

Quadrupedal Robots as Extensions of Canine Racial Violence

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Abstract

The purpose of this paper is to explore the social and political implications of emerging quadrupedal robot models designed for use by the military and police in connection to the historical use of biological police dogs as tools of state sanctioned racial oppression. The intent is not to reinforce conceptual parallels between biological dogs and technology which merely imitates the quadrupedal motility found in the canine form, but to critically analyse the rampant zoomorphism found in rhetorical efforts which seek to induce both fear and empathy in the public's perception of autonomous robots engineered to extend neoliberal state power. This paper aims to undress the conflation of biological dogs with biomimetic autonomous robots in the context of the bio/techno epistemic procedures used to condition these inhuman agents to perpetuate discriminatory racist practices among others. I argue that the endeavour to assimilate quadrupedal robots into police forces through their perceptual alignment with biological K9 units positions them in a historical continuum of racist state violence that they cannot be dissociated from. I will delineate the converging ideological and material circumstances encompassing the neoliberal motivation to develop quadrupedal robots in addition to training biological canines to be instruments of state oppression.

Keywords

Quadrupedal robotics, Canines, Racism, Violence, Colonialism, Neoliberalism, Surveillance, Policing, Algorithmic bias

Introduction

The use of canines to perpetuate racial violence and fortify the domination of the white supremacist social order imposed onto racialized peoples dates to the Spanish colonization of the Americas, the French colonization of Haiti, the tactics of slave owners in the United States, the nazi holocaust in Europe, and crowd control during the United States civil rights movement. [1] The image of the German shepherd as a symbol of state sanctioned racial violence being evoked by protestors resisting the police murder of Michael Brown during the Ferguson riots in the U.S. in 2014 shows that such barbaric practices are still ubiquitous with white supremacy in the present day. [2] The training methods historically used explicitly to condition dogs to attack racialized peoples and the disproportionate amount of harm perpetrated by police K9 units against black and brown people has led some to ask the question; can dogs become racist? [3] Bearing this question in mind, at the surface, this paper seeks to compare the abusive nature of these training methods to the phenomenon of "robot abuse" found in video footage attempting to show off the

stability and reflexes that have been programmed into quadrupedal robots. On a deeper level, this comparison will utilize the points of contrast and continuity between the ways discriminatory racial dynamics manifest in the behavioural cognition of the biological dog and its machine counterpart to offer a novel perspective on the processes through which inhuman agents become catalysts of racist oppression.

This paper will begin by examining the methods used historically by white supremacists to foster animosity and aggression into their dogs' association with racialized people. Additionally, criticism will be directed towards the sociocultural semiotics employed to promote mass acceptance of K9 police and military units while conserving the presence of the canine as a sign of intimidation which requests submission to authority and the prevailing social order. This examination will lay a framework for interpreting contemporary representations of quadrupedal robots in the media and understanding their current and future utilities developed for police and military units. Analysis of the training tactics designed for application in animal behaviour and psychology will lend use to unveiling the fallacies found in equating robotic functions and machine learning capabilities to biological cognition and embodied sensory perception. However, in revealing congruences in the logic underlying the bio/techno epistemic processes through which each of these inhuman agents become proponents of racist socio-political regimes, this analysis will further expose the fraudulence of neoliberal state power which rests upon the relentless maintenance of white supremacy. Furthermore, focus on the bio/techno epistemic processes through which racial biases are taught to these inhuman agents will highlight the intrinsic artificiality of white supremacist ideology as a fabrication constructed in the service of neoliberalism rather than being an objective reality.

Historical Background of Racialized Canine Training Methods

In a paper titled "You Should Give Them Blacks to Eat": Waging Inter-American Wars of Torture and Terror by Sara E. Johnson (2009), Johnson delineates the role of domesticated hound dogs used to murder, harass and instil fear in the peoples of Haiti during French colonization and the Haitian Revolution. Johnson describes how dogs owned by French aristocrats were starved and then paraded around town before being made to devour enslaved black Haitians bound in chains on platforms in town square; such spectacles of extreme

human violence and cruelty were common occurrences. She states that the psychological intent here was crucial, as beyond being used to hunt down black rebels, dogs were employed to publicly consume them in a staged performance of white domination and supremacy. An account left by French colonist Marcus Rainsford describes the training process which primed these dogs for such behaviour to involve confining the dogs in small cages while starving and harassing them to promote intense aggression. The colonial chasseurs would fashion black human forms out of wicker and fill them with the blood and entrails of other animals, these objects would then be placed in the direct sight of the dogs, just out of their reach. After weeks of starving and beating the dogs, they would be released to gorge on the dummy filled with raw meat and organs while being praised and encouraged by their trainers. Prior to a staged killing, the dogs would be routinely agitated and starved to heighten the ferocity with which they mauled their chained victims. [4]

Similar training techniques are found in those employed by slave catchers in the antebellum south. However, here we find that slaves were forced by the dog trainers to beat the dogs themselves, being made to whip and verbally harass the dogs daily starting from puppyhood. Following this regiment of abuse, the slaves would be forced to run away and hide in the trees to train the dogs to track their scent in a hostile pursuit. The dogs would be encouraged to bite and attack the slaves once located to further draw out the fear-based aggression towards racialized peoples that was coercively and methodically instilled into them. [5] In both instances, we see social constructions of race forged at the beginnings of white supremacist empire attempt to be fostered into the behavioural psychology of the dog through abusive tactics. It was the aim of the white colonists and slave owners to artificially supplant their fabrication of black men as the ultimate enemy into their dogs' psyche to render the dogs' bodies into a technology used to enforce the colonial order of racism and capital accumulation which was sustained through terror and violence. Black slaves, who were made out to be rabid savages in the white imaginary, were assuredly threatened by slave catchers into embodying a performed demeanour of brutality in order to compel the dogs to associate severe pain and danger with black men. These practices worked dualistically on a sociocultural level to reinforce the bio essentialist notions of race expounded by white supremacist ideology as being based upon innate and unchangeable biological characteristics which were inscribed in the natural order of the organic world. Ideas circulated of the dogs being born and bred with an instinctive hatred of black men served to racialize the animals' sensory perception and naturalize conceptions of racial differences being observable across species through scent, sight and sound.

Though contemporary methods for training police dogs cannot be said to contain the same racially charged methods as their colonial predecessors, elements of abuse remain inherent to coaching police dogs to attack

on command. Nevertheless, the history of the iconographic German Shepherds which have come to populate police K9 units is still loaded with white supremacist baggage which can be traced back to their use by nazi soldiers during the holocaust. Trained and deployed to police Jews and guard nazi property, German shepherds became a symbol of state terror during World War II due to their prolific usage by the nazi regime. Amid the civil rights movement, Vicksburg police even boasted the use of two shepherds trained by a "former nazi storm trooper who trained killer Dobermans to guard Hitler's airports" to attack student protestors engaged in acts of peaceful resistance. Police dog training manuals of the time impressed upon handlers the need to agitate, tease, and harass their dogs as preliminary measures to stimulate the aggression necessary to command the dogs to attack human decoys wearing padded suits and ultimately, criminal suspects. Although contemporary police dogs are not explicitly trained to 'see race' through methods of negative reinforcement that promote hostility towards racialized people, the systemic processes of segregation and spatial stratification that determine where the K9 units are actively deployed and who they will target enables this cognitive association to be built over the course of their police service. [2] Research in canine behavioural psychology demonstrates that canines are acutely aware of the unconscious and conscious psychological states of their handlers and will internalize subtle cues of fear and anxiety in their handler's internal physiological response to stress that would go undetected by human perception. [6] Videographic and testimonial evidence documenting instances of police dogs impulsively lunging to attack unarmed people of colour, posing no threat to the officer and willingly complying to their demands attests to the racial bias picked up by the dogs through unconscious cues. Disturbingly ample archives of arrest footage shot from bystanders' cell phones depict defencelessly restrained people of colour screaming in pain as they are mauled by police dogs being praised "good boy" and given rewarding pats by their handlers. [7] Such footage reveals how the training methods used during colonization and plantation era slavery to pre-emptively instil racial bias in canines have evolved to occur while the animal is on active duty, interfacing with civilians in public scenarios external to their private training environments. Though this paper primarily speaks to the violence of K9 units operating in the U.S., the pervasiveness of the issue extends to other neoliberal states which were founded on the genocide of indigenous peoples and still operate according to the discriminatory practices of institutional racism. The conduct of Western Australia based police departments exemplify this claim, as their K9 units have come under fire in the past year for perpetrating excessive violence against indigenous youth, causing severe facial wounds on a 13-year-old boy in one such case. The department in question released a statement saying that the K9 responsible for the child's suffering will not be discharged from service but will

undergo a retraining process which will not be disclosed to the public. [8]

Media Representations

It is not insignificant that the onset of the nationwide adoption of K9 units by the United States police directly succeeded several of the most monumental moments of the civil rights movement taking place there. Following a successful media campaign spearheaded by the production of the “Rin Tin Tin” series franchise, the German shepherd’s patriotic Hollywood depiction lent amicably towards rhetoric which heralded the breed as a bastion of law and order in popular consciousness. [2] A familiar phrase of dystopian science fiction which is disturbingly echoed by both colonial and contemporary advocates for weaponizing dogs as a technology of state violence alike deems such animals to be “hounds of peace.” [4] Though the sentiment expressed here effectively translates to “hounds of maintaining the racist social order imposed by the white propertied classes,” this idiom and its accompanying rhetorical devices worked to garner mass public support for the widespread assimilation of K9 units into United States society during a critical turning point in the struggle for racial justice. Propaganda espousing the K9 unit as a necessary police tool which would prevent civil society from succumbing to the harms perpetrated by criminals and insurgents played upon well-established racist tropes which positioned blackness as a constant threat to the safety of white women and their families. The impressive agility and sensory capabilities of the dog which allow it to quickly traverse uneven terrain and overcome obstacles with ease were emphasized by claims that postured the canine as “able to go where the officer cannot” and brought further credence to the supposed indispensability of K9 units to effective policing practices. [2]

At present, there are three primary corporations which are producing quadrupedal robot models intended for use by and currently being licensed out to the police, military and other government agencies; Boston Dynamics “Spot,” Ghost Robotics “Vision 60,” and Asylon Robotics “DroneDog.” [9][10] The rhetoric surrounding media statements about the quadrupedal robot’s adoption by police units and military bases dub the machinic systems to be “man/soldier’s best friend” and “four-legged crime fighters,” while others declare that “Digi dog is out of the pound.” [11] [12] [13] This language attempts to rearticulate the material arrival of autonomous machines that have hitherto symbolized dystopian breaches of authoritarian state power in benign and endearing zoomorphic terminology. The four-legged form of the quadrupedal robot produces a gait with a visible likeness to the motility displayed by a range of quadrupedal mammals, making the canine label that has been unanimously ascribed to these robots appear as a relatively arbitrary anthropocentric contrivance reflecting social values to a greater extent than the presence of any other physical characteristics specific to biological dogs. The ubiquitous categorization of

quadrupedal robots as ‘robot dogs’ speaks to their intended purposes as automated laborers and the historical significance of working dogs in society, largely by the military and police but also as assistants to hunters, farmers and disabled persons. Efforts to aesthetically and phenomenologically categorize the quadrupedal robots with biological dogs draw on generations of cultural associations built around domesticated dogs as family pets and loyal protectors. Reports espoused by the neoliberal media recurrently rely on zoomorphism to dissociate quadrupedal robots from their dystopic connotations and facilitate their broader societal acceptance. However, what the media claims to be a dog is not an animal at all, but a weaponized surveillance system fashioned into an autonomous machine. Further rhetoric found in the media reverberates with the rationale which ushered in the assimilation of biological K9 police units into U.S. society, claiming that the advanced motility found in the quadrupedal form will allow the machines to traverse harsh terrain and enter dangerous scenarios which present challenges and potential harms to the human body and wheeled vehicles. The mechanical attributes which give quadrupedal robots a robust set of faculties for data intake and analysis while offering greater degrees of invulnerability to the elements are strategically invoked to demonstrate their superiority to the biological limitations encountered by humans and canines. In an argument made to support the supposed need for quadrupedal robots to be employed by U.S. border patrol, a member of the Department of Homeland Security states; “The southern border can be an inhospitable place for man and beast, and that is exactly why a machine may excel there.” [14]

Of the three aforementioned corporations, Boston Dynamics has garnered the most media attention through their proliferation of videos depicting squadrons of Spot robots performing choreographed dances with an exacting synchronicity. The Spot model has subsequently made high profile appearances on the runway at Paris fashion week and in the creative works of the art collective MSCHF and Agnieszka Pilat. [15] [16] [17] Contingent with the fame acquired by Spot in elite artistic milieus and gimmicky advertisements, videos of Spot and other robot models developed by Boston Dynamics enduring so-called “robot abuse” have become viral internet sensations. Footage depicting Spot being relentlessly knocked over and destabilized by the blows of its engineers have captivated viewers with a sense of gut-wrenching empathy that is rarely extended to the physical conditions of impersonal machines. Witnessing robotics engineers knock around their technological creations with a certain remorseless aggression has vexed the public with sorrow for the illusory plight of machines subjected to staged assaults intended to test and demonstrate their stability and reflexive aptitude. An article parodying the robot abuse phenomenon includes a testimonial interview with a Boston Dynamics quadruped model named “Big Dog” which is presented as evidence of the physical and

emotional pain experienced by the robots and suggests there is an urgent need for testing protocols to have higher ethical and safety standards. [18] When analysed in relation to the history of abuse found in the training of slave catching dogs and police K9s, the phenomenon of robot abuse offers revelatory implications on the epistemic processes involved in the algorithmically driven development of quadrupedal robots and the social dangers of using zoomorphism to implicate that these machines can feel pain. The phenomenon of robot abuse contrasts the abuse of biological canines as a disciplinary training method due to the intention with which the practice is made so visible to the public, whereas the abuse of canines is largely kept behind closed doors to prevent public scrutiny. Videos of robot abuse have a dual impact on public perception by simultaneously eliciting sympathy and instilling an uncanny sense of fear through its display of the robot's motile resilience to human impediments. Viewers are thus left with the impression that the robot has the capacity to both feel pain and withstand concerted efforts for intervention, cultivating an emotional reluctance to harm the robot and an awareness of human impotence to the operations of the machine. I posit that the hostility with which the robots are obstructed from their path is indicative of anticipation for oppositional human confrontations and attempts to disable the robot by people interacting with it in the real world.

Quadrupedal Robots Deployed by the Police and Military

When utilized by the NYPD through a contract-based trial in 2021, the Spot model was first deployed to a low-income neighbourhood in the Bronx in response to a call about a home invasion and was later used by officers in a public housing building in Manhattan. [19] The immediacy with which usage of Spot was directed toward low income and communities of colour resulted in fierce public backlash condemning the ongoing use of technology to intensify the already aggressive policing practices that marginalized people are subjected to. However, this outcry only resulted in the temporary removal of Spot from the NYPD and did not prevent the department from purchasing two new Spot robots intended for permanent instalment to the sum of \$750,000 USD in April of 2023. The Honolulu police department has also received criticism for spending \$150,000 of their federal pandemic relief funding to obtain a Spot model that was deployed to a homeless encampment to check the temperatures of houseless persons and mark those with fevers for quarantine in a routine that was reportedly executed on numerous occasions. The LAPD, the Massachusetts state police, and the St. Petersburg, FL police department are among the other U.S. based police institutions that have followed suit to obtain a Spot quadruped. Spot's distribution to state authorities is not restricted to domestic agencies, as this quadruped model has been dispatched to police facilities in Western Australia and Germany as well as to the French military. Boston

Dynamics stated in 2022 that they had more than 1,000 Spot models operating in 23 countries. However, the corporation asserts that they do not maintain records demarcating which sales have been negotiated with police departments and militaries as opposed to commercial sectors, resulting in a serious lack of transparency regarding the quantities at which state authorities are obtaining Spot robots and the locations where they are being actively deployed on behalf of state forces. Though Boston Dynamics has historically made quadrupedal robots designed for military usage such as the "Big Dog" model developed in collaboration with DARPA, the corporation has defended their recurring business cooperation with state forces carrying well established reputations for engaging in unethical uses of force and acute violence against marginalized people by declaring that augmenting Spot with weaponry is strictly prohibited and robots found to be in breach of this restriction will be remotely disabled. [19] [9]

Despite this declaration, the San Francisco police department successfully passed a motion to allow autonomous robots in their possession to be rigged with lethal explosives intended for human execution in scenarios designated extreme enough to rationalize such ethically fraught conduct. The motion was only rescinded after sparking considerable public backlash and could foreshadow operations to be performed by police owned robots in the near future once such practices have been deemed socially acceptable. [19] Such a future would mirror the states overriding of public resistance to the issuing of Spot to police departments which were ineradicably reinstated merely two years after being revoked due to vehement critical response. Ghost robotics, which has manufactured the Vision 60 quadruped robot, decidedly has no qualms about their model being outfitted with industrial grade weaponry and even made headlines alongside Boston Dynamics after unapologetically exhibiting a Vision 60 model equipped with a machine gun at the United States Army 2021 national conference. [20] The gun wielded by the Vision 60 is known as the "special purpose unmanned rifle" which was developed by arms corporation Sword International and specifically designed to be mounted onto a range of robotic platforms. The U.S. army has since begun endeavouring to test the functionality of Vision 60 models armed with assault rifles, affixing M4A1 carbines and Sig Sauer XM7 rifles to quadrupedal robots owned as military property and conducting experimental operations to simulate their performance on the battlefield. [21] Unarmed Vision 60 models have been actively deployed at a multitude of air force bases across the U.S. and in territories surrounding the U.S./Mexico boundary by military personnel and border patrol agents in pursuit of their services for perimeter surveillance. [22] The Border Security Expo held in El Paso, Texas in May of 2023 featured Vision 60 models that were advertised as "ruggedized robots" and displayed by commercial vendors alongside drone, taser,

and thermal imaging surveillance systems promoted for being at the cutting edge of security technologies. [23]

Machine Learning and Race

The most prominently stated purpose of utilizing quadrupedal robots as a police and military weapon is to conduct surveillance and collect data, making problems of algorithmic bias and the asymmetric severity with which black and brown people are already surveilled by the police and attacked by police dogs vital to forming an understanding of how such robots will be interfacing with the public and shaping social reality while performing their programmed duties. The dynamics of racialized violence which are central to the operations of the police, military, and border patrol agencies are also present in the ideological motivations driving the institutional demand to obtain quadrupedal robots. Contemporary imperialist states such as the U.S. government have accrued immense amounts of wealth and political power through the ongoing advancement of systemic exploitation first established during the European colonization of the Americas dating back to the 1600s, in route to securing the global domination of the capitalist system. Extreme violence and genocide were perpetrated against indigenous peoples by colonialists who sought to forge a social hierarchy of white racial superiority in order to force the surviving populations into slavery and ensure their own unregulated control over an army of unpaid laborers made expendable to the aims of capital accumulation. After decimating indigenous populations and coercing those remaining onto impoverished reservations pushed out of sight at the fringes of settler society, the colonialists turned to Africa as a site for kidnapping and enslaving over 12 million sovereign peoples that would absolve them of the costs of labour power and allow for the mass hoarding of stolen wealth. [24] As described at the start of this paper, dogs that were supposedly trained to “see race” played a vital role in the organized efforts of colonial leaders to orchestrate acts of planned violence and torture against black and brown peoples that would inhibit their collective outrage at the injustices of the colonial system from mobilizing into a mass overthrow movement. [4] Today, the stability of the capitalist system still exists in a place of unresolved precariousness perpetuated by the methods of exploitation further exacerbating the increasingly dire material conditions on Earth. Ongoing waves of political unrest generated by growing proletarian discontent with the untenability of wage slavery will continue to boil over into formidable uprisings as the contradictions of capitalism heighten class antagonisms and attacks perpetrated against marginalized people by oppressive regimes inspire an unbridled conviction of rage in the masses to be channelled back at colonial/imperialist state violence. [25] Populations of black, brown, and indigenous peoples located in countries of the global south, middle east and Asia that have faced abject subjugation at the hands of imperial powers are anticipated to migrate to countries within or more closely adjacent to those

positioned in the imperial core in order to escape the malignant despair of inequality and uninhabitable environmental conditions made worse by climate change, resource depletion, and supply chain shortages. [26] In an effort to neutralize and reduce the scope of prospective threats, the capitalist state works to progress the instruments of surveillance driven violence against the collectives of poor and racialized people who have been marginalized as an othered social class whose realizable liberation is at odds with the preservation of white supremacist class society. [27]

In *The Black Technical Object*, author Ramon Amaro discusses the machinic alienation imposed upon black people as their racialized existences are quantified and apprehended by machine learning algorithms, especially those which are designed for societal interfaces and governmental applications. Amaro delves deeply into historical analyses of the mathematical and statistical practices which contemporary machine learning algorithms are based upon to offer critical insights into the impact of machine learning practices on racial constructions driven by neoliberal objectives, and vice versa. Amaro’s underlying thesis argues that racism is inherent to machine learning due to the algorithms which remain foundational to the field originating in mathematical equations designed to conduct population statistics during a historical period saturated with eugenics and race science. Decolonial theories conceived by Franz Fanon throughout his seminal works such as “Black Skin, White Masks” are brought into conversation with an array of complementary philosophical propositions such as Michelle Foucault’s theorization of biopolitics, to reflect upon the processes of classification and discipline through which data takes shape as state power. [28] Such theoretically grounded contemplations provide an indispensable framework with which to conceptualize the inferential evolution of systemic racism and discriminatory policing practices being instigated by the burgeoning integration of quadrupedal robotics into state agency operations. Particular emphasis placed by authorities on the intended role of quadrupedal robots as tools of surveillance will provide direction toward the aim of formulating an analysis of the epistemic processes involved in training algorithmically powered robots to conduct police labour with which to compare against the training methods applied to their biological counterparts. Theoretical efforts taken to accomplish this goal will focus on teasing out the ideological conventions of racial bias that are incorporated into the perceptual faculties of the machine to speculate about the extent to which the discriminatory behaviours exhibited are an intrinsic or acquired feature of machine cognition.

Amaro posits that machine learning enables an unprecedented penetration of racial logic into the social milieu. He further supports this claim by stating that; “Machine learning can mediate the consistency of racist logics by positioning the Black, brown, criminalized, and otherwise Othered body as always already sites of

investigation.” This postulation points to the sociogenic origin of the Eurocentric logics of racial difference that have come to permeate all facets of colonial/imperial society through the institutionalization of white supremacy. Such Eurocentric logics of racial difference locate white European males as the standard of normative identity from which all other persons are evaluated in terms of their perceived likeness to or deviation from the set of characteristics associated with what has been determined as the prototypical white European male. These processes of social categorization have operated to place white males in positions of authority and power while positioning racialized peoples as subjects to be controlled through their ongoing surveillance and subjection to disciplinary measures engineered to criminalize blackness and all others ascribed to be non-white, as a state function. [28] Machine learning models have recurrently replicated these hierarchized social categorizations skewed in favour of white men even in the absence of deliberate intentions set by the creators to program an algorithm to produce racially biased results. Responsibility for the prejudices displayed by machine learning software is often attributed to the programmers themselves being white men who, misguided by their privileges, fill the training models with data which almost exclusively reflects the physical representations and social affordances tied to their own identities. [29] However, though one could contend that machine learning practices are predicated on the exclusion of Black communities, exclusion alone cannot account for the entirety of algorithmic racial bias. Amaro further prompts readers to consider how anti-Black violence has helped shape technical knowledge and surveillance, while simultaneously rendering Black bodies non-existent. [28] This provocation inevitably leads to an assessment of the prison industrial complex which is liable for the disproportionate rate at which young black men have come to experience the highest levels of incarceration. The carceral logic underlying the operation of the U.S. prison system works in tandem with the logic of racism to rationalize evidence which indicates that Black youths are incarcerated to excessive and unjust degrees. [30] Functioning in parallel to the prison system, ICE detention centres are occupied to near capacity with immigrants from Mexico, Central, and South America. [31] Though documents revealing what criminal record data, if any, is being fed to state employed quadrupedal robots have not been disclosed to the public, one must assume that the databases of arrest records and crime reports currently informing “predictive policing” models will ultimately become accessible to autonomous robots for facial recognition based cross checks among other surveillant sorting methods oriented around stored data reference points. [32]

As most surveillance algorithms designed for facial identification, object detection, or crime prediction must rely on some form of pattern recognition to operate, the scope of black and brown faces which predictably dominate the data to be referenced as stored knowledge

works to further cement racialized communities as being the primary targets of policing practices. [33] Amaro asks “as facial recognition becomes an increasingly important lens through which we understand the world, how can Black technical objects generate new possibilities outside of phenotypical calculation, prototypical correlation, and the generalization of category?” [28] An article titled “Racial categories in machine learning” offers a response to this query by first examining the fundamentally ocular component of race and the political origin of racial categories which are legally and socially constructed based on one’s biometric properties, socioeconomic class, and ancestral, national and geographic origins. [29] The authors assert that racial categorization is not a static phenomenon but a malleable feature of social existence that is subject to change based on the shifting spatio-temporal contexts ascribing racial categories to individuals in legal and social terms. The authors proceed to analyse the A.I. driven computational processes which either intentionally or unintentionally reproduce racist discrimination by distinguishing these machine learning systems into three categories; those which are themselves racial projects, those that allow their users to engage in racial projects, and those that attempt to be “blind” to race. They attribute this model to the work of Omi and Winant who determine a racial project to be racist “if it reproduces structures of domination based on racial significance and identities” and antiracist “if it resists or undoes structures of domination based on racial significance and identities.” System software is deemed a racial project if it engages racial categories through the words, concepts, or social structures that abstractly represent racial differences. Software which attempts to be blind to race is noted to correspond roughly with institutions of racial hegemony to reflect a status quo of racial inequality without directly engaging in it. When determining which designation best characterizes a particular software, variables such as the input and output data of the system as well as the political motivations of the software designers and data collectors play a key role. Through attempting to design their own ‘anti-racist’ software, the authors delineate just how difficult this endeavour is by exposing the susceptibility of such projects to reify biased racial categories or generate data which could in turn be used for a discriminatory racial project. [29]

The theoretical contributions of both publications come together to deconstruct the racial biases derived from A.I. software that will inevitably shape the social impact and function of quadrupedal robots working for the police and military. The surveillance software embedded in state owned quadrupeds can effectively be determined as a discriminatory racial project due to the inherently racist political motivations of the entities they are designed to operate for, the likely presence of input and output data which reflects racist carceral logic and xenophobia, and the social stratification and segregation priming communities of colour to be targeted for surveillance. Amaro states “By claiming ultimate authority over the management of colonial space, the

colonizer is able to construct an image of himself as the ideal secular being, one that is sanctioned by illusions of divine will. These illusions were supported by the distribution of scientific knowledge, which -in terms of the racialized- is enacted through eugenics-based operations.” [28] The deployment of quadrupedal robots to serve as multi-terrain tools of state surveillance initiates a novel mode of colonial spatial management, which operating under the false guise of algorithmic objectivity will only render the discriminatory practices and racial violence conducted by the police and military into more efficient forms. Accountability for police/military harm and misconduct is projected to disintegrate as the operations facilitated by the robots can be claimed to have been guided by the neutral rationale of technoscience.

Conclusion

As the incorporation of biological K9s into policing practices was instigated in reaction to the unprecedented impact of the 1950s civil rights movement on white hegemony in U.S. society marked the historical reinstatement of institutionalized canine violence originating in the practices of slave catchers, immediate action taken to procure and program quadrupedal robots by the police following the monumental resurgence of the Black Lives Matter Movement in 2020 is but the latest weaponization of canines as tools of white supremacist organized terror. The biomimetic mechanization symbolic of the canine exterior reformulated as quadrupedal robots designed for policing operate in direct historical relation to offensively recent events of racist trauma enacted through biological dogs. Quadrupedal robots exist at a point of convergence between the historical trajectories of biological canines and cyber technologies developed as tools of state sanctioned discrimination. The quadrupedal robot occupies cultural space as an entity which exhibits the semiotic representation, socio-cultural functions, and physical motility of the biological canine while simultaneously possessing the mechanical construction, A.I. powered cognition, data access/storage, cybernetic connections, sensors, and audio/visual equipment at the cutting edge of autonomous robotics. This duality grants the quadrupedal robot the ability to perform in roles formerly carried out by biological dogs on behalf of state forces while maintaining the information processing powers of the machine, effectively granting terrestrial spatial autonomy to the A.I. driven surveillance software and weapons systems that have been developed for application by the police and military.

The intersectional formation structuring the sociocultural identity of quadrupedal robots to be situated between ideological notions and symbolic representations of both canines and machines cultivates false connotations of the biological and technological processes involved in their respective training and exhibited behaviours. The cycle of influence shaping the commingled development of artificially intelligent systems with evolving

understandings of biological cognition and embodied perception deterministically unfolds into distinct epistemic processes undertaken to embed observably racist behaviours into both the machine and the canine. These processes provoke investigation of the comparative constructions of race woven into the internal semiotic systems of computational and biological agents. The algorithmic designs which underlie the perceptual faculties of machines become physically embodied in the sensors and actuators comprising the robot’s hardware but lack the reciprocal interactions of stimuli feedback experienced by the biological agent’s engagement with unpredictable environments since birth. [34] Parameters determining functions such as the classification of objects by the machine are predefined according to standards set by the programmer for labelling data inputs in terms of their proximity to or deviation from the acceptable range of quantifiable characteristics which define its semiotic significance to a given series of conditional statements. Biological canines build cognitive associations through negative and positive reinforcement training used to elicit responses of distress or pleasure to different stimuli. The algorithmic operations of the quadrupedal robot which replicate racial discrimination function based on vast amounts of input data classified according to the dimensions of inequality and stigma ascribed to racialized individuals by social institutions whereas external informational stimuli must be recurrently staged in the environment of the canine for discriminatory behaviour to manifest as both a physiological reflex to stress and an effort to receive praise. The racist behaviour of the quadrupedal robot and the biological canine are both built upon social categorizations of race which defend the political domination of whiteness and criminalize people of colour, further propagated by the racial demographics of the social contexts they are most frequently deployed to police.

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