

What about the ethics of applying artificial intelligence to bodies?

ADRIEN JEANRENAUD, University of Geneva, Switzerland



Fig. 1. COCO Key Points Detection Task, 2020.

Images convey, through representations of bodies, in the press, cinema and art, one or more gender imaginaries while acting as vectors in the process of globalization. The recurrence or similarity of some of these images reveals the diffusion or persistence of the representations that correspond to them and their influence on our conception of the world; through the visibility of certain bodies, certain postures, to the detriment of others, notions of gender, sexuality and alterity are modelled, which impregnate our memory, effects, and action.

CCS Concepts: • **Computing methodologies** → **Artificial intelligence**; **Philosophical/theoretical foundations of artificial intelligence**.

Additional Key Words and Phrases: digital humanities, ethics, artificial intelligence, body

1 INTRODUCTION

This project will attempt to bring to light the recurring visual motifs in the representations of the body,¹ their impact in the construction of the imaginary and their place in the process of globalization through images, from the end of the Second World War to the democratization of the Internet, on a worldwide scale. The place of the body in the second half of the twentieth century has been studied from the angle of history [3, 14, 15], sociology [2, 8], philosophy [1], psychology [7, 12], and even from the legislative point of view [9]. In fact, the body has become an object of study to think societies, their changes and their norms, but the absence of a global study prevents a clear idea of the representations of the body on a worldwide scale, and the taking into account of phenomena of cultural variety, resistances to the Western injunctions, or an unsuspected creativity. The body is an issue in the study of globalization that this project proposes to study on a worldwide scale during the second 20th century.

¹This project takes part to the SNF Visual Conatgions (<https://www.unige.ch/visualcontagions/>) headed by Béatrice Joyeux-Prunel at the University of Geneva

In this perspective, the place of the body is central in our research. The body is multiple and complex, and the application of digital tools in order to update its presence in an image as well as its specificities raises questions that ethical considerations allow to put in perspective. Artificial intelligence on bodies applies in this work, at this stage, on two distinct levels: the constitution of the relevant corpus and the application of digital tools in an intelligent way. The stake is the operationalization of our research questions by cancelling as well as possible the biases that these two parts - constitution of the corpus and application of digital tools - generate.

2 SOURCES

It is obvious that the way our database is constructed will influence the results. To minimize the negative impacts of the construction of the corpus on our results, ethical considerations are useful. We can first question its corpus according to criteria of representativeness, transparency and inclusiveness. The representativeness mainly concerns the lack of extra-western sources due to inequalities in equipment and access to digital technology.² Despite the cross-referencing of several sources, the data does not ensure a full representation of reality. The transparency of the nature of the sources and their crossing is also a central point: where do they come from? What do they represent? In fact, in order to make a critical, ethical and external judgement on a corpus, transparency is necessary - as this article demonstrates about the crossing of sensitive data [13]. Finally, the image and the bodies contained in it are sensitive data whose inclusiveness is a known problem [4]. The lack of gender or ethnic diversity, as well as classification and its issues, perpetuates a vicious circle of discrimination [5], whose biases can be moderated by the geographical diversity of sources.

From this perspective, particular attention must be paid to the diversity of sources; illustrated magazines and movie posters are more readily available in European, North American, and even Oceanic collections. The commissioning of digitizations and the development of partnerships in under-represented regions is a possible strategy to remedy the lack of exclusivity and representativeness. In addition, we are committed to transparency by making our corpus visible, its constitution, its limits and its biases.

3 DIGITAL TOOLS

The major ethical problem remains the way in which bodies are considered in images by digital tools.

3.1 Possibilités

Locating bodies and classifying their postures is essential for our analysis - a second problematic axis in which the computational approach, depending on the way it is applied, can induce more or less important biases. There are different ways of updating, surrounding and describing bodies using digital tools. Object detection defines a person, a body as one class among others.³ In addition to being standardized in the set of object classes, the body is normalized. And this normalisation refers back to the problem of inclusiveness noted earlier in the sources and their biases, whereas this is precisely what we want to circumvent. Panoptic segmentation refers to a global and unified vision of segmentation.⁴ It is still a question of a relation to the norm, this time of the norm of the representations containing bodies as well as of the standardization by its labeling [10]. Despite their labeling, the place of the body in the space of the image when it is the only parameter, provides

²We Are Social's report highlights this problem : <https://wearesocial.com/us/blog/2021/01/digital-2021-the-latest-insights-into-the-state-of-digital/>, accessed December 9, 2021.

³<https://cocodataset.org/#detection-2020>, accessed December 9, 2021.

⁴<https://cocodataset.org/#panoptic-2020>, accessed December 9, 2021.

useful information on the composition and place of bodies in the images.⁵ As for the detection of pose density,⁶ although it integrates information about the posture, folds and movements of bodies, it relies on a method similar to object detection - in fact, we fall back on source bias, inclusiveness. On the other hand, gender and ethnicity are also a way of characterizing bodies,⁷ the biases of which have been discussed above. The detection of body attributes, such as hands,⁸ allows us to notify the presence of a body in the image, but does not give more information about the rest of the body.

Of these techniques, which we have been able to implement, we must be attentive to their limits and their contributions with regard to our problems. From this point of view, questioning the gender and the norm of bodies in representations requires a particular attention to the algorithms which update these characteristics, the way they are implemented and the biases they perpetuate.

3.2 Choices

Finally, in order to understand the circulation of body patterns, their recurrences and the stakes in the creation of imaginaries, in the most relevant way possible, it is necessary to use a tool that bypasses the biases linked to normalisation, standardisation, gender and ethnicity. In this perspective, the detection of key points,⁹ the description of poses [11] using points and segments, allows us to consider the body first as a skeleton, a form that describes a movement in space.

This method was used by Leonardo Impett during his study [?] of Aby Warburg's Atlas Mnemosyne [16]. Warburg was trying to account for the recurrence of bodily patterns in works of art through ages and spaces. Thus, instead of considering the body as a standard, normed and immobile object, Warburg postulated the existence of formulas of pathos, *Pathosformeln* whose circulation by the ages and the spaces he identified.¹⁰ The body, in this perspective, is considered as a force, a lively emotion, a movement in space. It is no longer a question of defining the body by this or that gender, by this or that ethnic group, nor by their socio-cultural attachment, but by the movement that it creates, the space that it deploys in the image. The method, which Impett has shown to be technically feasible and historically interesting, integrates ethical considerations into the problems raised by the project - apart from the creation of norms, standards, and the construction of genres and ethnicities. From this point of view, the technique allowing it, it is necessary to apply this method and its tools to our corpus.

4 CONCLUSION

While the questions - representativeness, transparency, inclusiveness - linked to historical events, to local and global perspectives are more related to the sources and to the constitution of a corpus, the questions on the social construction of gender and ethnicity, the updating of an imaginary and the creation of norms and standards go through the tools used. Updating these questions and their foundations in the human and social sciences with regard to digital tools is an approach that requires the contribution of ethical considerations.

In our case, questioning the limits, biases and contributions of digital technology allows us to find solutions to remedy them: between an effort to add under-represented sources and the use of the most neutral tools possible to describe the bodies.

⁵In this case, it is interesting to go back to the previous step of the algorithm, i.e. the segmentation of the objects: <https://cocodataset.org/#stuff-2019>, accessed on 9 December 2021.

⁶<https://cocodataset.org/#densepose-2020>, accessed December 9, 2021.

⁷<https://github.com/diovisgood/agender>, accessed December 9, 2021.

⁸<https://github.com/SupreethN/Hand-CNN>, accessed December 9, 2021.

⁹<https://cocodataset.org/#keypoints-2020>, accessed December 9, 2021.

¹⁰To go further: [6]

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