ellis et al, 2010). Here I write about myself as an representative of an emergent group of disabled persons embracing this potentially transformative technology. Disability experience is central to critical disabilities studies and auto-ethnography in particular is a common technique (Smith and Sparkes, 2008; Richards, 2008). In this way, through my own experiences, I aim to study an emergent culture of disabled telepresence users.

My first experience with a telepresence robot was borrowing a Suitable Technologies’ Beam system to attend the Ubicomp Conference in Seattle remotely. Afterwards, I purchased my own telepresence robot which I placed in my lab in the US and later the UK. I will discuss my own usage experiences in the context of my disability, as well as my colleagues using my robot to visit me.

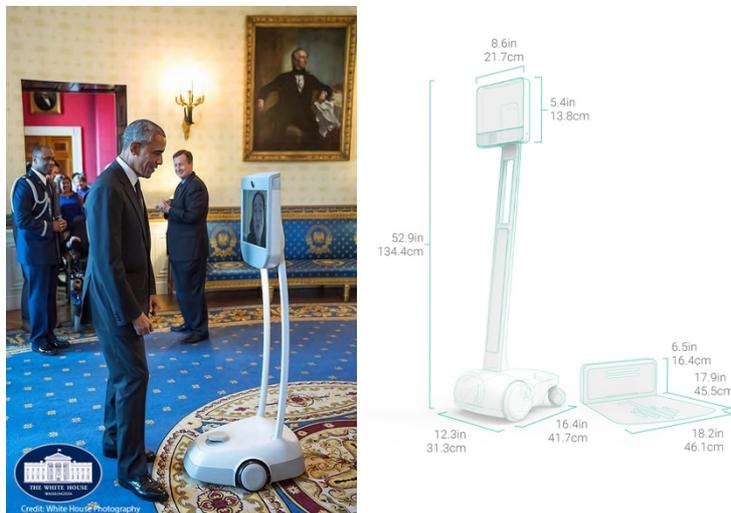
I purchased my own robot using funds generously provided by the American National Science Foundation. I felt it allowed me to socially-construct a different experience of my disability. I have called in to the office using the robot on days I did not feel well enough to leave the sofa; I have also found myself in the office, and yet sending the robot down the hall to talk to a colleague. Yet, I do not condone a medical model of disability. The telepresence robot did not “fix me” or augment my experience to make it more palatable to the able-bodied majority. Instead, it allowed me to make conscious trade-offs between the affordances of my corporeal body and my increased awareness of my cyborg-self in the context of a degenerative auto-immune disease. I am using Haraway’s (1991) feminist STS definition of cyborg, “a creature simultaneously animal and machine, who populate worlds” rather than the AI community’s usage of the term. Haraway (1991) argues that we have all always been cyborgs and focuses on dissolving this animal/machine hybrid. Given that society creates a boundary between able-bodied and disabled in that disability is socially constructed, hers is an appropriate theoretical framework for examining disability. Thus, in this paper I have embraced and explored my identity as a human-computer hybrid; a cyborg. In exploring this boundary, I have learned to take an activist stance on my (dis)ability.

My disability results in profound fatigue, difficulty walking and painful breathing during flares, while at other times I appear wholly able-bodied. The transition between these two states can be gradual or can occur suddenly. Thus, I am simultaneously negotiating my changing experiences as a cyborg and as a person with a disability in concert with one another.

All Beam interactions were documented in short session observation notes or “jottings” in ethnographic parlance (Emerson et al, 1995), supplemented with screenshots of the Beam User Interface. The session observations were extended to provide ethnographic field notes following each session. The data were open coded to explore telepresence use in light of existing human-computer interaction (HCI) theory. I employed an abductive, qualitatively analysis across iterative coding cycles (Emerson et al., 1995) to explore issues such as embodiment, articulation work, agency, and ableism. My analysis ended when I reached theoretical saturation – that is when no new information on usage practice was revealed by further analysis.

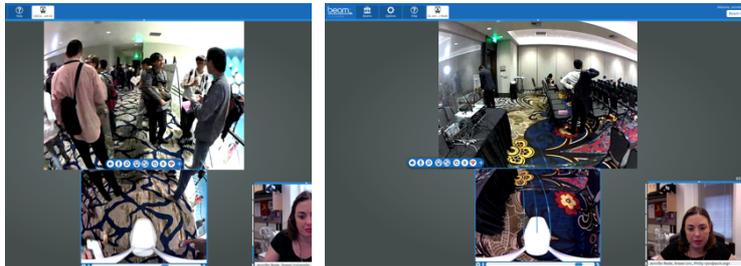
### 3 System Description

The Beam Telepresence system consists of a video screen mounted on a five-foot shaft connected to wheels. As the person who is connecting remotely, I can then drive the Beam as I like and my image is displayed on the video screen. Local attendees can move the Beam only by physically pushing it.



**Fig. 1** (a) U.S. President Obama with disability rights activist Alice Wong. Photo credit: Pete Souza, Chief Official White House Photographer (b) Diagram with sizes of Beam system and docking station. Photo credit: Suitable Technologies

The beam user and local attendees can hear each other via a microphone and speaker. The Beam has two cameras, one at near eye level for communication, and another which is lit and pointed down at the ground to aid with navigation. The user interface allows one to monitor these two cameras, plus the camera on your own computer (see Figure 2 a). One can drive with a touchpad (my preference) through a mouse or USB Microsoft Xbox controller can be used. To aid in navigation, one can plot a planned course in the lower navigation window, so that one can plot your intended path, which is especially helpful on turns.



**Fig. 2** (a) The view from my computer consisting of three windows, described counter clockwise from the top. The large window is the communication camera view. The smaller window is the navigation camera. Finally, the partial window is for monitoring your own camera. I moved it partially off screen, though later learned it could be minimized. (b) Here navigation tracking is turned on in the lower navigation window so that you can see your current planned course. This is especially helpful on turns. Photo credits: author.

## 4 FINDINGS

### 4.1 In the beginning... of “bots and beings”

On my first day as a robot, I felt a bit like a celebrity hounded by paparazzi as I searched for the room holding the first conference session with the aid of a hotel map. Some asked me for a photo, but others took one without permission leaving me feeling objectified and violated. This is akin to Thomson’s discussions of the disabled persons often being a dehumanized object of curiosity (1997). Scores of people photographed me. My disabled body was a spectacle.

On entering the room for my session, a senior colleague, Jane, came up and helpfully attempted to direct me to the “blue box,” a robot seating zone in the back of the room. This area had been designated such that we robots did not tower over the seated fully-human attendees. After the spectacle of my arrival, it was reassuring to come across someone whom I knew. It made me feel grounded and cut through the surreal nature of my experience. It left me feeling that this far off space was connected to people with whom I had once had embodied experiences.

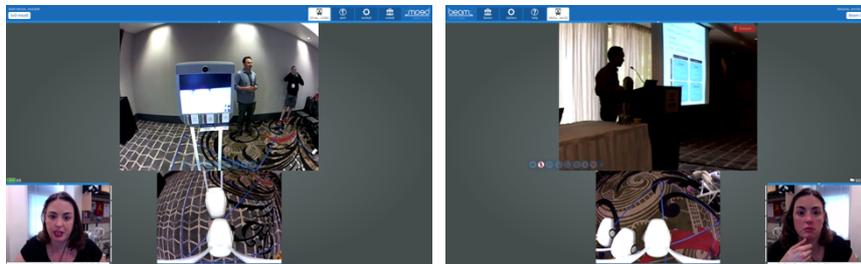
I saw a dear friend, Lawrence, and excused myself, though Jane was concerned that I might not be able to find the “blue box”, which was admittedly hard to see

in comparison to the very gaudy carpet. Lawrence promised he would indeed help me find the blue box. Again, people were watching and snapping photos. I was a spectacle, but really, I just wanted to talk to a dear friend. Lawrence, gently explained that I was “shouting” and estimated that I was speaking at a volume that could be heard from three meters away. I blushed, ashamed of my faux pas, as I learned to regulate my newfound voice in a world where I could not truly hear myself. Finally, I achieved a “reasonably private” conversation and we got to catch up. It was lovely to see him, but as he requested and took a selfie with me, I recognized how the lack of a greeting hug made me aware of my dual body.

Finally, as the session was about to start, I moved to the “blue box”, and encountered my first other cyborg. I had trouble recognizing my colleague, and folks were fascinated by two robots having a conversation and more photos ensued. Later, as I encountered another cyborg, I jotted,

*“Neither J nor I could tell the other was moving so as we approached one another we bumped. It was kind of funny, but awkward. The whole conversation was strained. We do not know each other well, but suddenly had this shared experience and forced intimacy of being ‘bots’ amongst the ‘beings’.” (Fieldnotes)*

As I became more adept at the articulation work (Gerson and Star, 1986) of manipulating my robot body, I gained control of my voice and movements and it became a part of me. While I may have always been a cyborg, I only gradually started to identify with both new limitations and new abilities.



**Fig. 3** (a) Meeting another ‘bot’. Note it is wholly unclear to whom I am talking. Also, note the man photographing this encounter without consent. (b) the “Blue Box” with three Beams watching the speaker. Note the oblique angle rendering the slides impossible to read and the speaker entirely in shadow. Photo credits: author.

I could zip about from place to place and talk to colleagues without the walk tiring me and fatigue making my arguments less crisp.

I could look someone in the eye, rather than peering up at them from a scooter or wheelchair. Since most conversations at my conferences, especially receptions and coffee breaks, occur standing, this was profoundly empowering.

Still, getting from floor to floor was problematic. Elevators act as Faraday cages, causing Wi-Fi signals to be dropped between floors. Ideally, one’s elevator mates would wait for my Wi-Fi to reconnect, so I could drive myself off the elevator and onto the new floor. This is a very considerate thing to do, but often they might only place one’s robot self on the correct floor facing a wall. Then one “wakes up” uncertain of whether you are on the correct floor. Of course, less

considerate (or more oblivious) souls may not let one out of the elevator at all or perhaps place my robot self on a floor at random by accident or out of malice. In a way it is an improvement over clutching the elevator railings for dear life, hoping that the bounce that able-bodied peoples' knees can take does not cause you to topple over. It is certainly an improvement over crawling up or down stairs on one's hand or knees when overcome with fatigue and pain, which at least makes disability visible and allows for advocacy. However, with my robot self, there is the fear of becoming trapped in an elevator and that fear is a new form of invisible disability. Fear of losing one's robot self and getting that dreaded email:

*"Subject: [Beam] Jennifer Rode's Beam has run out of battery  
Jennifer Rode's Beam has run out of battery  
Jennifer Rode's Beam shut down due to low battery."*

Suddenly, one's robot self, one's agency, is cut off. You are stranded elsewhere, unable to return until one's robot body is rescued. This means asking a 'local' to fetch your robot 'corpse' and drag it back to a docking station to be recharged. This is worse than sitting in the hallway of a conference with a busted scooter waiting for the repairman, because without battery you become invisible. It is worse than having to crawl up or down a flight of stairs when the only elevator is broken or on to a conference stage to give a talk when they forgot your ramp. At that moment, all of a sudden crawling does not seem so bad, because at least you can see and be seen.

Sure, in some future incarnation one can hack the beam to ensure there is signal in the elevator, the lack of which is also a problem for able-bodied people using the Beam. However, I use this moment to question the design decision that led to this possibility, a sense of privilege and ableism embedded in its design. My dependence on my robot self is different from able-bodied folks. I send my beam to where I cannot be; it is not about convenience, a temporary disability, or an issue with a visa that may one day be resolved. It is the portal through which I access the world. I am a cyborg and it is part of my sense of self. Thus, perhaps for me and others with disability, stable access to one's robotic body is more crucial and lack of it fraught with more psychological baggage. Telepresence designers in their design decisions need to recognize this in order to not privilege the needs of the casual able-bodied convenience user.

## 4.2 Embodiment & Handless Feeling

I have no hands as a robot. I can attach things to my body—a Wi-Fi signal booster, or a basket to carry things. However, I cannot I knock at a door the way a physically present able-bodied person would. In the beginning, I would stand helpless at a door and wait hopefully for someone to open it. Later, as I gained control of my robot self I would peer about, swinging my robot body in a circle to look for someone to ask for help. In the years since the conference, I have mostly perfected what I call the *whole-body robot knock*. One throws one body against the door as gently as possible, in an attempt to mimic a corporal knock. Usually, it works. Though occasionally my hand slips on the controls, or perhaps my arthritis acts up, and I end up startling the room's occupants. That seems rude and

unfortunate, but I do not have hands. Even a gentle knock will startle someone who is not familiar with the whole-body robot knock. So even now I still find myself standing helplessly by doors, waiting.

Once I make my hopefully not grand entrance, there is the question of greetings. I cannot shake hands or hug when greeting someone. So, greetings seem cold. On occasion, I've made very gentle contact with someone—knocking them gently. You see just as Vertisi (2008) discusses, “Seeing Like a Rover,” you can feel as a Beam. When I hit something, intentional or otherwise, the bottom of the robot stops abruptly, but the camera seated at the top of the robot, my portal to the world, continues forward until the center of gravity jerks it back. When this jostling of the camera occurs unintentionally and my attention is wholly immersed in my virtual presence, I find myself jerking my head back as the camera goes far too close to a door or other object and the hairs on my arms bristle. It is not painful, but the experience of hitting something remotely is none the less embodied. Consequently, there are opportunities to play with this seamful interaction (Chalmers and Galani, 2004), this sense of *handless feeling*.

Dourish (2001) discusses *embodied interaction* as the site where humans interact with computer systems which “occupy our world, a world of physical and social reality, and that exploit this fact in how they interact with us” (p3). Dourish’s theory well predated robotic telepresence, but can be extended to remove the duality between computer and human, and by extension the Cartesian duality between body and mind. Thus, *handless feeling* is a way I have developed to allow for embodied interaction by re-appropriating the technology in ways that I am sure the designers did not entirely intend.

Further, one can have an active embodied physical presence in this other space, especially as my telepresence robot has no proximity sensor or safety override to slow it down as I approach an object or person. Experimentation ensued; what could I do? I learned that with maximum speed, momentum and a little skill, I could push a chair across a room. Thus, when talking to a close friend or colleague who says something playful, I have the option of gently nudging them, the way one might faux box someone. There is then a realization that one could be violent, even if it is only intentionally running over toes. By extension a greeting could become embodied; gently coming into contact with another can create a mediated sense of physical intimacy.

On a more recent occasion in the last year, the video signal on my robot was lagging somewhat, such that my projected human movements on camera became a bit jerky, though my robot self was standing stationary. We were waiting for an event to start, and a well-meaning colleague proceeded to tease me for several minutes while by performing a jerky robot movement much to the amusement of her onlookers. These were increasingly close to the camera and violating my sense of personal space, or should I say *cyborg space*. At some point, I felt a bit objectified, mocked for my robot self and technical limitations, and she just was uncomfortably close. After briefly considering whether I had adequate bandwidth to safely do so, I decided to assert myself. I very carefully and gingerly moved my robot self, *very* quickly to what I believe to be about two inches forward, and then abruptly stopped, abruptly invading her personal space. My colleague jumped back with a shriek of frightened surprise and then joined the rest of my colleagues

on both sides of the camera and laughed heartily. I might have limitations as my robot self, but I still have agency and in doing so I reasserted my humanity.

### 4.3 Agency, Embodiment and Comings and Goings

One aspect of life as a cyborg with limited agency is with regards to the circumstances under which you enter the room. On my second occasion using the Beam, I arrived in the room where Beams were docked. The room was also the headquarters for the conference staff, and thus was secure and large enough to store a half dozen Beams. I entered the room to discover that I had crashed a birthday party for one of my senior colleagues. They had just wheeled in the cake which was blocking my exit from the room. There was a mixture of shock, laughter, and uncertainty. I felt extraordinarily rude crashing the party; after all I was not invited, and everyone else were senior members of the Ubicomp program committee. Still telepresence requires adapting as social norms are overturned inadvertently, so after an awkward moment I jokingly offered to take a “Beam selfie” with him. I joined the party singing Happy Birthday. The guest of honor cut the cake, and going with the obvious joke I was immediately offered a piece, which I politely declined. I felt rude not being able to accept, but we laughed. As the serving trolley moved about the room to allow the cake to be served, it no longer physically blocked me from moving. I made my polite excuses and left.

This conversation as to whether I would like cake momentarily made me realize that while my senses of touch and sight extended to my experiences in Seattle, my senses of taste and smell were still rooted firmly in Philadelphia. I felt momentarily torn, embodied in neither place. I love cake, yet I could not smell the vanilla frosting. Nor could I take a bite of cake that looked truly delicious. Consequently, my sense of immersion shattered. Further, while it was truly funny to remark on my inability to eat, and it was well intended levity attempting to smooth an awkward social situation, nonetheless it was commentary on my disability. I was handless, and I could not eat. I was other. Again, while my physical disabilities were augmented with this new technology, I encountered new disabilities by choosing this alternate cyborg form. This is in line with Herring et al.’s research (2016) that discusses how even able-bodied persons in telepresence robots are treated as somewhat disabled. In that way, I was not that different from an able-bodied person using a telepresence robot. While at the same time realizing that I was oversensitive, I also recognized some new form of corporeal-ableism at the core of this interaction. Yet, while I cannot become able-bodied, I recognize my new-found ability: I can select whether to attend an event in person or as a cyborg in essence select the forms of disability I wish to present to the world.

I, similarly, had little control on when I left a social interaction. On one occasion, I was being interviewed about my experience using a telepresence robot, and mid-interview my Wi-Fi connection dropped. Suddenly, I was transported from my embodied world in Seattle and back to Philadelphia. When talking to the reporter, I had borrowed a colleague’s robot as mine was having technical difficulty. In my hurry to get back to the interview, I logged back in to the wrong

robot. Consequently, rather than reappearing in the robot right next to the reporter, I logged into one back in the conference chair's room. As I rolled back to the reporter, I startled her. The poor woman shrieked audibly, and commented that I startled her. I felt like I was playing one of those role-playing video games where I had to visit my corpse to restart the game.

Again, this reminded me of the fragility of this form of communication as a complement for my disability. I was dependent on the internet and ultimately on a link that lacked any tangible form. This fragility made me feel intensely vulnerable, as it mediated my presence at an academic conference, where interpersonal networking is crucial for my professional status and ultimately the perception of my reliability as a colleague.

## 5 Conclusion

In this essay, I have reflected on my initial experiences using telepresence. I have engaged in a tremendous amount of articulation work to try to make this tool work for me. In some ways, the technology affords me significant newly found freedoms and in others is profoundly restricting. I strive for an embodied experience and while I have developed a sense of *cyborg space* and *handless feeling*, in other instances the immersion can be broken and I become painfully aware of my physical separateness. Further, issues of agency and ableism become conflated as in some ways technical limitations can reaffirm and even create new forms of disability. As more and more computer science conferences allow this form of 'attendance,' we need to consider the social implications for those of us with disabilities. Further, in some instances I have seen remote participation being used as a way of accommodating disabled persons, instead of ensuring the actual physical space is accessible. Technology, then, can be used to reify these new forms of cyborg disability.

Throughout this experience I have become a cyborg. Disability studies scholar, Tobin Siebers (2008), theorizes disability as a minority identity, and challenges readers to consider embracing it as a positive, writing,

*To reverse the negative connotations of disability... it will be necessary to claim the value and variety of disability in ways that may seem strange to readers who have little experience with disability studies. But it is vital to show to what extent the ideology of ability collapses once we "claim disability" as a positive identity (Linton).*

He argues doing so improves quality of life for disabled people (Siebers, 2008). Thus, by acknowledging I have become a cyborg, I am making a political statement. It requires a tremendous amount of articulation work to deal with the technology limitations and stigma of disability, both present in everyday life and in the design of the technology itself (which itself create new forms of invisible disability). By embracing the positive aspects of my disability and becoming a cyborg using telepresence, I am afforded a new form of an activist disabled identity. Managing it requires negotiating issues of presence, embodiment and agency, which as I have shown need to be re-theorized to fully consider this new type of hybrid disabled cyborg identity. While this essay has not presented solutions, it provides clear illustration of problems with articulation work to

ensure embodiment, agency, and ableism. As we move forward with the development of telepresence the issues of social justice for the disabled need to be carefully considered.

## 6 Acknowledgements

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