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Technology and Discrimination[1]

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Langdon Winner's famous article, "Do Artifacts Have Politics?" (1980), must be the first thing mentioned in any discussion of what philosophy of technology has contributed to our understanding of discrimination. The examples addressed, most of all the famous 'racist bridges' of Robert Moses—built low in order to specifically exclude New York City buses, and the kind of person more likely to be using public transportation, from certain beaches—make clear that artifacts can be said at least to have political effects, including advancing racial discrimination.

Winner's work has been highly cited, and rightly so, but it is not a full theory of *discriminatory technologies*, and it is not grounded in multiple theoretical perspectives in order to maximize its applicability within the field. In the following, I will develop such a theory, connect it with Heideggerian, Latourian, and Ihdean theoretical structures, and demonstrate its applicability to a wide and widening range of forms of normativity, exclusion, and discrimination.

First, it must be asked what it would be to have a full theory of discriminatory technologies. Next, it must be asked what we are to make of the idea of a "discriminatory technology." Following this, we may approach these three theoretical groundings in order to provide support to the theory and to provide direction in seeing what kinds of artifacts it can help to identify and understand as technologies of discrimination.

What would be a Full Theory of Discriminatory Technologies?: The Ontology of a Band-Aid

Richard Dyer (1997: 41) prompts us to consider the Band-Aid as a paradigmatic example of normative whiteness. His work in this famous book, *White*, seems to me among the finest examples of the field of Cultural Studies one could find. What philosophy of technology can add to this is a movement from reading the artifact as a text to looking at the way the object is concretely active in the construction of exclusionary normativity.

Band-aids come in a variety of shapes and sizes, showing their responsivity to a variety of contexts of use. In Floridi's language, it needs to have the right protocol to fit its prompter—in this case, the minor cut in the skin. This is why it is made to minimize infection, with a mesh to discourage adhesion to the healing flesh, and available in different sizes in order match up right with the naturally occurring diversity of bleeding gashes.

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There are limits to the diversity of adhesive bandage sizes and shapes, however. Three sizes to a pack is good enough to cover most cases satisfactorily well, and we recognize it would be unreasonable to expect just the right bandage for each particular wound. Only having a single size is not responsive enough to the relevant cases; having a dozen different sizes in every box is far more responsivity than is necessary, and would likely result in a bunch of odd shapes and sizes that would pile up in half-empty boxes accumulating in the corners of our medicine cabinets, eventually to be discarded.

The invariance of the color of adhesive bandages, until relatively recently, places significant variance from 'white' skin in this same category of irrelevance. Dark skin is apparently a prompter to which it is not necessary to design the protocol to respond. This may be an effect of "color-blindness": that the (white) product designers failed to consider that "flesh colored" might not be the same thing for everyone. Although exceedingly unlikely in this particular case, this could be an effect of conscious discrimination akin to Moses's bridges, where the designers specifically chose to design a whites-only product. This could simply reflect the reality of the market, where a color is chosen that will match best for the largest set of similarly-colored consumers. In any case, the ontology established by the object is the same: the function of the bandages color is to match the skin; when it fails to do so, it implicitly claims that *this* flesh is not "flesh colored." The proper function of the technology contains within it an ontology which already may define some persons as normative and others as lesser or deviant others.

A full theory of technologies of discrimination should engage with technologies at this level— not by reading them as texts, not by producing analyses of particular effects or even kinds of effects of technology, but by theorizing how those technologies embody, transmit, and produce ontologies of normativity which result in privilege and discrimination.

What is a Discriminatory Technology?

Without saying anything too contentious about a proper definition of "technology," we can perhaps say that a common-sense description might be that a technology is a way to get something done. By speaking of a 'discriminatory technology' we must mean a way of getting something done which produces a discriminatory effect.

By speaking of "discrimination" we clearly do not intend the word in the sense in which a gourmand has "discriminating taste," although the two senses are related. Discrimination in the political sense has to mean something like 'when a morally irrelevant characteristic is allowed undue influence in a determination of individual or distributive justice.' For discrimination of this political kind to take place, there must first be discrimination in the amoral sense of drawing distinctions—in this case, distinctions between persons.

This may seem to be a trivial conceptual point: of course a distinction must be first made before it can be given undue influence. But this point is of deep and historical consequence, for, arguably at least, the most prominent way that discrimination has been overcome is not by equalizing the judgments made about one group who has been distinguished from another, but instead by ceasing to make the distinction between these groups to begin with.

We see this in the history of the meaning of "white" in a racial sense. In the colonial period, we find records of blacks and Irish rising up against whites, although today we consider the Irish to be white. The Polish have similarly and recently disappeared as a category distinguished from "whites." Hungarians and Bulgarians, in the mid-20th Century, were subject to racial slurs ("bohunk," "hunky") largely unrecognizable today to the people that these words were meant to other and to denigrate.

Religious and language differences play at least as much of a difference as more distinctively race-related in determining who counts as white. In European history, Spaniards and Italians have not always been considered white, especially those of Muslim faith. As Dyer points out (1997: 42), Jews seem to have been considered black for some time, and only became white in the latter part of the 20th Century. Semitic persons, especially when Muslim or immigrants, are Caucasian but nonetheless are often not white—the same is true of Latinx, especially when English is a second language.

What then is it to be white? The approximate answer from critical race theory is that being "white" just means that it is not noted in any consequential way that you are raced at all. If you are encountered in the context of a racial identification, you are a person of color (PoC); if you are not, you are white. In this way we see that identification as white is a lack of judgment rather than a concrete claim: that you are white means nothing besides that you have not been identified as something else.

This judgment requires training—just as does having a discriminating palate. The way in which formerly non-white persons become white involves a decrease in the weight placed upon prejudicial claims against the minority in question, but it also involves a decrease in the amount of training people receive in identifying those persons as a group in the first place. The Nazis produced materials specifically designed to help whites to identify and out Jews, but much more innocuous racial caricatures, as in e.g. political cartoons, play a similar role.

This is why status as white or PoC is a matter more of how we are interpreted rather than a matter of fact, although matters of fact form the basis of any interpretation, and certainly can limit the range of interpretation available. Someone of mixed race may pass as white and identify as white, and have no idea that they have non-white ancestors. A person of European descent with curly hair may be darker-skinned than a person of African descent with straight hair, but we have been trained to interpret racial cues in such consistent and nuanced ways that there may be little or no controversy about the whiteness of the former and the blackness of the latter. Many people, including myself, are raced differently in different contexts or when wearing clothes or hairstyles with or without ethnic markers. Few people today are raised in environments in which they are trained to recognize my features or my surname as racial markers—but some are. To most, I am white, but I have been threatened with violence by white racists for my non-white identity.

This is what we mean when we say race or gender are socially constructed: that they are the product of human labor, manufactured using some physical basis, genetic and phenotypic, but

reducible to or determined by that basis in only the same kind of limited sense that other manufactured goods are reducible to or determined by their raw materials.

An invisible starting point in our encounter with one another, prior to the construction of difference, was described by Heidegger (1996) as *das Man* ("the One," or "the they"). By "the One" he means only to indicate the approach to others named by the word "one" in phrases like "one doesn't do that." The "One" who does this or doesn't do that is no person in particular, or even a description of a variety or totality of actually existing persons, but is instead a set of expectations we are trained to have, on the basis of which we judge others and ourselves. The One is normativity of all kinds: One is kind, One doesn't tell lies, and One sets the table with the fork on the left of the plate and the knife on the right. And one is called to account when one doesn't do what One does!

Heidegger describes the normativity of the One in terms of an "average everydayness" which requires a "leveling down" on our parts (1996: §27). It is, in his account, easy enough for us to fall into the One; to live our lives as One does and to believe what One believes and remain free from having to come up with our own values, judgments, beliefs, etc. Our care and anxiety before our own death may shake us loose from our fallenness into and entanglement with the One, because what One does and what One believes offers us no consolation before or explanation of the necessity of our own death. The need to come to terms with our own death forces us to try to make sense of our lives, and that, in turn, forces us to actually try to develop some idea of what we should do with our lives and why any of it matters—and this is what Heidegger means by authenticity: to figure out for ourselves what to do and why (or die trying) rather than remaining lost in the One.

Heidegger fails to recognize that the One is constructed in ways which are directly exclusionary of many or most people, making the worry about falling into the One and failing to confront one's individuality much more relevant to straight, white, cisgendered, affluent, Christian men than to the rest of us, who are reminded more or less regularly of our non-conformity with the One. Du Bois expressed this phenomenologically in the famous opening of *The Souls of Black Folks*:

> the negro is a sort of seventh son, born with a veil, and gifted with a second sight in this American world,—a world which yields him no true self-consciousness, but only lets him see himself through the revelation of the other world. It is a peculiar sensation, this double consciousness, this sense of always looking at one's self through the eyes of others, of measuring one's soul by the tape of a world that looks on him in amused contempt and pity. One ever feels his two-ness, —an American, a Negro; two souls, two thoughts, two reconciled strivings; two warring ideals in one dark body, whose dogged strength alone keeps in from being torn asunder. (1994: 2)

Why is double consciousness part of the black experience, but not part of the white experience? It is tempting to say that the white experience is relevant for everybody to consider because of the wealth, power, and majority status of whites, but this is incoherent. There is no white experience, just as there is no "whiteness," only a lack of being raced. We must say instead that those who are regularly and predictably raced must consider themselves both as persons (as One)

and as persons who One identifies as Other; as subject to normativity, but also as always already deviating from norms. One is not black; One is not a woman; One is not gay; One is not transgender; One is not poor; etc. etc.

Here, of course, we deviate from the ordinary language use of the theoretical term "One," but the "averageness" of white/male/straight/etc. normativity in the sense of the "One" can be seen quickly enough in countless everyday examples. The German term "das Man" is clearly enough gendered, and parallels longstanding English cognate usages, such as using "man" or "mankind" to refer to all humans. Here, of course, we can't say that the view of male as "normal" and female as "different" can be accounted for by majority status, since women comprise approximately the same proportion of the species as do men. Regarding sexual orientation, we might consider the question, "when did you choose to be straight?" This question, of course, is never asked because our images and stories establish heterosexuality as a default condition. The effect is perhaps most striking when the population matching the One is clearly a minority, as in the body shapes and sizes which are treated as representative of femininity and masculinity in our fashion magazines and films.

As the hammer disappears in our experience of the work, integrated with its system of objects to which its affordances are tailored, so too does a normative embodiment appear to us as ready-to-hand. Only when the hammer is broken, in Heidegger's famous analogy (1996: §15–16), does the artifact become present-at-hand as an object to be perceived. So long as the hammer is working, we have questions only about our projects and purposes along with it—once it is broken, we need to ask how it's supposed to work, and why it had been put together this way rather than some other way.

The normativity of the One is found in the obtrusiveness of persons rather than artifacts when there is a mismatch—to find oneself as Other rather than One is to have this mismatch attributed to one's own brokenness rather than the object's. The native English speaker, in countries where One speaks English, can wonder why One has to 'Press 1 for English". The "overweight" airplane passenger, however, is more likely to blame herself rather than the seat when it cannot accommodate her bulk. And to return, now, to the band-aid, it is because One is white that the dark-skinned user doesn't simply say "They made this the wrong color," but feels instead that she is the wrong color. The presence-at-hand of the artifact indicates a brokenness, a mismatch between the object and its application; the normativity of the One informs us of on which side of the relation the fault lies.

With this, we can now offer a definition of *privilege*: Privilege is the invisibility of our attributes caused by their fallenness into the One, which invisibility prevents these attributes from being perceived as meaningful. To have privilege means that the starting assumption, when something goes wrong, is that it is the world rather than the self that is broken; to lack privilege means that this, at a minimum, is not assumed.

This is why Peggy McIntosh's (1989) influential account of privilege as tools in an "invisible knapsack" is often off-putting to those who are most privileged: the tools of privilege disappear entirely to those for whom they are ready-to-hand. These aspects of privileged persons are not well-designed hammers or properly-colored adhesive bandages, but are so integrated with the

One that they do not appear as tools at all. For this reason and within this Heideggerian theoretical context it is more useful to think of privileges not as tools for getting things done, but instead as the failure of our attributes to appear at all; as our pre-determined belonging to the One.

And, now, to bring this together, we have seen that a precondition to discrimination is the drawing of distinctions. Privilege is when these distinctions do not appear, and the invisibility of whiteness and masculinity and Christian faith and so on is produced by their averageness; their fallenness into the One. Where these distinctions do appear, when they are present-at- rather than ready-to-hand, they are subject to being treated as having explanatory power, leading to discrimination in a political sense.

Let us now answer the question: "What is a discriminatory technology?" A discriminatory technology, so long as we understand technology in its broadest sense as a way of getting something done, is a method by which we background some set of attributes and foreground others, causing some attributes to disappear and become transparent and others, by contrast, to stand out. These technologies—or, techniques, if you prefer a narrower definition of "technology"—may include language, images, stories, policies, and objects.

Philosophy of technology is concerned with techniques—technology in its broadest sense—but it is also and especially concerned with artifacts—technology in a narrower sense. Having established a general theory, we can now go on to look at discriminatory artifacts.

Discriminatory Artifacts

We do well to listen to the wisdom of objects. The subtleties of the traditional size and shape of the hammer's handle contain within it a knowledge of how best to hold it, and weights it well so that the artifact disappears into the user's experience of control and precision, even when that shape is transmitted through manufacturers who merely imitate its form while unknowing of its function. But objects can contain and transmit prejudice as well as wisdom, and the hammer which, through its generations of traditional manufacturing, has come to conform itself to a man's hand may, just as unknowingly, bring a feeling of awkwardness rather than authority to users with smaller hands and lithe fingers.

This occurs not only through artifacts that have discriminatory outcomes, as in Winner's case of Moses's racist bridges, but through artifacts that establish exclusionary norms. Technologies can embody discriminatory presumptions through a Latourian delegation (1992, 1999), where social values are enforced through material implication, surviving through replication of design long after their designers unthinkingly built their discriminatory values into the objects. Carpenter's tools were built for men's hands because men were carpenters—those tools, though, have become discriminatory because our tools, unlike us, continue to act as if they believe that One does not build houses if one is a woman; they make the job easier for men than women, rendering to (most, larger-handed) male carpenters an unearned privilege and to (most, smaller-handed) female carpenters an undeserved disadvantage.

Embodiment technics

This represents a discriminatory effect delegated to artifacts in an embodiment relation to the world, in Ihde's sense (1990). Embodiment technologies allow the user to access or affect the world by withdrawing into the user's experience of self. Perhaps the clearest example are corrective lenses: a good pair of prescription glasses should reveal the world while themselves disappearing from our experience; a pair of glasses that we notice constantly isn't a good pair of glasses for us. Another example is clothing, which should allow us to experience our environment in a pleasant manner, making the experience of the clothing disappear. Ill-fitting shoes or clothes which are too heavy or too light for the weather fail to disappear from our experience in the way they should.

This withdrawal from experience produces an "enigma position" between the user and the technology. Because the user experiences the world as part of a human-technology hybrid, when something goes wrong, the user must decouple herself from the technology in order to ascertain where the breakdown has occurred. When our vision is blurry, we take our glasses off and clean them; when the blurriness remains, we remove our glasses again, but try rubbing our eyes instead.

The hammer which fails to withdraw into the practice of carpentry indicates a problem. It feels too heavy, or badly weighted. It is awkward. But if it is a standard design, and seems to be a good design for One to work with, we are likely to think that the fault lies with us rather than the object. And so the woman using such a tool is more likely to think that she's not good at what she's doing rather than that the tool isn't good for her.

The adhesive bandage is another example of discriminatory object in an embodiment relation: it is designed to be the color of One's skin, but fails to withdraw from the dark-skinned user's perception.

Strollers enforce regressive gender norms through a breakdown in embodiment relations as well. They are made for their average (female) user, being uncomfortable and obtrusive to most men and to tall women. In my experience, I found that not only were stroller handles too low for me to use comfortably, but the brakes on the rear wheels of our stroller were placed so that I had to train myself to take smallish steps—my natural stride made me step on the brakes by mistake whenever I started pushing the stroller at a moderate pace.

Kitchen counters are similarly designed for the average woman's height. By placing these average gender differences into design, these activities are made more difficult for men, and so tend towards remaining women's work. Our attitudes change with the times, but the attitude written into our objects continue to make regressive claims about what One ought and ought not to be doing.

Imaging technologies provide a series of illuminating examples of discriminatory embodiment technologies. In the realm of 3D imaging, new media theorist danah boyd (2014) has pointed out that constructing an immersive virtual environment through motion parallax depth cues works well for most men, but poorly for most women, because of differences in how most women's and most men's brains process visual information. The reliance of most virtual reality systems on

motion parallax systems thus produces a sexist effect, where most men are able to be virtually embodied in virtual worlds through e.g. Oculus Rift, but most women are excluded, unable to allow their bodies to disappear into virtual embodiment due to the nausea that motion parallax imaging often produces in their physical bodies.

Lorna Roth (2009) has written an excellent media history of the "Shirley Card"—a standard photograph used to calibrate photographic printing equipment. Until the 90s, the standard Shirley Card depicted a white woman, and photo labs calibrated to print her face with good clarity and contrast, leading to generations of poor photographic representations of dark-skinned persons, where black faces and bodies sometimes appeared as shadows or blots with few distinguishing features other than white teeth and eyes—not just in the media, but in family snapshots. Compounding this is that even the film formulations were directed toward accurate reproduction of white faces, to the extent that Polaroid produced a specific camera for the apartheid South African government in order to produce identifiable ID card photographs of black citizens, featuring a "boost button" that would increase the lumens of the flash by 42%; the average increased amount of light absorption of black African skin (Smith 2013).

Roth describes this as "dysconscious racism" through a "technological unconscious" in which "a global assumption of 'Whiteness' [was] embedded within [photographers] architectures and expected ensemble[s] of practices" (2009: 117). A substantial change in producing less discriminatory photographic formulation was the 1995 commercial release of Kodak Gold Max, which was referred to as being able "to photograph the details of a dark horse in low light" (Richard Wien, Executive, Kodak, Rochester, NY, personal communication, August 18, 1995, quoted in Roth 2009: 121–22).

In these cases, the embodiment relation of the photograph, where the photograph allows us to see an image as if we had been there in the place of the camera, contains a racist overlay delegated into its technological unconscious, making black people appear darker and more indistinguishable or interchangeable; a racist way of seeing strongly resonant of the conscious racist depictions of black people through minstrel shows and the Little Black Sambo and Mammy stereotypes. Through a technological version of DuBois's double consciousness, this racist representation was even reflected back to dark-skinned persons, with family and self-portraits becoming a distorted funhouse mirror in which they saw themselves not as they would appear when stretched tall or squashed short, but as they would appear to a white racist gaze. It is thus unsurprising that PoC view selfies in an age of Instagram and digital filters as liberatory and empowering in a way that may not be apparent to whites—our technological assemblages have long been oriented in order to reflect whites' faces back to them as they see themselves, but the new level of control and authorship in digital photography has allowed PoC to appear before any viewer of their selfie in accord with their own self-perception. Prior photographic technologies made the One's gaze racist; the digital selfie can allow One to gaze upon the PoC's selfie without the racist filters of the past.

But the One formed through delegation into the technological unconsciousness still embodies a racist gaze in other ways. Facial recognition software is still sometimes, perhaps often, programmed to work according to contrast recognition algorithms which are calibrated to white faces and fail to recognize blacks as persons, as demonstrated in one viral video entitled "HP

computers are racist" (2009). In classroom discussion, a student shared a similar experience with me: he worked in a grocery store where employees clocked in and out using fingerprint recognition scanners which, he said, regularly failed to recognize his black co-workers. In another similar algorithmic misrecognition, Google Photo's image recognition software— presumably not properly primed with enough images of PoC and not programmed properly to recognize humanity through universal human rather than white human attributes—automatedly tagged black people as gorillas (Mullen, 2015). The effect of the technology is to construct black persons as non-persons: in some sense it is obviously right, despite the anthropomorphism of the claim, to describe such technologies as racist, for they fail even to notice the existence or the humanity of some persons on the basis of skin color.

To avoid creating discriminatory technology, it is insufficient to ensure that we do not build in racist/sexist/etc. values, for the One which we design for places statistical regularities into the architectures through which we act in the world, and so enforces those regularities upon those minorities to whom they do not apply. To have a technological unconscious which does not exhibit bias, we must take affirmative action to include minority bodies in our design spaces so that embodiment technologies fit with the diversity of user bodies. Non-discriminatory technologies require not just designers who are not bigots, but designers who are actively anti-racist, anti-sexist, anti-ableist, anti-transexclusionary, anti-heterosexist, and so on, because the averageness of the One will always be exclusionary of difference.

While this in no way exhausts or systematically covers ways in which embodiment technologies can be discriminatory, the most we can hope to accomplish in a chapter of this length—or even of ten times its length—is to address patterns and kinds of discriminatory artifacts. Ihde's division of kinds of human-technics relation provides useful structure in ensuring that we cover different sorts of such artifacts, and so, incomplete as our coverage of embodiment technologies must be, we will move forward into what he addresses as "hermeneutic technics" (1990: 80).

Hermeneutic technics

Hermeneutic technics represent a part of a world to a user in such a way that the world is represented by rather than seen through the technology. Ihde's phenomenological variation regarding the thermometer provides a useful contrast between embodiment and hermeneutic technics (1990: 84–5). An embodiment-based thermometer can be imagined: a metal strip going through a wall which would transfer heat efficiently, so that one's hand could be placed on it in order to feel temperature, hot or cold, as if one's hand were outside rather than inside. The thermometer as we know it, though, does not transfer an experience to the user, but instead translates information about the world into a different non-isomorphic format, where it can be "read." The "what-it's-like" of 30º is phenomenally non-obvious and must be learned by rote, just like the "treeness" of the written word "tree"—and, indeed, Ihde identifies written language as another hermeneutic technology.

In hermeneutic technologies, it is not the technology that disappears into the user's experience of the world, but the world which disappears into the user's experience of the technology, forming an enigma position between the technology and the world rather than one between the user and

the technology. When the "check engine" light comes on, for example, we know that there is either something wrong with the engine or something wrong with the "check engine" indicator itself, but we don't know which until the engine is decoupled from its representation and each is investigated separately.

Hermeneutic artifacts can become discriminatory when they fail to properly represent a person, or when they represent a non-human part of the world in a way that systematically excludes minority ways of understanding the world.

In the former case, we can think simply of the common understanding of the words "woman" and "man" as attached to biological sex markers, such as genetics. Insofar as we feel the need to identify a transgender woman, for example, as a trans-woman, we assert that if One is a woman, one is cisgendered, and thus that a trans woman is both woman and not-woman, and another form of dual consciousness is constructed. This is made clear by the need for the term "cis woman": if "woman" is the general term, and "trans woman" is taken to be a subset of women, then we need another word for the remainder of the set of women—otherwise transgendered women are conceptualized as not "really" women, for they are not in the subset of women$_1$ (in the general sense) who are women$_2$ (in the sense of not being trans women).

The seeming objectivity of technical artifacts creates the normativity which makes this failure to capture difference discriminatory. Consider for example the résumé as a hermeneutic technology. A résumé represents a person through a well-defined set of filters, through which much of one's life is excluded in order to provide efficient evaluation of candidates based (ideally) on only relevant characteristics. But what the same qualifications and years and kinds of experience represent in lives as they are lived can vary widely. Gaps in employment are often viewed unfavorably, as they are often taken to mean that a candidate has difficulty holding down a job. These gaps may indicate that a potential employee is unreliable, but they may instead indicate that the applicant left the labor pool for some time in order to raise or even simply to bear children—and this more favorable possibility applies more often to female rather than male applicants. Similarly, much stock may be placed in the reputation and name recognition of an applicant's degree-granting institution, disadvantaging applicants who attended historically black colleges and universities (HBCUs) which may be less well-known to white managers than similarly-distinguished and high-quality non-HBCU institutions. In these ways and many others, the seeming-objectivity of the hermeneutic artifact—in this case, the résumé—conceals the white/male/cis/ableist normativity of the applicant who it is designed to objectively represent.

Hermeneutic artifacts may also interpret parts of the world other than persons in a way which has discriminatory effects. The standard school and business calendars are obviously discriminatory in the way that they are organized around Christian holidays in majority-Christian-faith contexts. While it is a matter of practicality to plan around those days which most employees, managers, teachers, and students will wish to have off, the effect is to construct a set of holidays which One celebrates. Calendars are then invisible to Christians and opaque to those of other faiths, with barriers constantly and annually placed in between their organizationally-provided schedules and the schedule of their faith practices. The non-Christian of faith must out herself and request allowances to live her life in accord with her interpretation of the world as a place of religious observance; the Christian need only decide whether to practice or not, for her world is largely

organized to provide the opportunity. It is striking that "Spring Break" for many public schools in the secular United States is moved year to year to correspond with Easter.

The discriminatory nature of the artifact of the calendar is clearest with Christmas, where it takes on additional complications. When non-Christians reject the dual consciousness of being expected to celebrate holidays which they do not celebrate—going to "Christmas parties" at work and smiling and saying "you too" when wished a "Merry Christmas"—this is described as an attack in the "War on Christmas." Amazingly, there is an entire genre of "entertainment" dedicated to naming and shaming as "Grinches" and "Scrooges" those who fail to be appropriately enthusiastic about a religious holiday that One celebrates, but which a very large and diverse portion of the population of secular nations do not celebrate. At the same time as pressure is exerted on all persons to participate in Christmas as a universal holiday, religious minorities' inclusion is disallowed by the fight to "keep the Christ in Christmas"—to maintain its character as a religious holiday, even as those who are not Christians are expected to celebrate it.

Hermeneutic technics construct reality as One lives it as reality itself, leaving many to live in the world of their own experience with an overlay of life as lived by the One from which they are excluded, a part of a social reality which consistently fails to recognize and reflect their world.

Alterity relations

Ihde's category of alterity relations (1990) with technology are of a different kind than embodiment and hermeneutic technics: here, the artifact does not mediate a relation between a user and the world, but instead the user interacts with the technology as such, and the relation of the technology to the world is not of central importance to that interaction. To some extent, any media representation of persons is an alterity relation: for example, the disproportionate representation of minorities as criminals in television programming. We don't take this representation to be representative, and its function is entertainment rather than truthful and accurate representation of reality. There is however an obvious spillover effect: it would be wrong to criticize any particular story for choosing a PoC as antagonist, since it is just a story and makes no reality claim, and yet a society in which black people are seen regularly on the screen with weapons is a society where police officers are more likely to think, in the heat of the moment, that the thing a black citizen is holding is a gun rather than a cellphone.

These cases having to do with media representation are, however, already well covered in other fields, and particular media objects don't clearly fit a common-sense definition of technology as a way of getting something done. A crossover case might be the rightly-controversial sometime use of mugshots for police target practice, which reinforces racial disparities in assumption of criminality and use of deadly force against minorities already subject to disproportional police attention and aggression. But the widest range of alterity technics that affect how we think of ourselves and others is in gaming, where we interact with virtual persons in complex and rich ways.

In games, female characters often have exaggerated secondary sex characteristics, are otherwise slim, and wear revealing and impractical outfits. But the form of interaction which gamers have

with and through them establishes a deeper set of troubling norms as well. Female characters are often in support rather than lead roles, cast as magic users, healers, rogues, and archers. Exceptions abound, but women are more often heroes insofar as they allow the predominantly male characters to succeed, and do not as often succeed on their own or with support from male characters. When male characters act as support, it is often as "tanks" whose physical toughness allows for frail "glass cannon" characters to survive long enough to be effective. Women, then, who choose to play female characters must often enact the idea that women are secondary to men, whose excellence comes from their ability to allow men to triumph—and women who play primary roles, being supported rather than supporting, often do so in drag through male avatars. Male gamers, of course, play as female avatars as well, and role-play reinforces the same message to them: being a woman usually means being a helper, and being a helper usually means being a woman.

It's worth emphasizing that the point is not that this is how these characters are depicted, but how they are enacted. Female support characters may be strong and confident and have their own stories, and male lead characters may be muscled and scantily-clad cardboard cutouts, but the mechanics of play often contain a clear script of male primacy, and success in the game requires adopting and acting out this view of gender roles.

This is an alterity relation insofar as we are interacting with avatars on their own terms—these dynamics are present whether or not male lead and female support characters are played by male or female gamers, and very often the gender identity of other players is not known, or the game is played with the gamer controlling a team of variously gendered avatars on her own. And although here we interact with avatars through an alterity relation, gaming also represents a kind of embodiment relation insofar as we enact our purpose in the game through the avatars, and skillful masculine and skillful feminine action is encoded in a way that reinforces gender bias.

Background relations

We can address a final category in human-technics relations from Ihde (1990)—background relations—in which the technology forms an environment to other interactions but disappears entirely from the user experience. Air conditioning, controlled by a thermostat, is a clear and paradigmatic example.

Innumerable sorts of online algorithms present background relations that have discriminatory effects. These algorithms determine what we see online in a way which is entirely inaccessible to user knowledge or control, and, further, most users are not even aware that what they see is different in an important way from what others see.

Eli Pariser (2012) has written about the "filter bubble" as a way of understanding the customized internet; Cass Sunstein (2009) has addressed similar effects through his idea of the "Daily We," in which we seek out information which fits with our existing views, leading to "ideological echo chambers" (Pew Research Center 2014) and "information cocoons" (Sunstein 2009: 44), resulting a online environment that Pariser calls "a city of ghettos" (2012)—all largely without the user's awareness. For the most part, and in spite of the racial analogy of the "ghetto," this

discussion has mostly focused on the way that political opinions have become retrenched and insularized rather than the way that it creates insularity within groups subject to discrimination and creates blindness to those groups in "average," normatively privileged users.

Trackers on webpages follow our IP addresses and create profiles which are used by advertising firms in real-time bidding to determine which ads are served to us. To see the action of these trackers, go to Amazon and search for something you're not interested in—sump pumps, homeopathic remedies, or blouses, perhaps—and watch how related ads follow you around the internet in the next few days. These ad buys are informed not only by browsing history, but by other data obtainable through your IP address: for example, your zip code, and the median house price and voting record for your zip code. The background to what we search for and read becomes tailored to not only the online environment we create but to the offline environment as well. These have racial and gendered aspects, of course, creating an invisible online ghettoization of women and minorities and an invisibly white and male internet for white male users.

Google search results are similarly customized using IP address and browsing history—with search history as well, if the user is signed in and allows Google to do so. The purpose of this customization of results is to deliver the information which the user will find most relevant to her interests, but this clearly threatens to create racialized and gendered distortions, strongly compounded by the trust which users place in Google to provide relevant and objective information.

The extent and impact of the customized internet is difficult to study due to the complexity of these information ecosystems and their unavailability to public view, but it is clear that the impact can be significant. One study found that users identified algorithmically as female received "fewer instances of an ad related to high paying jobs" (Datta et al. 2015); another found "statistically significant discrimination in ad delivery based on searches of 2184 racially associated personal names," where searches for statistically black names such as DeShawn rather than statistically white names such as Geoffrey resulted in a greater proportion of ads suggesting criminal arrest records (Sweeney 2013). An invisible return of redlining also seems to be implied by this process, where those living in minority-majority zip codes may have an online environment that emphasizes e.g. payday loan services over mortgage services and educational opportunities. A patent acquired by Facebook even allows for assessment of a loan applicant through the Facebook Graph API:

> When an individual applies for a loan, the lender examines the credit ratings of members of the individual's social network who are connected to the individual through authorized nodes. If the average credit rating of these members is at least a minimum credit score, the lender continues to process the loan application. Otherwise, the loan application is rejected. (Lunt 2014)

It is not hard to imagine how this and other applications of social networking site APIs could have discriminatory results, given that online associations tend to emphasize in-group connections by race, sexual orientation, transgender status, and so on. Further, as the Internet of Things continues to expand, identity markers of increasing variety and specificity will be available to these algorithms.

What should be done?

We are all subject to various microaggressions at the hands of our tools—nearly every artifact designed to interface with persons must make significant assumptions about that persons attributes in order to withdraw into their experience. These only rise to the level of discrimination when they are persistent and significant in effect, or when they play into and reinforce existing discriminatory structures or attitudes. While One is not 6'4", microaggressions to someone of that height amount to little aside from bumping into the occasional beam or chandelier, and having to crouch down or lean over to wash one's hair in the shower. Left-handedness makes many things more difficult and uncomfortable, and accommodating artifacts, like left-handed scissors and guitars, are manufactured in order to address these difficulties. The persistence of these microaggressions and the seriousness of the difficulties they present is, however, incomparably greater in the case of someone who moves around on wheels rather than legs, and these microaggressions would produce a discriminatory effect even in the absence of ableist prejudice.

In most cases, we can't design to be responsive to every person, body, identity, and circumstance, and most of the time designing mostly for most people is good enough. It is clear that adhesive bandages available in only a single version of a "flesh" color is insufficient, and that ten different shades is probably more than necessary to avoid the negative discriminatory effect, but it's difficult to say how or even whether this should be applied to kitchen countertop design. What counts as a reasonable accommodation also likely depends strongly on individual applications, what's at stake, and what cost and effort accommodations will demand. A strong effort has been made to accommodate persons in wheelchairs in architecture, for example, and diaper changing tables—a cheap solution to a smaller problem—are increasingly common in men's bathrooms. Making virtual reality systems equally accessible to women is not currently recognized as so incumbent upon developers and companies, and insofar as such systems are used only for entertainment, it may well be sufficient for companies to say "we design for our target market," and to treat the exclusion of many women as a marketing choice rather than an issue of equity. When we look at the use of virtual reality in military treatment of post-traumatic stress disorder, however, it is more clear that providing unequal medical treatment to female veterans is a serious inequity, resulting in significant discrimination. We can imagine, similarly, that as customized pharmaceuticals and personalized medicine continues, the current research and development funding bias towards the diseases of the wealthy will result in increasing health care disadvantages for the poor—and, if such new forms of medicine attach to genetic differences across race or gender, other forms of health care discrimination may result as well. A further emerging set of issues is presented by a move to decentralized service provision under the "sharing economy": services such as Uber and Airbnb do not well-support persons with disabilities, with some reports of service animals being placed in trunks and blind persons being injured by drivers refusing them service (Heideman 2014), and business models which put provision of architectures of accommodation upon independent contractors are not well organized to ensure that all customers have equitable access.

In background relations, however, the problem isn't so much a lack of responsivity as it is an excess of "accommodation" in the form of targeting and customization. In either kind of case, though, the problem results from the Latourian delegation where the technical system enforces a cultural norm in an inflexible way through a causal system.

So, no general policy can be recommended except that designers and programmers be aware of how these disparities arise, and design in a way which minimizes them as appropriate to the particular tool and task at hand. What is needed is a process of diversity impact assessment, akin to environmental impact assessments already regularly conducted in some areas of technological design and implementation. Having greater diversity in technology and engineering fields would help, of course—and would be desirable for its own sake—but this is not something that should be beyond the abilities of straight white able-bodied Christian cis men! A good number of these issues can be addressed by stepping back periodically and asking how design choices will differentially impact people and communities different from one's own.

A good number of other problems, however—such as personalized information spaces, social organization through calendars, and established gender roles—are so diffuse and multiply-grounded in social norms and technical systems that they may be nearly insoluable. It is an existential rather than a technical problem that the One which forms the averageness with relation to which we live is something from which *all* of us deviate and are excluded from in one way or another.

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