




Algorithmic Necropolitics

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Introduction

The High Commissioner for Human Rights notes that, concerning the human right to the highest standard of physical and mental health, systematic racism is not limited to the assertion of individual hatred¹, but manifests itself in governmental systems and public policy institutions which fortify barriers to equality (OHCHR 2021).

This text intends to highlight the impact of algorithmic processes on human rights, particularly in the space of migration and mobility. Using Achille Mbembe's notion of necropolitics, the text argues that the way algorithms are employed in migration practices infringes on the human right to freedom and dignity. Suhail Malik and Armen Ananasseri use terms like pre-emptive strike and pre-emptive personality to illustrate their theory that in the contemporary moment of complex societies, the future happens before the present. They introduce the speculative time complex as a response to the pre-emptive nature of algorithms, surveillance, and governance (2016:10-22). Indian anthropologist Payal Arora examines the politics of big data from the perspective of the third world. She makes a direct link between the use of biometric identification systems and the restriction of migrants in the global south. Her arguments about global tech narratives demonstrate how the so-called third world is expected to merely follow the West's lead in their implementation of digital technologies (2019:38-44).

1 Office of the United Nations High Commissioner for Human Rights (OHCHR 2021), "Seminal United Nations report offers an agenda to dismantle systemic racism", 29 June 2021.



The broad suggestion is that the way algorithms are designed is highly political. More specifically, border politics, economic rhetoric, data management, and surveillance are used to restrict the movement of African people, simultaneously affording Western nationals every freedom under a façade of benevolence. This reveals the political nature of the relationship between human populations and technological objects. This text examines algorithmic projects such as big data and biometric identity systems as part of a broader political history in the postcolonial era. In efforts to control non-Western mobile populations, biometric borders extend their influence on the identity and autonomy of vulnerable human beings.

Algorithms are Political

Algorithms are sets of instructions. Essentially, they are lists that rank information, and their complexity comes from peak finding. The purpose of the mathematical, computational processes of algorithms is to find efficient solutions for problems with large inputs. However, the common assertion that algorithms have no editorial viewpoint is not only false, but dangerous. Every list has an objective and thus a set of priorities. Even when it ranks people alphabetically, there is no surety that an algorithm will have an equal impact on people with varying backgrounds and identities. There is, strictly speaking, no such thing as a neutral algorithm. As their job is to make value judgements about the order and hierarchy of things, algorithms are biased by definition. Whatever their basis for deciding that some things are more valuable or more noteworthy than others, it is founded on the discretionary aspects of human politics. After all, it is human beings who instruct these algorithms.

According to the American author Eli Pariser who coined the term “filter bubbles”, algorithms present challenges to democracy. Filter bubbles are personal clusters of information generated by algorithms, based on predictions of what people are interested in (2018). In the era of algorithmically selected media, the aspect of decision-making is no longer in the

user's control. Reality is predetermined based on algorithmic processes. As the filter bubble landscape is seemingly automatic, users have no way of knowing how these decisions are made, nor do they have much hope of exploring the information that is out of view.

In this moment that Achille Mbembe describes as “accelerated times”, algorithms are more impactful than ever (2018)². The rate of change and the size of data sets is increasing. Computers are continuously improving their capacity to deal with large inputs, yet the larger the input, the more concerned we ought to be with how efficiently they deal with these information sets. Because of the vast impact of algorithmic decisions, we have the prerogative to be critical of their supposed unbiased nature. Mathematics may be their structure, but algorithms are a human system. Their success is predicated on the general public endorsing their use. The algorithm is the platform upon which human tendencies are expressed. Communal engagement enforces them, making algorithms more political than mathematical (Breitman 2017).

Necropolitics

I began writing this text while travelling through Sweden and becoming reacquainted with the reality of being treated like a lower-class citizen. Even as a somewhat privileged academic accustomed to travelling the world, my recent experience in Sweden was chilling and soul-destroying. This experience inspired me to reflect on what Johannesburg-based Cameroonian philosopher Achille Mbembe refers to as “deathworlds”. In Mbembe's conception, deathworlds are spaces where global superpowers and institutions justify the reduction of people to the status of bare life. Mbembe's reflections were based on Michel Foucault's introduction of the notion of biopower in his 1976 book, *The History of Sexuality*. In it, Foucault described biopower as a tool of power used by modern nation-states to control large populations.

2 See also: <https://www.uni-augsburg.de/de/forschung/einrichtungen/institute/jfz/>

This mechanism that can be deployed against people cannot be exerted by individuals. Rather, it requires a social system with a long and homogenous history (Agamben 1997:37–55, 75–100, 125–48, 213–44).

To illustrate his concept, Foucault describes a historical moment when royalty held control over the state. This instrument of power, which he called the sovereign, held the right of the sword and the ability to condemn people to death. They determined who lived and who died. This was the time of executions in the town square and sending armies to kill large groups of people. For centuries, this was the standard practice of governance. According to Foucault, biopower emerged around the 17th and 18th centuries, transforming the logic of control and power. Foucault identified this new form of social and political control as exerted on populations by modern forms of government. The power shift was redistributed between what he called sovereign power, disciplinary power, and biopower.

Instead of a right to execute, biopower exhibits the unique power of modern governments. The right of the sword was concealed and the new regime was not about the power to put people to death, but about how the system could control life. Biopower led to decreases in mortality rates, increases in life expectancy, and improvements in the general standard of life, allowing this new form of power to operate in a way that it appeared benevolent, assuming perfect control over populations. This form of power takes control of reproductive rights, determining laws and logics related to race and racism, dominating institutions such as schools and hospitals, and purporting to administer life through medicine, information, and bureaucracy. The appearance of benevolence is key to biopower though Foucault exposes this as a façade. He dismisses the assertion that these institutions are marvels of scientific rigour and development. In Foucault's view, biopower operates by splitting populations into those who must live and those who must die. It seems preoccupied with the distribution of the human species into groups, revealing

the inherent racism of biopower. Foucault proposes the term “racism” to refer to this technique of categorisation.

In his 2003 essay titled *Necropolitics*, Mbembe expands on Foucault’s ideas. Mbembe suggests that biopower is only part of the picture. His essay was an attempt to respond to and explore what Foucault’s biopolitics left out (2003:12). Even in a nation of democracy, under new forms of social existence, weapons and technologies are deployed to maximally destroy individuals and populations. Mbembe traces this violence back to the legacies of slavery and colonialism that bolstered Western societies. The African philosopher proposed a way to account for the many examples of where the right to kill is being exercised today. For this proposal, he introduces the term necropolitics or necropower. Necropower exerts itself differently than sovereign power as Foucault described it, in that it entails the subjugation of life to the power of death. Mbembe traces the exertion of this kind of power to the roots of modernity.

By beginning his essay with deliberations on the nature of sovereignty, Mbembe asserts that

the necropolitical is based on the sovereign’s right to kill. He cites “the right of the sword” as its origin. In modern times, the right to kill need not necessarily manifest itself in the form of a sword, gas chamber, or drone. Technological advancements have ushered in a new form of seemingly invisible power. Mbembe turns to Agamben’s concept of the state of exception, a temporary circumvention of human rights and a suspension of laws that allow the powers that be to enact stringent judgments and exert excessive control over people. According to Agamben, this exertion of control reduced bodies to what he called “bare life”. Populations who are reduced to bare life are robbed of dignity and purpose, and made expendable (1997:23–80).

In this sense, necropower doesn’t require physical death, but a state of living death. By stripping people of their dignity, and reducing them to flesh and bone, particularly black

and indigenous people are used as tools for the benefit of those in power. Modern incarnations of sovereignty create deathworlds, in which vast populations are subjected to conditions that reduce them to the status of the living dead. While the sovereign's power is in the right to kill, it can only control that which is living. Therefore, death had to be regarded as the ultimate punishment. Modern biopolitical governments had to subjugate populations to the fear of death, which Mbembe cites as "the power of death". (Mbembe 2013:7)

If death were not feared but embraced or endorsed as it had been in many precolonial cultures, the justifications for control would be ineffective. Contemporary forms of government require populations to despise death as it is beyond the reach of power. Even in war where government wields the right of the sword, death intentionally remains taboo. Warfare is waged in the guise of the preservation of life. Bombs, guns, and drones are deployed with a level of apathy, supposedly for the safety and freedom of citizens. For Mbembe, necropolitics exerts itself with statistical perfection. It deploys tactics and strategies that destroy certain populations with minimal resistance. Through mechanisation, the destruction of individuals and populations could be turned into a purely technical procedure. Supported by class-based racism, the implementation of power became remote, impersonal, and anonymous (2003:18).

Sweden and the Power of Benevolence

One would be forgiven for assuming that while these concepts are insightful, they have no place in the apparent utopia that is Sweden. Indeed, during my three-month stay, I observed that the Swedes themselves are convinced of their perceived benevolence. While they own up to being a cold people, they will not stand to be held accountable for any involvement in the violent and racist legacies of other Western nations, often asserting that they had no involvement in colonialism, slavery, or the World Wars.

Indeed, the dominant narrative is that the Nordic region in Europe, which consists of Denmark, Norway, Finland, Iceland, and Sweden, is progressive and ideal. Sweden is seen as a place where quality and freedom are valued. The welfare state has low unemployment and liberal asylum systems. Swedes consider themselves a country of technological pioneers. The Nordic nation boasts being the world's first cashless society with an economy driven by digital innovation and Stockholm being a European technological epicentre. Thousands of Swedes have already adapted their bodies through the insertion of microchips under their skin. The quick, simple procedures where electronic chips are implanted into people's hands are often done at microchipping parties held across the country. The chips use near-field technology much like contactless cards and can be read using a device such as a smartphone. These chips can store information such as contact details, business cards, and health data like blood groups. They can also be used as house keys, train tickets, or bank cards³. National rail companies have embraced microchips with thousands of customers using their chips instead of tickets. Companies have encouraged thousands of workers to use microchips as a means of gaining access to their workplaces. For Swedes, this is a matter of convenience and practicality.

Generally, Swedish people exhibit no concerns about blurring the line between human and machine. On the contrary, bio-hacking entrepreneurs such as Hannes Sjoblad are dedicated to improving human bodies through technology. For Sjoblad, microchips are just the tip of the iceberg. According to Swedes, those who have not yet embraced this new technology are simply behind the times but will one day be chipped just like them⁴. The main concern for critics has been the issue of data protection. As microchips become more common, the access, amount, and kind of information stored on them will become more complex, increasing security risks. This becomes an ethical issue, conjuring questions

3 See *Why human microchipping is so popular in Sweden*, 2019.

4 See *Why human microchipping is so popular in Sweden*, 2019.

of consent: questions about who has access to the data stored in microchips and how they could use it. Who's to say whether all the information on microchips may be captured or stored involuntarily? Or whether there will be efficient mechanisms in place to prevent state and corporate entities from having access to people's behaviour and whereabouts?

While it may be a leader in the implementation of such technologies, in this regard Sweden has been exposed for failing to ensure that they are respectful of human rights. Swedish intelligence and legislators were condemned by the European Court of Human Rights for their largely illegal surveillance laws. Five judges out of the twelve-member chamber criticised the lack of regulation and observed violations of the European Convention on Human Rights in Sweden's surveillance practices. They recommended that mechanisms be implemented to control abuse and that the technology of regulators be adapted to efficiently respond to new technologies⁵. This judgment is at odds with Sweden's self-proclaimed status as a utopia of sorts. Its blatant disregard for the ethical dangers of its role as a technological pioneer points to an essential aspect of how Sweden uses technology. There is a clear difference between the public perception of what the technologies are for – convenience and practicality; and what they end up being used for – surveillance and the contravention of human rights.

This is especially concerning from the perspective of migrants. There has been a high influx of immigrants from war-torn countries like the former Yugoslavia, Somalia, Syria, Iraq, and Afghanistan into Nordic countries over the past two decades. Sweden, a country of only 10 million people, has seen the highest number of refugees per capita in Europe (Ahlander 2015). A report by Nodregio, a research entity of Eurostat, the statistical office of the European Union, states that from 1990 to 2016, the population of Nordic countries grew by 15%. Immigration accounts for roughly two-thirds of this increase

5 See *Surveillance laws_ ECHR condemns Sweden and Great Britain*, 2021.

(Heleniak 2016). As a result, an increasing number of Swedes have become outspoken about their rejection of the country's supposed generosity, prompting many migrants to be asked to leave. In 2016, Sweden joined other European countries in reaching agreements for voluntary and forced repatriations of thousands of asylum seekers (Crouch 2016). In announcing that up to 80 000 immigrants would be deported back to dangerous, war-torn countries, the Swedish government made a declaration of its right to kill.

More recently, in April 2022, Swedish cities such as Stockholm, Malmö, Örebro, Norrköping, and Linköping witnessed violent uprisings after anti-Muslim demonstrations were planned by far-right politician Rasmus Paludan who holds Swedish citizenship (Ringstrom 2022). According to reports, Paludan and his far-right political group Stram Kurs posted a video in which they burned the Quran and threatened to repeat the action at the scheduled anti-Muslim parade. Counter-protestors disrupted the anti-Muslim rallies, but the Swedish police came to Paludan's defence in the name of freedom of speech. This led to violent clashes between the police and the counter-protestors. Police officers were stoned, busses and other vehicles were set alight, and dozens were arrested (Westfall 2022). This vision of Sweden may be disturbing to some, but it is nothing new. Sweden has witnessed a general rise in violent unrest and particularly violence related to immigration policies several times in recent years. In 2013, Sweden's capital Stockholm witnessed five-day riots during which schools, a library, a bank, and a police station were attacked (Evans 2013). Paludan's abominable actions may have been provocative, but they are a mere symptom of Sweden's larger societal imbalances. Instead of being considered anomalies, these events should inspire national debate about immigration and social inequality in Sweden.

Borders as Deathspaces

Deathspaces refer to physical locations and zones where the sovereign power exercises control over life and death, often

manifesting through the subjugation and exploitation of certain groups of people. Mbembe's analysis of deathspaces is particularly relevant in understanding the dynamics of contemporary global politics, where borders, detention centres, and zones of conflict become spaces of death where certain lives are rendered expendable (Mbembe 2003).

Governments and border authorities increasingly rely on advanced surveillance systems, biometric identification methods, and big data analytics to monitor and control movement across borders (Kumar, 2019). Such technologies have enabled states to collect vast amounts of information about migrants, which influence decision-making processes regarding entry, residency, and deportation. Moreover, the rise of digital technologies has also resulted in the creation of virtual borders. While physical borders remain significant, the digital realm plays an equally crucial role in regulating migration flows. Online platforms, social media, and digital communication have become spaces where migration decisions are made, information is exchanged, and networks are formed (Madianou & Miller, 2012). Additionally, the use of digital technologies has given rise to new forms of border control and securitisation. For instance, the development of e-borders and virtual checkpoints has allowed states to extend their surveillance and enforcement capabilities beyond traditional border points (Amoore, 2006).

As a self-proclaimed technological pioneer, with ambitions to rid itself of its unwanted populations, Sweden is the ideal example of how necropower is being exerted through technology in the contemporary context. Today, technology has taken over the space of borders. Migrants find themselves perpetually at the mercy of digital technologies which influence migration policies and the very nature of borders. The ecosystem in which these technologies are deployed is imbued with increasingly anti-migrant policies. The criminalisation of migration is rooted in systemic racism which makes border regimes inherently violent. This violence is evidenced by the countless gravesites scattered along border sites. While many are more prepared to accept the notion of

the violence of border sites in places such as Israel, few are willing to accept that even border sites in Europe are violent (Molnar 2022).

Border sites are largely unregulated. These deathspaces are often zones for technological experimentation, which proliferates without governance or oversight. Invasive surveillance technologies such as cameras, thermal detection, and drones are openly employed throughout border sites under the façade of smart border technology. Digital technologies are a core component of migration management, often used to track irregular migrants. Biometric identification and algorithmic systems used in various areas of the migration process are justified by the argument of efficiency and convenience. Once again, the downsides are rooted in the absence of regulation and governance. As these technologies are applied to existing migration laws, simply in terms of technical policy, there are countless, heedless infringements on the privacy and rights of migrants. This lack of technological regulation makes this a geopolitical issue.

The European Union plans on introducing a new EU ID wallet-based system in 2023. The infrastructure behind this new system is based on data minimisation principles, which would improve cross-border mobility for European citizens. Once again, the question is how European countries' employment of these digital ID systems will affect migrants, third-country nationals, and asylum seekers. Based on the current state of things, at best these digital ID systems will increase surveillance. Governments who use biometric identification, drones, and mobile device hacking, can and do use these to harass immigrants, activists, and journalists working on this subject matter (Bither 2022).

Through the unregulated technological experimentation of border spaces, populations are subjugated to the state of bare life. These systems do not acknowledge their targets as real people, but simply as inputs and outputs. Computational tools founded on European political ideology and structure produce abstractions of the lives of migrants, refugees,

and third-country nationals on which they exercise their sovereign power.

Reclaiming Tech Narratives

Achille Mbembe focussed his 2018 professorship at The University of Augsburg on these ideas. His presentation “Borders in the Age of Networks” examined issues of mobility, access, and the basis on which people are excluded from certain spaces. Mbembe dubbed this a “time of planetary entanglement, and technological escalation”, noting how various elements of social life had become increasingly dominated by digital technologies whose ultimate aim seems to be enclosure.⁶

Mbembe referred here to Heidegger’s concepts of the “double essence” of technology. On the one hand, Heidegger conceived of technology as instrumental. In this anthropological sense, technology is a means to an end, which distinguished humans from other species. On the other hand, Heidegger saw technology as “a way of thinking”, or a mode through which “un-concealment takes place”. According to Mbembe, in invoking terms such as “the essence of technology”, Heidegger

allows us to question how we inhabit it. What Mbembe finds particularly interesting is Heidegger’s assimilation of freedom with what he calls “the open”, which is a space where we are neither restricted by nor pitted against technology.⁷

In terms of the dynamic between humans and technical artifacts, Heidegger’s approach to technology is embedded in a long tradition in the West from which he seeks no departure. From the outset, Western metaphysics makes the assumption that there is a division between the technological world of

6 Mbembe presented this seminar hosted by the Institute for Critical Social Inquiry & The New School for Social Research at the Tishman Auditorium New York, NY.

7 All quotes in this paragraph are drawn from the seminar referenced in the footnote above.

humans and the natural world, ignoring the fact that the use of tools among animals is clear and common. Therefore, Western conceptions of technology are predicated on the myth that the technosphere is exclusive to a particular kind of human with sizeable cognitive capabilities. These misconceptions suggest that the development of culture and language separates this kind of human from a purely instinctive connection to the realm of nature. Mbembe cites Lévy-Bruhl's notion of the primitive mind as this tradition's approach to original humans who supposedly lived under the command of animism⁸.

Western thought implies that technological artifacts and devices serve either to replace human function or to fulfil human need, but it clearly harbours complex anxieties around the relationship between things and people. While it strives to assert people's command of objects, it stresses that humans are not objects. This emphasis points to an underlying concern that someday technological objects may come to usurp their inventors, thus inverting the dynamic and rewriting the tech narrative. In spite of this anxiety, nations across the globe operate under the Western-sanctioned imperative that progress should be the ultimate goal. The necessitation of constant progress promotes a tunnel vision focus on the positive impact of technological advances. These contradictory concepts can be traced back to the Enlightenment. This was an era of scientific discovery and the democratisation of knowledge. From then on, society experienced technological progress at ever increasing speeds (Hoffmann 1966).

This culture of perpetual progress was also rooted in colonial exploits of the time and resulted in new economic realities and new forms of government which subjugated black and indigenous people. The core issue of building these technologies around the ideology of constant progress is that it is driven by the Western economic system. Because of its

8 Lévy-Bruhl's primary field of interest was primitive mentality. According to him, instead of distinguishing between the supernatural and reality, the primitive mind uses "mystical participation" to influence the world (Lévy-Bruhl 1924).

roots in slavery and colonialism, it is difficult to define ethical forms of progress in this context (Piketty 2022).

Even when contemporary internet users point out its problematic aspects, they often use indigenous people as their anti-tech justification. This is problematic because it reveals, once again, the belief that there is an inherent divide between blackness and technology. Though the perpetrators of this argument declare themselves as defenders of the purity of indigenous cultures, the result is a fetishist alienation of these cultures from tech narratives (Rice 2016). In this postcolonial moment, there can be little argument against the concept that all people have the right to access basic services like running water, medical care, and freedom of movement. These rights must, however, include the right to efficient access to modern technologies.

Conclusion

While this text has taken a critical view of the contemporary uses of algorithmic processes, it is by no means an assertion that technology is inherently wicked. Technological advances have enabled people to live longer, healthier lives. They have connected communities, internationalised social movements, and facilitated more ethical labour practices. Instead, this text calls for more considered approaches to the implementation of these technologies, bearing in mind their historical and political context.

Mobile bodies are subjected to the constant threat of death through surveillance, blacklisting, or exclusion for the purpose of restricting the majority of non-Western populations to the bounds and rules determined by Western society. However, the persistent rates of poverty, brutality, incarceration, war, and death demonstrate that obedience and conformity do not equate to inclusion within the Western system. Instead, subservience leads to further exertions of necropower. Even when they are employed by entities who mean well, the unintended consequences of digital technologies can be dire. Among many things, the dangers of

biometric and personal data collection include the threat of data breaches. For instance, in January 2022, the Red Cross was hacked, resulting in the theft of the private information of roughly 515 000 vulnerable beneficiaries⁹.

Because they are designed by state and corporate entities, predictive algorithms approach bodies with a particular vision of what the future ought to be. These algorithmically generated futures are devoid of the political and ethical complexities that might and do exist in reality. The linear data collected and surveyed by algorithms on which decisions about the fates of populations are based is not representative of the wholeness of being.

The power to dictate life has been outsourced to algorithms and other forms of artificial intelligence. Sovereignty has increasingly been privatised and made available to those who can afford it. Territorial borders are encompassed in modern techniques for the regulation of belonging, denial, or access to space. Therefore, the defence of human rights has come to be rooted in the space of digital technologies.

The newness of emerging technologies does not negate past narratives of Latin American, Asian, or African societies needing to “catch up” to the developed West. Instead, approaching algorithms as politicised infrastructures invites us to explore their built and constructed nature, encouraging subjugated peoples to develop new trajectories for digital media aimed at benefitting non-Western societies (Sandvig 2013:13-17).

In the framework of Western logic, the movement of African subjects is restricted and the very fabric of African subjecthood is denied. The Western conception of technological narratives restricts the freedom and dignity of African subjects within the technological realm. Global digital cultures are structured by uneven power relations and big data has a substantial impact on citizenship in the Global South.

9 See Cyber-attack on ICRC: What we know, 2022.

Therefore, existing algorithmic frameworks cannot be applied ethically in the context of non-Western communities.

As philosophers such as Achille Mbembe have taught us, though these systems appear immovable, discourses around data technology are not merely about technological objects, but about power. Mbembe implores us to consider which entities can decide what is innovated on, why, and by whom. As power consistently makes it clear that it will not cede itself, it is up to those who are subjugated to make new inroads. As the digital divide closes and more people begin to learn coding through software programs such as Python, tweaking algorithmic processes has become more plausible.

A key aspect in which technology is superior to biology is through the process of ageing. Though technology tends to accumulate error over time, where biology eliminates error through death and extinction, software offers more opportunity for improvement¹⁰. If certain software has a bug or a glitch, it is not discarded, but fixed. Classic data structures and algorithmic systems were invented decades ago, and currently require improvement based on ethical inclusion.

In these accelerated times, it is the imperative of non-Western coders to design for the messy, contradictory, and complex conditions the future will surely present. As opposed to the mirage of perfect technology, which is designed to be consumed by flawless consumers presented by Western tech narratives, non-Western programmers have the advantage of designing from the margins. From this vantage point, programmers can grapple with problematic technical policies, likely futures in which technology remains inaccessible, faulty, or destructive. This methodology offers opportunities for inclusion and debate, not only about what the future could be but about what it should be.

Engineers, scientists, artists, and policymakers should be tirelessly engaged in the ethics around the creation of the

10 Aging of Biology and Technology from Complex Time: A SFI/JSMF Research Theme; See also: <https://santafe.edu>.

future. They can seize the opportunity to use data to create meaning rather than profit. African coders, in particular, will be supremely cognisant of the immense impact they will make on people's lives when developing and designing these tools. When coding for Africa, new objectives and directions that may not have been otherwise considered will arise. Coders on the margins will be better equipped to consider the human element. Through an awareness of their political nature, they will resist seeing algorithms purely as technological objects, and instead, approach them as enablers of social structure. Only then can algorithmic potential be harnessed to its fullest degree.

In conclusion, this paper has asserted that algorithms are a human rights issue. The way data is harnessed is an essential aspect of treating people with respect and dignity, particularly in the context of continued systemic violence. Big data should be used in a humanist manner, otherwise it results in the production of violence, harm, and distress. It rests on subjugated populations to develop technologies that benefit people equally and ethically; to deliver safe programming on their own behalf.

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