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## **Images of Resistance: Thinking about Computer Vision AI in Surveillance Capitalism through Images of Marielle Franco**

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## Images of Resistance

### Thinking about Computer Vision AI in Surveillance Capitalism through Images of Marielle Franco

*Vinicius Ariel Arruda dos Santos, Bruno Moreschi, Amanda Jurno, Didiana Prata, Monique Lemos, Lucas Nunes Sequeira*

#### Abstract

*This article examines the ambivalent dynamics of activism in social media and online platforms. Made up of Brazilian researchers from areas such as Communication, Visual Arts and Design, Anthropology, Computer Science and Engineering, our group analysed 213,083 images shared on Instagram that are part of the hashtag #MariellePresente, an online political manifestation that arose in response to the assassination of Brazilian councilwoman Marielle Franco in 2018, an unsolved case. After collecting images with a Python programming language script, we used two Computer Vision/Artificial Intelligence tools to read them (Google Cloud Vision and YOLO Darknet). The results show the capitalistic logics inscribed into these technologies and also shed light on the role played by both online activism and data analysis tools. Thus, the consequences of the shift of political movements online became apparent: by helping activism to find its audience, online platforms simultaneously subject its cause to demands of 21st century digital capitalism (Zuboff 2019; Srnicek 2017; Bruno 2013; Cray 2013; Beiguelman 2020).*

#### Keywords

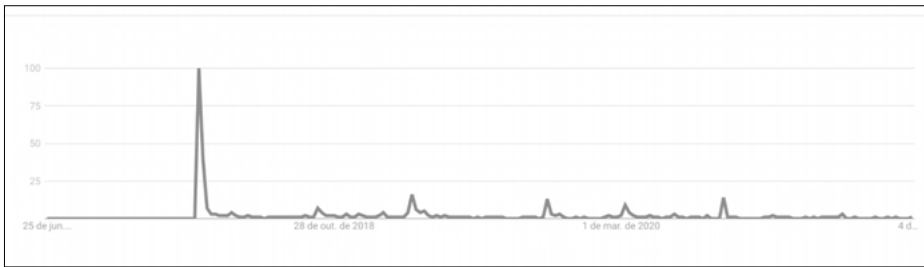
*Marielle Franco; Computer Vision; Activism; Social Media*

## 1. Who Killed Marielle? And Who Ordered the Killing?

Marielle Franco, a Brazilian black lesbian feminist, a member of the City of Rio de Janeiro Council, was murdered during a military intervention in Rio de Janeiro in 2018. She was a human rights activist that focused on political minorities, namely the LGBTQIA+ community and the black population in Rio. Her political battles led her to take the role of rapporteur for an inquiry on military abuse just one month before her assassination. The councilwoman, a member of the opposition left-wing party Socialism and Liberty (PSOL), was sitting inside a car when she and her chauffeur, Anderson Gomes, were fatally wounded by gunshots.

The subsequent protests were massive (BBC 2018), raising the question: “Who killed Marielle?”. Indignation mounted on social media (e.g., Facebook, Instagram and Twitter), as images of or about Marielle were posted with the hashtag #MariellePresente (Marielle [is] present). In just a few weeks, her history, her murder and the consequent repercussions turned Marielle into a symbol, as mentions of her name peaked (Fig. 1), reaching 567,000 posts on Twitter 19 hours after the crime (Bastos/Guerra 2018: 2). Investigations made little progress, leading to an uptick in the outrage among those sympathetic to the causes she had supported. Furthermore, the lies of suspects (Corsini 2021), police officers’ interference (BBC 2019), and loss of crucial evidence (Franco 2021) created a sense of impunity that persists to this day. New facts linking the assassination to supporters of the current Brazilian president, Jair Bolsonaro (BBC Brazil 2020), raised the suspicion that the delay was a deliberate obstruction of justice, which prompted a change in the rallying call of the protests to: “Who *ordered* the killing of Marielle?”.

*Fig. 1: Distribution of search requests for “Marielle Franco” on Google – reaching its peak in March 2018. Credits: Google Trends 2021.*



This ongoing research<sup>1</sup> brings together academics from Communication, Visual Arts and Design, Anthropology, Computer Science and Engineering – members of the Group on Artificial Intelligence and Art/C4AI at the University of São Paulo. We tested how Computer Vision (CV) tools treated images posted on Instagram with the hashtag ‘#MariellePresente’, to find out whether Artificial Intelligence (AI) tends to read images according to the logic of consumption and captures the singularities of activist images when they flow through the internet. In this paper,

1 This research is related to the Scientific Initiation of Vinicius Ariel, Computer Engineering undergraduate, with Bruno Moreschi’s supervision at the Faculty of Architecture and Urbanism of the University of São Paulo, with the support of the PIBIC scholarship CNPq, in the years 2020/2021. It also involved Lucas Nunes Sequeira’s PIBIC/CNPq research scholarship, under the supervision of Fabio Gagliardi Cozman. The project began with the investigations carried out by Didiana Prata in her PhD at the same Faculty, whereby she studies the aesthetic of dissent images in social networks, in a visual cultural context.

we draw on the work of authors who study capitalism at the beginning of the 21st century (Bruno 2013; Crary 2013; Srnicek 2017; Zuboff 2019; Beiguelman 2020). We propose to analyse the results obtained with CV tools to better understand the underlying mechanisms that form part of the surveillance capitalism on the web. Thereby, this text adds to others on Marielle's presence on the internet, such as the investigation of image sharing associated with her (Goveia 2018), and a study on the polarization of the case (Ruback /Oliveira 2018).

## 2. The Images of Marielle

Back in 2018, the posts linked to the hashtag '#MariellePresente' aimed to inform local users of her murder, but soon achieved a national and international impact (Goveia 2018). Unlike other image sharing protests, though, this one continued on social media as the killers' impunity persisted, and the hashtag's meaning became broader. Soon, it started being used as a political demonstration – e.g., in favor of progressive flags –, on posts not related to Marielle, becoming a self-affirmation of being part of a broader online community (Fig. 2).

*Fig. 2: Photo posted by a person celebrating New Year's Eve linked with #MariellePresente.*

*Credits: Instagram user @danimartinsbarros.*



The images related to Marielle are part of a digital context characterised by the intense spread of media content – e.g., almost 20 billion images were shared on Instagram in the first half of 2021.<sup>2</sup> This overproduction of politically engaged

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2 "Internet Live Stats." July 25, 2021 (<https://www.internetlivestats.com/>).

images and street manifestations has led to them being termed “dissent images” by Didiana Prata (2020), since they mobilise specific activist groups to fight for their rights on social media through a fragmented visual narrative. These images travel fast and infiltrate informational flows in small formats, since they are “poor images”, as defined by Steyerl (2009: 7). She argues that they do not seem to be significant when analysed individually, but they manage to be influential when analysed together.

For the purposes of this work, we gathered two sets of images. The first one was originally part of the netart project “Calendário Dissidente”, which investigates the flow of dissent images on Instagram. From the over 300,000 images collected for the Calendário, 69.8 percent were labelled with “#MariellePresente”. From this set, we chose 83 images related to Marielle that had reached the threshold of 50,000 likes by August 2020, extracted using the Instaloader library (Graf/Koch-Kramer 2016) for the Python programming language. The second set consists of 213,000 images posted on Instagram from January 2019 to August 2020, using the same scraping method.

*Fig. 3, Fig. 4: On the left, the most liked Marielle related image on Instagram by the time of our analysis (January, 2019 to August, 2020); on the right, the image with the most total pairs on Google Cloud Vision. Credits: @brunamarquezzine (Im.3), @hugogloss (Fig. 4).*



Next, we observed how these images were understood by two pre-trained CV tools – Google Cloud Vision and YOLO. Google Cloud Vision<sup>3</sup> (GCV) is a commercial CV tool focused on business analytics; and YOLO Darknet is a non-profit CV tool (Redmon/Farhadi 2018). Those programs were chosen for this initial study due to their simplified usage, having robust pre-trained models, and for being open source. Although methodologically, it would be more appropriate to report on the operability of computer vision algorithms used by online platforms, these are not

3 “Google Cloud Vision.” (<https://cloud.google.com/vision/>).

available for public use. Therefore, we focus on testing GCV's Label Detection and Internet Detection tools, which are both image labelling methods. YOLO conducts a simpler analysis, as a result of being trained with Microsoft COCO (Lin et. al 2014), an image dataset compiled with the intent of recognizing only 91 object types. Based on these CV analyses, we discuss ambivalences that activism faces within the capitalist framework of social media. We finish this initial research paper with an open conclusion on how images of Marielle managed to break through the exclusion of black people in digital contexts.

### 3. Marielle and Digital Activism's Paradox

As Crawford argues, "classification is an act of power" (2021: 127), since naming, categorising and organising information has always had an intimate relationship with the narratives these powers construct. AI classifications are subjective, as they dictate which categories are attached to a given label, besides the labels that are available to begin with. The problem with all classifications is that they become invisible as they get embedded in infrastructures and in the routine. Therefore, Crawford points out that "we can easily forget that the classifications that are casually chosen to shape a technical system can play a dynamic role in shaping the social and material world" (ibid.: 128). In this research, we start from the premise that AI uses classification to encode power and that it is not a bug – as the AI industry has traditionally claimed – but a part of the mechanisms of knowledge production. Because every dataset and training machine contains a worldview, "the result is a statistical ouroboros: a self-reinforcing discrimination machine that amplifies social inequalities under the guise of technical neutrality" (ibid.: 131).

The pre-trained GCV's Label Detection tool analysis works by reading an image as stand-alone data and labelling it with predefined classifications that Google AI understands as the best fit to what the image shows. By running this tool over our two image sets, we confirmed a consumerist bias: the tendency to classify content as objects of consumption observed in previous studies (Moreschi/Pereira 2020) also applied to our group of images – almost regardless of what they showed. We identified eleven different labels related to "clothing" or "fashion" in general (Fig. 5). Also, we found out that images showing one person – positioned in the middle – were labelled as 'posing' (Fig. 6). Even images that do not depict people fell under this capitalist logic: some of those that include text were labelled as "Advertising" (Fig. 7). We noted that the "mistakes" made by the AI are usually attempts to grasp the context in these images, for example when it implied that Marielle is a singer (Fig. 8 and Fig. 9), and that Carlos Bolsonaro (politician and son of the current president of Brazil, Jair Bolsonaro) is a businessperson (Fig. 10). Besides, Google tended to brand black people as part of entertainment and/or sports contexts, confirming stereotypes already pointed out in previous research studies, both in the specific field of algorithmic studies (Silva 2020: 438) and in

other areas such as the History of Art and artistic images (Benedita/Moreschi 2017). This imprecision in defining context may be the reason why Google itself avoids relying too much on ‘on-image-information’ for search queries<sup>7</sup>.

Despite also detecting bags and other fashion accessories (Fig. 12), YOLO tends to be less ‘subjective’ in its labelling because its labels are only object-related. Although bias is also present in the list of objects it is trained to recognise, it tends to be more assertive than GCV. As we discuss below, these results say little about Marielle, let alone about the online movement that emerged after her death. Instead, they reveal how these online images are read and inserted into a capitalism-centred context (Mueller 2021).

*Fig. 5: Labelling focused on fashion and physical appearance (‘Beauty’, ‘Fashion model’, ‘Dress’, ‘Street fashion’ and ‘Fashion design’). The favela context was not recognised by Google AI (GCV). Credits: @adrianalima.*



*Fig. 6: Other people are also read from a consumer perspective. The ‘Black lives matter’ (in Portuguese) is not considered by GCV. Credits: @icaro.*



Fig. 7: The message disseminated by thousands of people and two important hashtags presented in the image are classified as 'Logo' and 'Brand' by GCV.



Fig. 8 and Fig. 9: GCV also often reads Marielle as someone who is singing, labelling images with 'Music Artist', 'Talent Show' and 'Performing Arts'. This did not happen so often with images of white people in a similar position. Credits: @fatimabernardes.

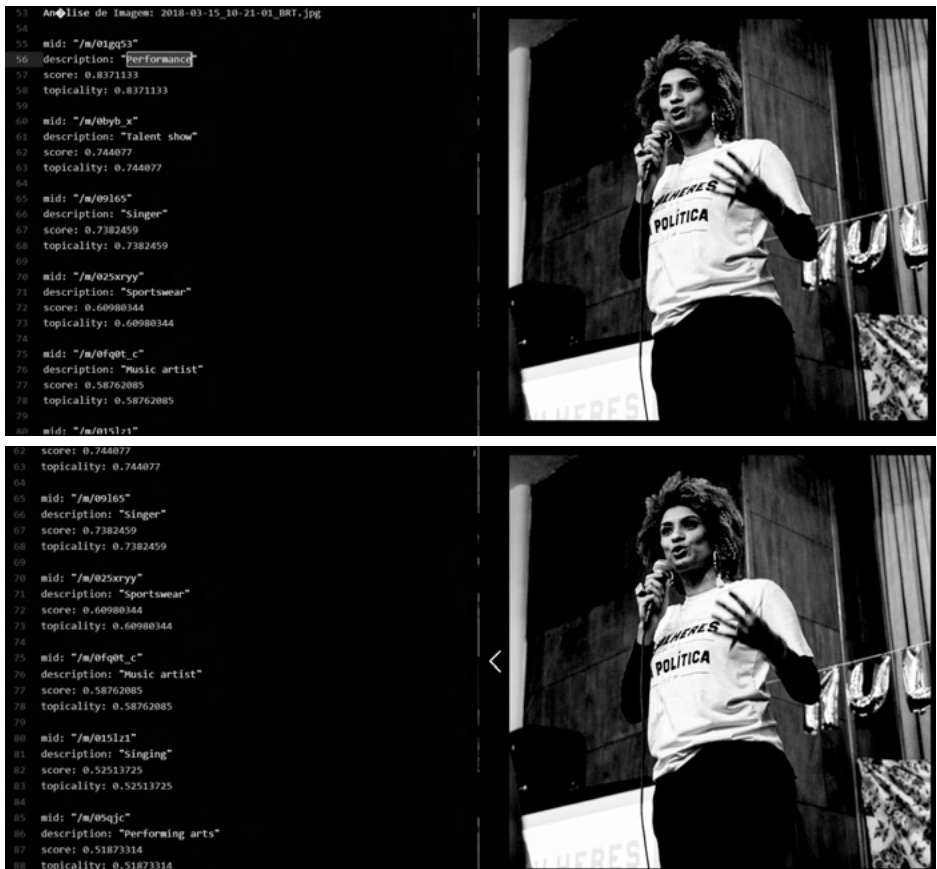


Fig. 10: The image's headline informs us that Carlos Bolsonaro (in the picture) is being investigated for his participation in Marielle's death. GCV reads it as 'Businessperson'. Credits: @midianinja.

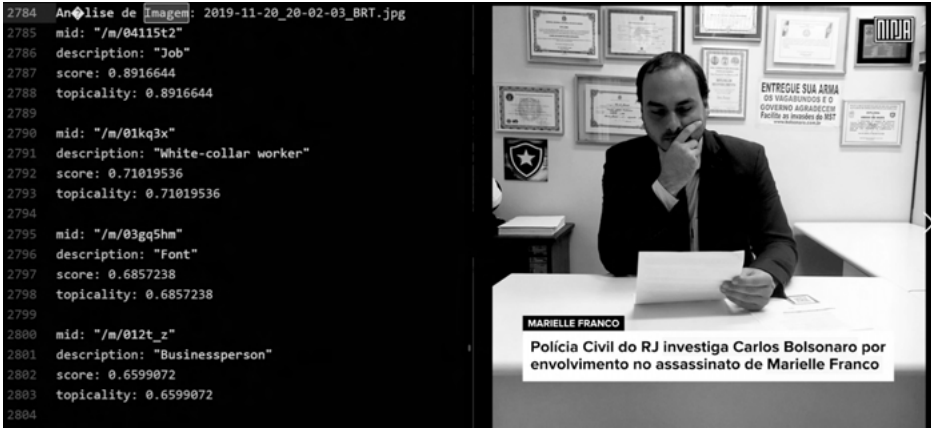
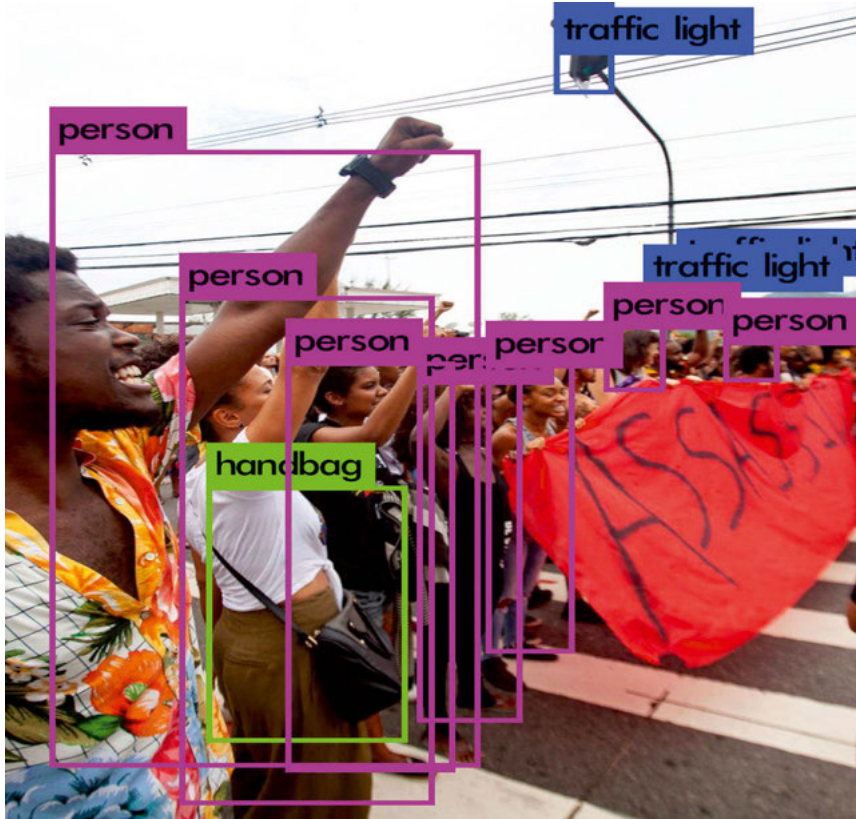


Fig. 11: The image of black people protesting at Marielle's death was labelled as 'Fun' and 'Smile' by Google's AI (GCV), softening the political content. Credits: @icaro.



Fig. 12: Unlike GCV, YOLO tends to be more direct in its labelling, even though it also reads fashion and consumer accessories. Credits: @icaro.

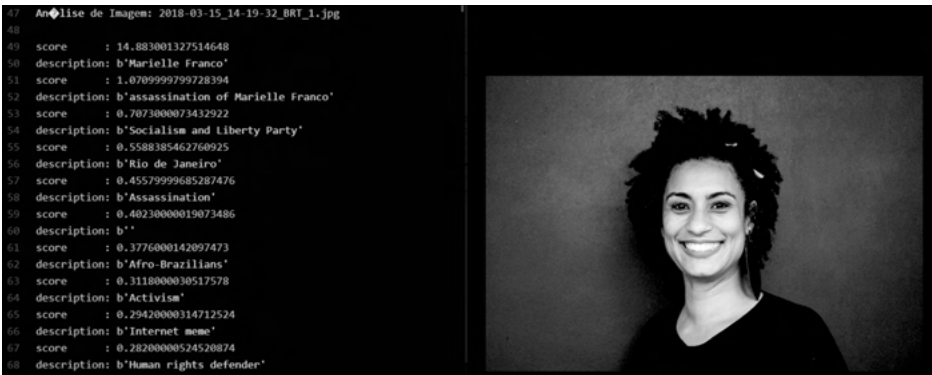


Another Google's CV tool, Internet Detection, also demonstrates how images tagged with "#MariellePresente" might circulate online, instead of just discussing how the "raw" information of the image might be understood. By searching these images and information about the web pages they appear on, this tool is able to identify Marielle individually as herself (Fig. 13), and also to grasp the context that is not present in the images, such as her political party (Fig. 14) or nationality (Fig. 15). Some of the classification labels would even suggest a glimpse of opinion in defence of Marielle, probably extracted from the web: the "Brazilian Police Militias" label (Fig. 16) implies the participation of the police in the crime; and "*Quem matou? Quem Mandou Matar?*" (Who killed [her]? Who ordered the killing?) (Fig. 17), one of the few that were shown in Portuguese, reinforces that the assassins are yet to be found. Summarising, the outcomes suggest that tools like GCV are able to identify the "community" that an image belongs to by following its track on the web (and other metadata available) rather than by looking at its contents – a relationship more visible when iterating the tool through images that have contextual meaning, as is the case with activists' images.

Fig. 13: Marielle's image by GCV's Internet Detection, recognizing her and the context surrounding her death. Credits: @caiapitanga.



Fig. 14: One of the images of Marielle tagged with the name of her party. Results in Portuguese are rare: we are dealing with a tool that reads the world from the hegemonic English language, even when analysing images unrelated to North American contexts. Credits: @criolomc.



One of our main intentions in surveying CV tools is to go beyond discussing the specific problematics they create and replicate, and to understand these results in the broader context of contemporary surveillance capitalism. In her book on surveillance capitalism, Zuboff (2019: 97) states how technology companies gather data from their users' behaviour and sell advertisers the opportunity to use targeted ads on consumers most susceptible to carrying out a purchase. As a result, companies now compete for all possible aspects of daily life connected – and yet to be connected – to the internet, and also build online platforms that encourage interaction between users, advertisers and service providers (Srnicsek 2019: 31). Keeping users engaged in their services and preserving these digital

communities, such as the one created by “#MariellePresente”, the platforms need to understand the users’ affinities, including political views. Therefore, context-sensitive tools capable of tracking images are a powerful resource for feeding communities content that they are more likely to interact with (Oremus 2016), thus generating data in the form of behaviour surplus (Zuboff 2019: 430), while also creating a sense of personal belonging (Gwendolyn 2013: 403).

*Fig. 15: GCV labelled an image of Marielle with ‘Afro-Brazilians’. This is one of the few times Google AI offered a result in Portuguese: ‘favela’.*



*Fig. 16: Image of Rio's 2019 Carnival, when Marielle's widow, Mônica Benício, used the scene to protest at Marielle's death. It was tagged by GCV as 'Brazilian police militias' – implying some coherent complaints of police interference. Credits: @midianinja.*

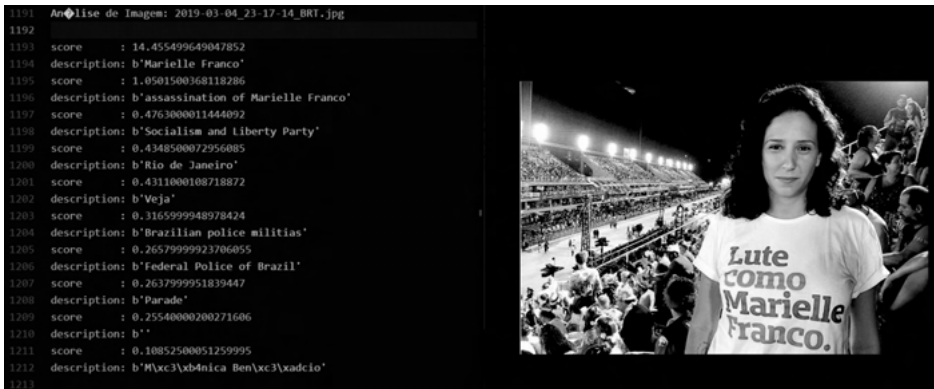


Fig. 17: Even though results in Portuguese are rare in GCV, the two questions most associated with the protests break this linguistic exclusion and appear in their native language: ‘Quem matou? Quem Mandou Matar?’ Credits: @guilhermeboulos.oficial.



The way in which algorithms overseeing user interactions operate, especially algorithms of public relevance (Gillespie 2014), is fundamental to understanding why activism was able to easily migrate online. Such tools ensure that users are shown content with which they would likely interact. This logic fosters engagement otherwise not possible in other media. Activism such as that related to Marielle’s death and Black Lives Matter merged with social media in such a way that it may no longer be possible to think about activism without online platforms. In this sense, activism is now inextricably dependent on the platforms’ services, as no alternatives provide the same impact (Srnicsek 2019: 70).

This merging may have bitter and ambivalent consequences for protesting. The same online environment that allows militancy to flourish also sets the stage for anti-democratic movements, while profiting from both of them. This suggests that it is not the image content, but rather the “more profitable” metadata, like tags and interactions, that count when determining the spread of an image. Also, as the main source of income for online platforms flows through the abundance of behaviour surplus gathered from a large number of users, there is no rush for those platforms to suppress anti-democratic activities and risk losing groups of users (Zuboff 2019: 476). Therefore, although online activism has seen increased mobilisation to its causes, their very existence online keeps its causes from reaching beyond the borders of their communities, increasing polarisation. Moreover, algorithms of public relevance are not playing the role of mere observers, trying to predict the affinities of each group. Those algorithms control what users see and consume, helping communities grow into niches evermore fitting to their predictions (Brito/Jurno 2020; Gillespie 2014). Consequently, online activism is not only curtailed in a surveillance structure, but becomes such a structure itself, where bodies watch over each other (Bruno 2013: 7).

As we celebrate an increasingly interconnected world dominated by a cute and seemingly harmless capitalism (Beiguelman, 2020), a “coup from above” (Zuboff 2019: 479) from the big tech companies expropriates human rights. Our findings related to images connected to Marielle, particularly those targeting specific audiences, illustrates how this ongoing expropriation is reinforced and poses a risk to democracy: the digital dream has morphed into a violent commercial project, to which online activism unwittingly contributes by simply generating traffic and online interaction. For Zuboff (2019: 480), this kind of “nightmare” characterises surveillance capitalism, but it is important to highlight that other scholars on contemporary capitalism corroborate this finding – sometimes using different terms. For example, Crary’s (2013) considerations on ‘late capitalism’, where the human being must work uninterruptedly, relate directly to the idea of the loss of the right to sanctuary (Zuboff 2019: 449), as the human need for an inviolable space of refuge.

#### 4. Other Thoughts: Black Women’s Invisibilities

Empirical investigations with images for this article indicate issues related to CV/AI and how it behaves when faced with specific images about Marielle Franco, but not only that. After a year dealing with images of a black woman in a digital surveillance capitalism context, necropolitics also seemed evident to us. This is an open-ended conclusion, not only because Marielle’s images continue to circulate on social media and be levelled by commercial AIs, but also because the image of a black woman only managed to break the invisibility imposed on it because she was murdered and became a symbol.

Flauzina and Freitas state that the direct consequence of structural racism is the politicisation of black people suffering through “the construction of an imaginary in which the image of black people as beings fundamentally associated with the reproduction of violence operates in a coordinated manner, but is excluded from the right to claim the suffering derived from it” (2017: 135, our translation). In Marielle’s case, the AI labelling promotes an “update” of necropolitics by tempering her death into a product of capitalism, reflecting how annotations (including those offered by CVs) and informational records reproduce power (Silva 2020; Crawford 2021). The selective character of social indignation in the face of violence, allied to racism, places the victimisation and reproduction of physical or symbolic violence within the capitalistic, normative technocratic logic created mostly by white people (Gruman 2020). Therefore, it is possible to understand how Marielle Franco’s death also serves as a symbol of this struggle against the naturalisation of the extermination and disposal of black bodies, now increasingly powered by AI.

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