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MACHINIC EUGENICS OF THE GAZE: COMPUTER VISION, AGEISM, AND GENDER

EUGENIA MAQUÍNICA DO OLHAR: VISÃO COMPUTACIONAL, ETARISMO E GÊNERO

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Abstract

This article analyzes computer vision as a device that shapes the contemporary gaze and points to its political and aesthetic implications in everyday social life. The text discusses the social production of data, highlighting the racist, ageist, and misogynistic biases of artificial intelligence (AI) architectures for synthesizing images, commenting on the biopolitics embedded in these processes. Special attention is given to computational biometric techniques, such as facial recognition, highlighting their connections with Francis Galton's composite portraits, which he called "statistical paintings," and their dissemination in the contemporary imaginary. The text considers how computer vision—and its pattern-based structure—updates the foundations of the eugenic imagination. It defines fields of visibility that will not imply genocidal racial wars but algorithmically exclude certain subjects and bodies from the social and political field. Based on ongoing artistic research (*Poisonous, Noxious, and Suspicious*, about forbidden plants and women erased from the history of art and science), the article points to the need to deconstruct the potentialities of the emerging machinic eugenics of the gaze through counter-hegemonic practices, and images that deviate from the norm, elaborated from the Global South.

Keywords: Computer Vision, Eugenics, Ageism, Racism, Women

1 Introduction

Computer vision is a system that reads, interprets, and extracts data from digital files. Its broad application encompasses OCR (optical character recognition), medical examinations, search engines, 3D modeling, surveillance, biometrics, self-driving cars, and various image editing techniques (Szeliski, 2011). Present in various activities, computer vision systems operate as filters and lenses in our daily lives and, in this sense, are understood as "devices." In terms of Michel Foucault (Foucault, 2008, pp. 93-94), later updated by Giorgio Agamben, the device refers to "a heterogeneous set, linguistic and non-linguistic, that includes virtually anything under the same title: discourses, institutions, buildings, laws, security measures, philosophical propositions," resulting "from the intersections of power relations and knowledge relations" (Agamben, 2009, p. 29, our translation).

It is through this intersection between power relations and knowledge relations that computer vision is discussed in this essay. By "interpreting" images, computer vision algorithmic models shape fields of visibility and invisibility, producing new forms of exclusion and control. Interpretation, in this case, does not involve hermeneutic operations. Just as computers do not see, they also do not understand images at any level of representation. The image has no semiotic or aesthetic meaning for machines. In technical terms, it is a matrix of points and blocks, which allows artificial intelligence (AI) to identify patterns such as edges, shapes, textures, curves, corners, and colors, grouping them through filters. Therefore, computers do not see, much less simulate human vision. This seems obvious, but the recurrence of metaphors around AIs makes this primary instance opaque.

This type of metaphor structurally refers to this technology's anthropocentric and colonialist paradigms. First, there is the basic assumption that to be intelligent is to be human. That intelligence must mirror attributes such as human vision or natural language processing (NLP), where "language" means human verbal language, with American English as the standard for its modeling. No less relevant is the assumption that intelligence is an exclusive attribute of the human brain, even though different multispecies and cosmopolitical approaches, such as those of Donna Haraway (1991, 2016), Eduardo de Castro (2018), Anna Tsing (2022) and James Bridle (2023), among many others, show that, within the scope of current scientific research, this assumption does not hold up. This does not mean that the attribute of intelligence cannot be associated with machinic systems. It simply means that there are distinct forms of intelligence besides human intelligence, the subject of a dizzying essay by Brazilian semioticist Lucia Santaella (2023).

Problematizing the anthropocentric foundations that underpin metaphors such as neural networks, which refer to our brains and seek to compare human and non-human systems and ways of being, is beyond the scope of this article. However, it is essential to note that when we refer to computer vision, we refer to a type of machine learning (particularly convolutional neural networks, or CNNs). Deep learning *involves* the development of algorithms and statistical models that allow computers to learn and make decisions or predictions based on data without being explicitly programmed to perform a specific task. Despite differentiating AI from all the technologies that preceded it, its

generative potential does not make artificial intelligence an abstract framework that applies its rules to an autonomous parallel universe. It is a cultural construct firmly rooted in historical dynamics of power and exclusion that are the starting point of any artificial intelligence model: the datasets used in machine learning from which a model will result.

2 The Society of Biased Data

Several studies show how biased data reinforces gender and racial stereotypes and makes black people more vulnerable in surveillance systems and potentially excluded from job selection and intellectual recognition processes (Buolamwini, 2017; Noble, 2018; Silva, 2020). In addition to system errors, these occurrences need to be understood as instances of the social production process of data. The health sector, in which AI is becoming increasingly essential, is a fertile field for this understanding, given that biased data can determine access to specialized services and, therefore, the right to life or not. This is the case of an algorithm analyzed in a study on automated triage processes in American hospitals. The AI model in question uses as its main anchor the total costs already invested in a patient to determine their priority for care, without considering that the health system in that country historically spends less on black patients because they have, for a series of social issues, less access to these services. By disregarding this "variable," automated screening reinforces processes of racial injustice and highlights the social and transdisciplinary scope of the impacts of using artificial intelligence (Owens & Walker, 2020, p. 1327).

Therefore, biased data does not "emerge" from AIs, so the debate on different data review strategies has involved many experts. In this sense, it is suggested that information about the collected data be made public (Zou & Schiebinger, 2018) and that technologies be developed to debug distorted information (Steed & Caliskan, 2021). However, algorithms do not perform their tasks spontaneously. Analyzing ImageNet, a *dataset* used by many computer vision systems, Crawford and Paglen showed the genealogy of the biases they embed, starting from labeling the data that will feed the development of an AI model. As an illustration, we will take the category "human body," which was analyzed by the authors. It is in the branch Natural object > Body > Human body, and its subcategories are distributed between males and females, according to their age profile (adult or juvenile). “The “adult body” category contains the subclasses “adult female body” and “adult male body.” We find an implicit assumption here: only “male” and “female” bodies are “natural.”” (Crawford & Paglen, 2019).

Workers hired for specific tasks on remote platforms such as Amazon Mechanical Turk (AMT) often initiate the labeling process. These workers constitute an emerging global precariat, performing decontextualized and atomized tasks in a platformed labor system. Underpaid and unprepared to interpret images, they reveal what Marx, in his Economic-Philosophical Manuscripts of 1844, defined as alienation in the labeling processes: the disconnect between the work and the worker's experience (Moreschi et al., 2020; Grohmann et al., 2022; Dias, 2024). Economic and geopolitical factors also contribute to the creation of biased data. The increasing use of unsupervised systems, which employ models pre-trained on unlabeled images, amplifies misidentification and bias. Thus, pre-trained models used in facial recognition for security can be applied in employment selection processes, perpetuating these biases in the screening process (Harwell, 2019; EPIC, 2019).

Finally, the other factor in the biased data production chain is geopolitical. In computer vision, 45% of the 14 million labeled images on ImageNet come from the United States, constituting 4% of the global population. In contrast, China and India, representing 36% of the global population, account for only 3% of the images in the same database (Zou & Schiebinger, 2018). Thus, it is understood that data asymmetry, more than a technical problem, reflects asymmetries of power of a social, economic, and political nature, which underpin the practices of datacolonialism or data colonialism. The notion of data colonialism assumes that "the social relations embedded in data are part of a broader colonial (and not just merely capitalist) legacy" (Couldry & Mejias, 2019, p. 84). Playing out power dynamics, these relationships do not replace traditional forms of expropriation and include mechanisms of social invisibility through standardization processes in a new form of eugenics, which I call machinic eugenics of the gaze.

3 Towards Machinic Eugenics

"Eugenics" is a word derived from the Greek *eugenes*, meaning well-born, of good stock, and noble race. The British scientist Francis Galton (1822–1911) coined the term in 1883 in his book *Inquiries into Human Faculty and Its Development*. His motivation was to counteract the "slowness" of the processes of natural selection that Darwin, his second cousin, theorized and to "improve" the human species. Proposed as a science, eugenics soon became, in the 1920s, a social and international movement (Turda, 2022, p. 2741). In 1907, the Eugenics Education Society of the United Kingdom was founded in England. In the same year, the first laws on the sterilization of blacks and the

prohibition of interracial marriages were passed in the United States. The Eugenics Record Office existed under that name until the late 1960s (National Human Genome Research Institute, 2021; Stern, 2011). Another country at the forefront of this field was Brazil, whose Eugenics Society dates back to the 1920s. Led by physician Renato Kehl, it had several enthusiasts among the Brazilian intelligentsia of the time, such as Monteiro Lobato, Paulo Prado, and Alfredo Ellis Jr., among others (Wegner & Souza, 2013; Souza, 2024).

In Germany, where the Medical Society for Sexology and Eugenics (Ärztegesellschaft für Sexualwissenschaft und Eugenik) had been active since 1913, eugenics became official state policy from 1933, during the Nazi era, and resulted in an alarming number of deaths: 6 million Jews, 250,000 gypsies, at least 200,000 mentally ill people, an unknown number of blacks, and many thousands of homosexuals, communists, and political opponents, classified as “antisocial” (Beiguelman B., 1997; Amidon, 2008). To develop his eugenic theories, Galton created a photographic method, which he called “composite portraits,” superimposing several faces with multiple exposures on the same plate and erasing all individual characteristics to obtain a generic face that identified a specific biological and social profile (Figure 1). The aim was to achieve "with mechanical precision a generalised picture; one that represents no man in particular, but portrays an imaginary figure possessing the average characteristics of any given group of men" (Galton, 1879, pp. 132–33). He inferred this supposed precision by interpreting his methodology as a form of "statistical painting" in 1883 (Galton, 2001, p. 233), moving from the perceptible to the datafied, or from the empirical to the "irrefutable" scientific proof (Sekula, 1986, pp. 18–22; Lee-Morrison, 2019, p. 95).

Fig. 1: Composite portraits of the “Jewish Type” by Francis Galton, c. 1877-c. 1890. (Wellcome Collection). Available at: https://wellcomecollection.org/works/ngq29vyw. Accessed: 03/11/2024.

The links between the history of photography and biopolitical control have been widely discussed and refer directly or indirectly to Michel Foucault's seminal analysis of the panopticon (Foucault, 1999; Machado & Huber, 2010; Fischer, 2019; Azoulay, 2019). However, no discriminatory scientific discourse supported by images has had the influence and longevity of the ideas and methodologies created by Galton, impacting everything from facial recognition to the revival of eugenics in contemporary biotechnologies in the context of the debates on the Human Genome Project[1]. In Galton's view, his technique of composite portraits would contribute to the "improvement" of the British population. In terms of computer vision, neural networks, whether convolutional (CNNs) or generative (GANs), do not have these purposes but operate similar processes when searching for identities between the different data in an image, discarding the particularities to synthesize other new images (Figure 2).

1 The eugenic theories mobilized under the pretext of the Human Genome Project (HGP), the largest collaborative scientific project in history, and the strong emphasis on genetic algorithms that accompany them transcend the limits of this article and were addressed by the author in another publication, in which she clarifies not the eugenic vocation of the PGH, but its instrumentalization in this perspective. (Beiguelman, G. 2023, p. 103-138).

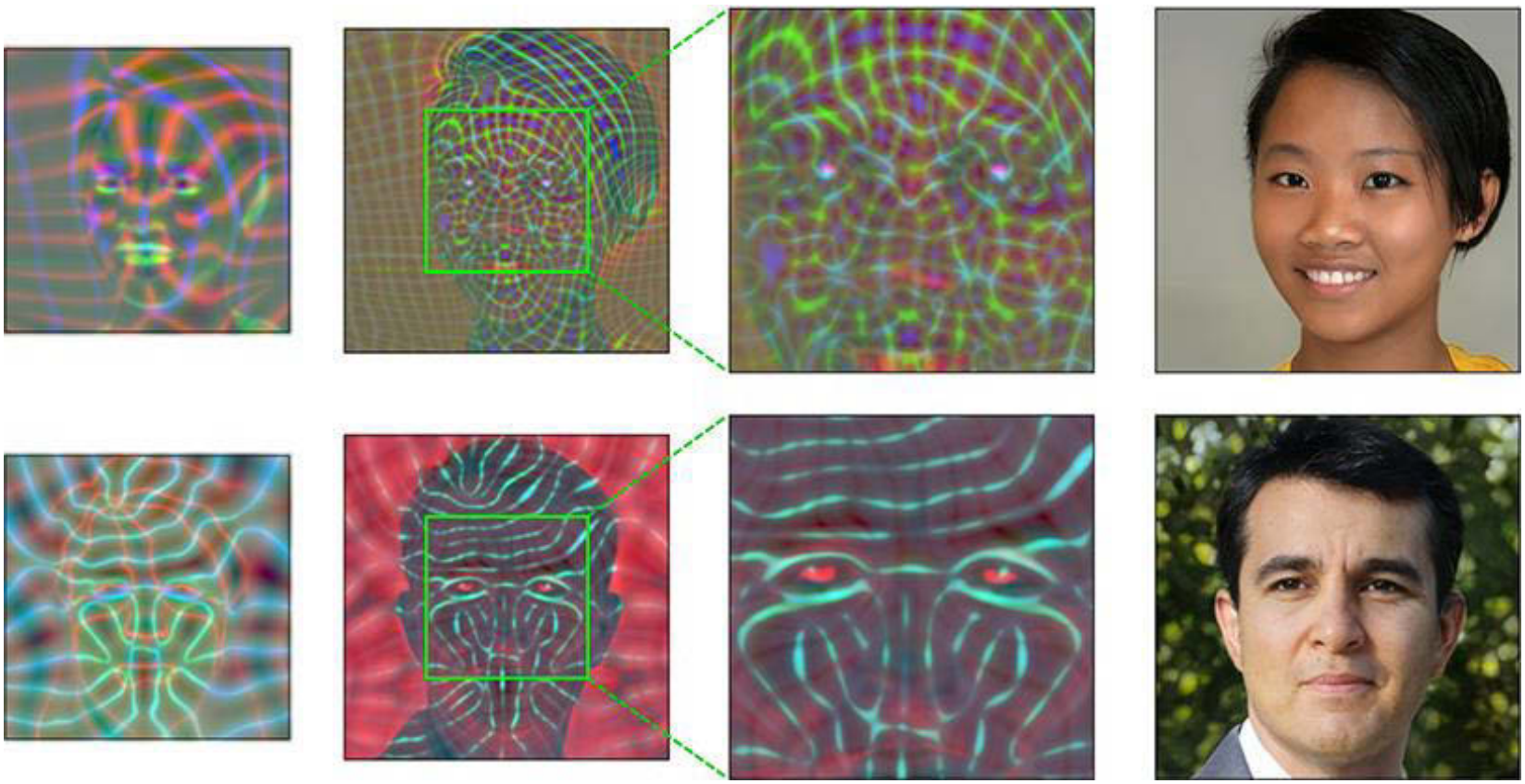

Fig. 2: A comparative study between three GAN models shows the analysis of internal patterns of images until they reach a generic face. Source: Karras, T., Aittala, M., Lain, 2021. Available at: https://nvlabs.github.io/stylegan3/. Accessed on 11/03/2024.

4 From Pictorial Statistics to Statistical Photography

Galton called his composite portraits "pictorial statistics" not for the rhetorical effect of the definition but because he is the father of regression statistics, a paradigm of any machine learning process (McQuillan, 2022, pp. 86-92). Although these neural networks use deep learning techniques beyond traditional regression methods, this concept is still relevant for adjusting parameters during the model training process to find the line (or curve) that best fits the data. From this perspective, it can be said that:

> Most of the contemporary applications of machine learning can be described according to the two modalities of classification and prediction, which outline the contours of a new society of control and statistical governance. Classification is known as *pattern recognition,* while prediction can be defined also as *pattern generation*. A new pattern is recognised or generated by interrogating the inner core of the statistical model. (Pasquinelli & Joler, 2020, p. 13).

The problem with this statistical standardization system becomes more serious when one takes into account the importance of social networks today and the significant increase in pre-trained vision and language models (VLP), leading to distorted representations of specific social groups, such as black people, women, and transgender people, and contributing to the unequal distribution of resources and access (Lee et al., 2023), which echoes the eugenic principles of selective advantage based on appearance traits. No less relevant than the selective approaches of AIs about race, gender, and sex are discussions about ageism, making older adults practically invisible on networks and in health services or job recruitment, of the type we discussed at the beginning of this article. Note that these biases are projected in an intersectional way so that they become increasingly oppressive and socially unjust as individuals add characteristics that place them in several groups simultaneously (black, transgender, and older people, for example; or cisgender and older women, and so on).

In AI ageism: A critical roadmap for studying age discrimination and exclusion in digitalized societies, Justyna Stypinska (2023) addresses the issue of ageism in the context of artificial intelligence and its social impacts. To this end, she identifies five interconnected forms of ageism: age-biased data (technical level), stereotypes and prejudices of actors such as AI labelers and programmers (individual level), lack of debates about old age in AI discourses (discursive level), discriminatory effects of the use of AI technology on different age groups (group

level) and their exclusion as users of AI technology, services, and products (user level, through different types of interface design). Thus, despite the aging population, on the one hand, and the increasing digitalization, on the other, which should be elements of pressure for greater attention to the issue, what is happening is precisely the opposite, converging to transform a treacherous synonymy between health, youth, whiteness, perfection, and competence into a standard.

4.1 Eugenics Never Ended

Beauty fiction is crucial in eugenic dynamics, mediating social interactions on popular platforms such as Instagram and TikTok. Offered as filters and editing tools that allow users to alter their appearance, these apps function as devices to conform to specific beauty standards, promoted and marketed on these platforms. Popular apps such as Facetune, AirBrush, Perfect365, and YouCam Makeup feature filters to lighten skin tones, reinforce traditional gender roles, such as long eyelashes for women or a strong jawline for men, and smooth out wrinkles. In addition to provoking feelings of inadequacy and low self-esteem, especially among young people (Chaderjian, 2022; Rowland, 2022), these "beautification" apps embody eugenic assumptions that deserve consideration within the scope of this article. The correlation between standardized beauty ideals that generally extol whiteness, thin bodies, and youth, especially women, is striking (Gehl et al., 2017). While this type of "cosmetic gaze" is not expressed in past racial cleansing policies and is not a result of, or specific to, social media, it also emphasizes a constant repackaging of oppressive cultural standards that used to target women (Wegenstein, 2012, p. 151).

The claim about the eclipse of eugenics after World War II is recurrent but not valid. Eugenics never ended, now masquerading as “newgenics”, a concept that philosopher Robert A. Wilson uses to discuss how the eugenic mentality manifests itself in contemporary society, focusing on certain bodies and social subjects based on biotechnological advances. Instead of being characterized as unfit or degenerate, as in Nazism, bodies evaluated as outside the norm are "regarded as less healthy" or as having "medical irregularities or abnormalities." They are thus subjected not to "state-mandated practices of euthanasia and sterilization " but to practices of "prenatal screening and selective abortion offered as matters of individual reproductive choice" (Wilson, 2017, p. 176). What we see in this strategy is a new guise of the myth of the standard of normality. The widespread dissemination of artificial intelligence technologies calibrates this myth. Given that the controversial concept of standard, a prerogative of any definition of normality, is fundamental to processes involving machine learning.

The biopolitical aspect of this binomial (regular/standard) allows us to situate current forms of AI image processing in a broader perspective, understanding their invisibility procedures within the framework of a set of social and political vectors, in which one can consider the possibility of an emerging machine-like eugenics of the gaze. It is unlikely that AI will be able to control our gaze in the sense of physically forcing us to look at something. Even so, computer vision techniques can influence what we see and what we pay attention to, shaping the visuality and invisibility of certain bodies and subjects. In this sense, this article assumes that when we speak of vision, we also speak of its forms of social fabrication. Suppose vision is a biological attribution and visibility a social fact (Foster, 1998). In that case, the gaze is the interaction of both aesthetic regimes, the political field that “defines what is visible or not in a common space" and who can or cannot have a part in that space (Rancière, 2004, pp. 12-13), like the elderly women, who have become one of the challenges of an artistic research project I am currently working on.

5 Poisonous, Noxious, and Suspicious

The project explores models based on the so-called Natural Language, which creates images from texts and other images. I borrowed its title, *Poisonous, Noxious, and Suspicious*, from a 19th-century scientific manual published in England by the Christian Scientific Society, written by Anne Pratt (1857). The focus is on plants that were banned by the colonial "civilizing" process due to their use in sacred rituals, hallucinogenic and aphrodisiac powers, and ancestral healing practices that are often confused with religious practices. Several of these banned plants were, over the centuries, "reintegrated" into society and privatized by the pharmaceutical industry, such as *Cannabis*, various artemisia derivatives, and curare. Others continue to be surrounded by misogynistic prejudices. I draw them with artificial intelligence, using as reference botanical illustrations of women erased from the history of art and science, creating speculative biographies that intersect the stories of these botanists with those of "suspect" plants.

This is not about advocating for the total release of the consumption of these plants, ignoring that their toxicity depends on dosages and knowledge (ancestral and scientific), but about recognizing the cultural and economic foundations that banned them (Baratto, 2022; Luz,

2015). Even because several plants, such as "carnivores" (in reality, insectivores) and orchids, about which prejudices abound, refer not to their toxicity but to heterologies, as "sciences of the other," shaped in the process of colonization (Souza, 1993, pp. 24-25). They also refer to the stories of fear in the face of the different othernesses that have demonized women since the Middle Ages as "agents of Satan" and malevolent figures (Delumeau, 1989, pp. 310-344).

However, during my research, I noticed a particular recurrence of tragic stories that led several of these pioneering scientists to die abandoned, sick, and alone, with posthumous recognition centuries after their death, such as Maria Sybilla Merriam (1647-1717), the first to identify the process of metamorphosis of caterpillars into butterflies. This is also the case of mycologist Maria Elizabeth Banning (1822-1903), whose beautiful manuscripts and watercolors were accidentally found behind a chicken taxonomy cabinet in a museum in New York in the 1980s. Based on these and other stories, I decided to create fictional portraits of these scientists, combining the few images available online with the plants and aesthetics to which they dedicated themselves (Figure 3).

Fig. 3: Processing of Maria Sybilla Merriam's portraits with Artificial Intelligence from a drawing published in James Duncan, *The Natural History of British Moths*, Sphinxes, & co. (Edinburgh, 1841). Source: Author, 2024.

However, none of these stories interested me as much as that of the Brazilian Maria Bandeira (1902-1992), the first female botanist at the Rio de Janeiro Botanical Garden. A bryophyte specialist, she collected and identified more than 500 specimens of plants, fungi, and lichens in the 1920s. Bandeira was never recognized because, as she did not publish the results, her authorship was ignored by the men who controlled the scientific journals (Bediaga et al., 2016). In short, Bandeira did everything that became synonymous with impetus for scientists and confined women, at best, to the attribute of "adventurers" (Lopes, 1998). Despite all these obstacles, she exchanged extensive correspondence with foreign specialists and even studied at the Sorbonne in France. She was on a successful scientific path when she decided to join the Order of Discalced Carmelites and move to a convent in Rio de Janeiro's Santa Teresa neighborhood, where she lived in full monastic enclosure. Experts say that this may have been related to the death of her parents, the emotional breakup with her brother, and the loss of an essential scientific reference, Viktor Ferdinand Brotherus, who died in 1929.

I wonder if it was not her brother who confined her to the convent. I also speculate whether Brotherus was her great love and secret companion, whose absence she could not bear. I imagine Maria Bandeira living among her bryophytes, working at the Rio de Janeiro Botanical Garden. I struggled for two days with artificial intelligence to make her portrait at 90. The mechanical eugenics of the gaze, due to all the issues previously discussed (biased data, asymmetry between the number of images of young and old women, abundance of "beautification" resources), is my main obstacle. I realize that it is challenging to work with wrinkles, especially in women over 30 and with eyes that are not blue. I took a rare photo of her outside the laboratory, at the Botanical Garden, as my starting point. She is the only woman among several men, and I erased them all, in addition to colorizing them, to facilitate the work process of artificial intelligence (Figure 4).

Next, I summarized her portrait as a happy octogenarian in her workspace. In the first result, the AI assumed I was referring to a black woman when I spoke of a Brazilian personality. To this end, I use text-to-image and image-to-image processing resources on platforms such as Runway and DALL-E, starting from an exhaustive search of images and bibliographies in scientific collections and libraries. I describe her as white, and the results refer to a stereotypical view of old age, of a dejected woman, echoing gerontophobic approaches (Butler, 1969; Esteban, 2021). To get around the problem, I insert into the prompt the information that the portrait should reflect haughtiness. However, the situation worsens with the output of a woman who looks like she stepped out of *a* 1970s television series, like *The Waltons* (Figure 5).

Fig. 4: Maria Bandeira at the Rio de Janeiro Botanical Garden. Source: Museu do Meio Ambiente/JBRJ, n.d., and photo cropped, enlarged, and colorized with AI by the author (2024). Source: Bediaga et al., 2016. Available at: https://doi.org/10.1590/S0104-59702016005000002. Accessed: 11/03/2024.

Fig. 5: Failed attempts to generate an AI portrait of Maria Bandeira at the age of 90, merging her with bryophytes. Source: Author, 2024.

After much processing, I arrived at a result that I approved (Figure 6), recovering, in this odyssey, a path that converges with the studies I have been doing on the mechanical eugenics of the gaze. Even so, the image did not reflect the haughtiness and smile that had so caught my attention in the analysis of his portrait in the field (Figure 4), demanding work of reconstructing texts to prepare the *prompts* that extended for another two months until I reached the final result (Figure 7).

Fig. 6: Fictional portrait of Maria Bandeira, made with AI at 90, in the Botanical Garden of Rio de Janeiro, merging with the bryophytes to which she dedicated so much. Source: Author, 2024.

Fig. 7: Fictional portrait of Maria Bandeira, made with AI at 90, in the Botanical Garden of Rio de Janeiro, merging with the bryophytes to which she dedicated so much. Source: Author, 2024.

6 Conclusion

As discussed in this article, the gaze goes beyond the field of vision and refers to our vision of the world. The potential of artificial intelligence to shape fields of visibility will not imply genocide or racial wars, as did the eugenics movements of the first half of the 20th century. However, it can establish new forms of invisibility and social exclusion, which impact the Global South through technological procedures that deepen racist dynamics. This technopolitical framework is combined with new processes of exclusion, with a strong ageist bias, exacerbating the erasure and social alienation of women, particularly older women. Suppose machinic eugenics refers to using technology or machines to implement or facilitate eugenic practices or policies. In that case, the machinic eugenics of the gaze refers to ways of seeing according to the standards established by artificial intelligence. For this reason, computer vision is a device (not just a tool) that can transform it into the hegemonic visual apparatus of our time.

Alternatives to improve computer vision models through data curation and improvements in machine learning processes will undoubtedly allow for specific problems to be solved, but not the pattern-based model of current AI systems, and therefore not their power dynamics and forms of distribution of the sensible. New questions, not answers, will come from counter-hegemonic structures rather than from adjustments to current models. These counter-hegemonic models refer to perspectives from the South, feminist and *queer studies*, standpoint and post-normal theory approaches, and different educational systems towards a "post-machine learning" culture and practice, as defined by Dan McQuillan (2022, pp. 104–108). Such an agenda suggests different approaches to artificial intelligence beyond the anthropocentric "man-machine" opposition and its prerogatives based on conceptions of pattern, deviation, or error. Following the irregular and unpredictable path, such an alternative agenda points to multiple ways of seeing and making worlds, taking what is outside the norm not as its model but as its starting point.

References

Agamben, G. (2009). *O que é contemporâneo? E outros ensaios* (V.N. Honesko, Trans.). Argos.

Amidon, K. S. (2008). Sex on the brain: The rise and fall of German sexual science. *Endeavor*, 32(2), 64–69. https://doi.org/10.1016/j.endeavour.2008.04.004

Azoulay, A. A. (2019). *Potential History: Unlearning Imperialism*. Verso Books.

Baratto, LC (2022). A Farmacognosia e o estudo das plantas medicinais no Brasil. In L. C. Baratto (Ed.), *A Farmacognosia no Brasil: Memórias da Sociedade Brasileira de Farmacognosia* (p. 17–35). Author's Ed.

Bediaga, B., & Filgueiras, T. S. (2016). Maria Bandeira: A pioneering botanist at the Rio de Janeiro Botanical Garden. *História, Ciências, Saúde-Manguinhos, 23*, 799–822. https://doi.org/10.1590/S0104-59702016005000002

Beiguelman, B. (1997). Genética, Ética e Estado: (Genetics, Ethics, and State). *Brazilian Journal of Genetics*, 20 (3). https://doi.org/10.1590/S0100-84551997000300027

Beiguelman, G. (2023). Galton Reloaded: Computer Vision and Machinic Eugenics. In G. Beiguelman, M. Devries, W. Soon, & M. Tyżlik-Carver (Eds.), *Boundary Images* (pp. 103–138). University of Minnesota Press.

Bridle, J. (2023). *Maneiras de ser: Animais, plantas, máquinas: a busca por uma inteligência planetária*. (D. Galera, Trans.). However.

Buolamwini, J. A. (2017). *Gender Shades: Intersectional Phenotypic and Demographic Evaluation of Face Datasets and Gender Classifiers* [Master of Science, Massachusetts Institute of Technology]. https://dspace.mit.edu/bitstream/handle/1721.1/114068/1026503582-MIT.pdf

Butler, R. N. (1969). Age-Ism: Another Form of Bigotry. *The Gerontologist,* 9(4_Part_1), 243–246. https://doi.org/10.1093/geront/9.4_Part_1.243

Castro, E. de. (2018). *Metafísicas canibais: Elementos para uma antropologia pós-estrutural*. Ubu Editora.

Chaderjian, D. (2022, May 5). *Artificial and Unreal: The Ethics of Beautification Technology for Images and Social Media*. Viterbi Conversations in Ethics. https://vce.usc.edu/volume-6-issue-1/artificial-and-unreal-the-ethics-of-beautification-technology-for-images-and-social-media/

Couldry, N., & Mejias, U.A. (2019). *The Costs of Connection: How Data Is Colonizing Human Life and Appropriating It for Capitalism*. Stanford University Press.

Crawford, K., & Paglen, T. (2019, September 19). *Excavating AI*. https://excavating.ai

Delumeau, J. (1989). *História do Medo no Ocidente*. (M. L. Machado, Trans.). Companhia das Letras.

Dias, T. (2024). O chão de fábrica da IA. *Intercept Brasil*. https://www.intercept.com.br/especiais/chao-fabrica-inteligencia-artificial/

EPIC - Electronic Privacy Information Center (2019). *In re HireVue*. https://epic.org/documents/in-re-hirevue/

Esteban, E. G. (2021). Gerontophobia. In J. Pizzi (Ed.), *Glosario de Patologías Sociales* . UFPel Editora.

Fischer, G. (2019). “Where are the Botocudos?” Anthropological displays and the entanglements of staring, 1882-1883. *História, Ciências, Saúde-Manguinhos,* pp. 26, 969–992. http://www.scielo.br/j/hcsm/a/8kdHgvv9cDxSnHMzm7SrXXn/?lang=en

Foster, H. (Ed.). (1998). *Vision and Visuality: Discussions in Contemporary Culture #2: 02*. New Press.

Foucault, M. (1999). *Vigiar e punir: Nascimento da prisão* (V. Ramalhete, Trans.; 20th ed.). Voices.

Foucault, M. (2008). *O Nascimento da biopolítica* (E. Brandão, Trans.). Martins Fontes.

Galton, F. (1879). Composite Portraits. *Journal of the Anthropological Institute, pp.* 8, 132–144. https://galton.org/essays/1870-1879/galton-1879-jaigi-composite-portraits.pdf

Galton, F. (2001). *Inquiries into Human Faculty and its Developments*. galton.org.

Gehl, R. W., Moyer-Horner, L., & Yeo, S. K. (2017). Training Computers to See Internet Pornography: Gender and Sexual Discrimination in Computer Vision Science. *Television & New Media*, 18(6), 529–547. https://doi.org/10.1177/1527476416680453

Grohmann, R., Pereira, G., Guerra, A., Abilio, L. C., Moreschi, B., & Jurno, A. (2022). Platform scams: Brazilian workers' experiences of dishonest and uncertain algorithmic management. *New Media & Society*, 24(7), 1611–1631. https://doi.org/10.1177/14614448221099225

Haraway, D. J. (1991). *Simians, Cyborgs, and Women: The Reinvention of Nature*. Routledge.

Haraway, D. J. (2016). *Staying with the Trouble: Making Kin in the Chthulucene*. Duke University Press.

Harwell, D. (2019, November 6). A face-scanning algorithm increasingly decides whether you deserve the job. *Washington Post*. https://www.washingtonpost.com/technology/2019/10/22/ai-hiring-face-scanning-algorithm-increasingly-decides-whether-you-deserve-job/

Karras, T., Aittala, M., Laine, S., Härkönen, E., Hellsten, J., Lehtinen, J., & Aila, T. (2021). *Alias-Free Generative Adversarial Networks* (arXiv:2106.12423). https://doi.org/10.48550/arXiv.2106.12423

Lee, N., Bang, Y., Lovenia, H., Cahyawijaya, S., Dai, W., & Fung, P. (2023). *Survey of Social Bias in Vision-Language Models* (arXiv:2309.14381). http://arxiv.org/abs/2309.14381

Lee-Morrison, L. (2019). *Portraits of Automated Facial Recognition: On Machinic Ways of Seeing the Face*. https://doi.org/10.14361/9783839448465

Luz, P. (2015). *Psychonautical Letter*. Dantes Ed.

Machado, M., & Huber, S. (Orgs.). (2010). *(T)races of Louis Agassiz: Photography, body and science, yesterday and today and today*. Capacete Entretenimentos.

McQuillan, D. (2022). Resisting AI: An Anti-fascist Approach to Artificial Intelligence. In *Resisting AI*. Bristol University Press. https://bristoluniversitypressdigital.com/display/book/9781529213522/9781529213522.xml

Moreschi, B., Pereira, G., Cozman, FG, & Tiago, GA (2020). The Brazilian workers in Amazon Mechanical Turk: Dreams and realities of ghost workers. *Contracampo, 39* (1), 1–21. https://repositorio.usp.br/item/003028584

National Human Genome Research Institute. (2021, November 30). *Eugenics: Its Origin and Development* (1883 - Present). https://www.genome.gov/about-genomics/educational-resources/timelines/eugenics

Noble, S. U. (2018). *Algorithms of Oppression: How Search Engines Reinforce Racism*. NYU Press.

Owens, K., & Walker, A. (2020). Those designing healthcare algorithms must become actively anti-racist. *Nature Medicine, 26* (9), Article 9. https://doi.org/10.1038/s41591-020-1020-3

Pasquinelli, M., & Joler, V. (2020, May 1). *The Nooscope Manifested: Artificial Intelligence as Instrument of Knowledge Extractivism*. KIM research group (Karlsruhe University of Arts and Design) and Share Lab (Novi Sad). https://nooscope.ai

Pratt, A. (1857). *Poisonous, noxious, and suspected plants of our fields and woods*. Society for Promoting Christian Knowledge. https://www.biodiversitylibrary.org/item/258098

Rancière, J. (2004). *The Politics of Aesthetics* (G. Rockhill, Trans). Continuum.

Rowland, M. (2022). Online Visual Self-Presentation: Augmented Reality Face Filters, Selfie-Editing Behaviors, and Body Image Disorder. *Journal of Research in Gender Studies*, 12(1), 99–114. https://doi.org/10.22381/JRGS12120227

Santaella, L. (2023). *A inteligência artificial é inteligente?*. Edições 70.

Sekula, A. (1986). The Body and the Archive. *October,* pp. 39, 3–64. https://doi.org/10.2307/778312

Silva, T. da. (2020). Visão Computacional e Racismo Algorítmico: Branquitude e Opacidade no Aprendizado de Máquina. *Revista da Associação Brasileira de Pesquisadores/as Negros/as (ABPN), 12*(31). https://abpnrevista. org. br/index.php/site/article/view/744

Souza, V. de. (2024). O Brasil da mitologia racial: Eugenia, racismo e utopias nacionais no Modernismo brasileiro dos anos 1920. *História (São Paulo), 43*. https://doi.org/10.1590/1980-4369e20230007

Souza, L. de M. e. (1993). *Inferno Atlântico: Demonologia e Colonização* (séculos XVI-XVIII). Companhia das Letras.

Steed, R., & Caliskan, A. (2021). Image Representations Learned with Unsupervised Pre-Training Contain Human-like Biases. P*roceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, 701–713. https://doi.org/10.1145/3442188.3445932

Stern, A. M. (2011, October). *United States • Around the World • Eugenics Archive*. https://www.eugenicsarchive.ca/around-the-world?id=51bbb96b97b8940a54000002

Stypinska, J. (2023). AI ageism: A critical roadmap for studying age discrimination and exclusion in digitalized societies. *AI & SOCIETY, 38* (2), 665–677. https://doi.org/10.1007/s00146-022-01553-5

Szeliski, R. (2011). *Computer Vision*. Springer London. https://doi.org/10.1007/978-1-84882-935-0

Tsing, A. (2022). *O cogumelo no fim do mundo: Sobre a possibilidade de vida nas ruínas do capitalismo* (Barreto, JM, & Rafael, Y, Trans.). N-1 Edições.

Turda, M. (2022). Legacies of eugenics: Confronting the past, forging a future. *Ethnic and Racial Studies, 45* (13), 2470–2477. https://doi.org/10.1080/01419870.2022.2095222

Wegenstein, B. (2012). *The Cosmetic Gaze: Body Modification and the Construction of Beauty*. MIT Press.

Wegner, R., & Souza, V. S. de. (2013). Eugenia “negativa”, psiquiatria e catolicismo: Embates em torno da esterilização eugênica no Brasil. *História, Ciências, Saúde-Manguinhos, 20*, 263 –288. https://www.history.org/history ... /doi.org/10.1590/S0104-59702013005000001

Wilson, R. A. (2017). *The Eugenic Mind Project*. The MIT Press.

Zou, J., & Schiebinger, L. (2018). AI can be sexist and racist – It's time to make it fair. *Nature, 559* (7714), 324–326. https://doi.org/10.1038/d41586-018-05707-8