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Vera Icona: Installation and performance

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Abstract

The installation-performance *Vera Icona* offers a reflection on the relationship between face and image in contemporary society. It is inspired by the legend of the "Vera Icona", an « Icon Made Without Hands » that opens the political and philosophical history of Western images, from the icon to contemporary video. The imprint of the Christ's face left on the veil stretched by Veronica on the *Via Crucis* in Jerusalem suggests looking at a print that is similar to photography, long before it was actually "invented". In Jerusalem nowadays, the installation-performance features a metaphor for its legend, in the new images not made by a Human hand, produced by the thousands of surveillance cameras of the city. Thanks to artificial intelligence, the installation puts in abyme the faces of the watched and those of watchers. It invites the viewer to consider her/himself at the center of her/his universe, far from established norms and control societies. A performance of actors and circus artists come along with this installation.

Keywords: Video surveillance, face, image ecology, image-symptom.

1. Introduction

The installation-performance *Vera Icona* constitutes one component of a broader reflection on the images produced without direct human intervention, by drawing a thread between the legend of "Vera Icona" which would be one of the first *Acheiropoieta*, that is to say "images made without hands" [1], until the current ubiquity of images. Regardless of the veracity of the legend, this "imprint image" opens the political and philosophical history of the face representations, which have long been sacred [2] or bourgeois, as a political instrument, from the icon to contemporary video.

This reflection began in 2017 during the artist's stay in Jerusalem, in the footsteps of "Vera Icona". Whereas nothing remains in the streets on the site of the legend, she discovers a special soundscape and the omnipresence of video surveillance cameras.

Today, considering the proliferation of images in our daily lives and their use for scientific, artistic but also political purposes, it is necessary to reflect on the image. *Vera Icona* sets out to explore this territory of "image-meaning" according to two paradigms: the ecology (the context) of the production of images and the image as a symptom of a contemporary world.

Véronique Caye is a theater director and filmmaker. She explores the video medium through multiple uses – staging, visual set-design, videos, documentaries, installations, performances and teaching. Through around fifteen shows and several films in France, Europe and Japan, she develops an image dramaturgy that always lets the sensitivity dominate the medium. The installation-performance, *Vera Icona* (2018) is part of a continuation of the art and science research that she carries out in augmented reality and videos with the LIMSI CNRS Paris Saclay with *Genius Loci* [3], *Gardien du Temple* [4] and *La Tempête* [5].

Michèle Gouiffès, researcher at the LIMSI CNRS Paris Saclay laboratory, develops her research on images and videos, which can be seen as sources of information to be analyzed [6], as vectors of interaction and communication [7], objects of representation [8], means of concealing diminished reality in the art-science project *Gardien du Temple* [9]. *Vera Icona* embeds several technical themes such as automatic video processing and real-time interaction. On the theme of video surveillance, the project proposes to turn face detection algorithms into an interactive installation.

This installation-performance has been shown as part of the *Les exils de Mahmoud Darwich* festival at the *Institut du Monde Arabe* in Paris (IMA) in September 2018 [10], in the *hypostyle* hall. With its 900 m² and 140 columns, this room evokes traditional buildings of Arab culture. The IMA building, inaugurated in 1987, was designed by Jean Nouvel, associated with Pierre Soria, Gilbert Lezénés and Architecture Studio.

The rest of the paper is structured as follows. Section 2 offers a reflection on the ecology of images and; image as a symptom of a controlling society, while section 3 details the proposed installation-performance.

2 An ecology of images and, images as symptoms of a controlling society

The starting point for this project was a search in Jerusalem in the footsteps of the "Vera Icona". The story goes that Veronica wore her veil over Christ's face on the Stations of the Cross in Jerusalem, the episode is recorded on Station 6. Today in Jerusalem, on the stations of the *Via dolorosa* also known as *Way of sorrows* or *Stations of the Cross*, the trace of the "Vera Icona", i.e. this imprint image not made by the hand of the man, seems to have disappeared.

It has given way to other images not made by human hands, those of the thousands of automated surveillance cameras that line the Stations of the Cross. Every ten meters, they record the "imprints" of thousands of visitors or inhabitants of the city. The "face of the veil" has been replaced by the "faces" tracked down by these thousands of cameras. Someone behind a screen, controls these images in order to prevent possible "dysfunctions" of this humanity in motion. These new "non-human images" no longer relate to a single face but to thousands of "faces" that have become political instruments.

Ersnt Gombrish, in his anthropological and social approach of "the history of art" [11] considers that images develop according to the context, to an ecology: "*The pictures evolve but the ecology or social context acts back on the reasons why images are made and how they are made. In biology, ecology means that some species can only survive under certain conditions of climate or atmosphere*" [12], and so are images.

The image, thus imprinted with its context, is meaningful and becomes an "image-symptom" to use the words of the philosopher Georges Didi Huberman: not a symptom of a disease [13], but a symptom of an era, of a society that unfolds in a proliferation of everyday images.

Among these images, faces hold a privileged place. They are representative of these "images-symptom" of an era. While face picture has long been reserved for intangible religious representations, the Renaissance made the portrait an instrument for the individual promotion, social success, power and wealth. Made on demand, the portrait arranges and flatters the subject, it brings a message and invites interpretation. Photography has challenged this construction of the image to make it a trace of reality. When it is not staged, the image can be stolen, made without the subject's knowledge.

The portrait can be used as a control instrument. At the end of the 19th century, Alphonse Bertillon made it a standardized means of identification for the police, by integrating anthropometric measurements [14]. At the same time, Sir Francis Galton and Herbert Spencer promoted the technique of *composite portrait* [15], a picture resulting from the superimposition of portraits of a class of individuals, grouped according to social or forensic criteria. Thus, the crime would be written on the facial features. Like the religious icon, the composite portrait refers to an intangible representation. It is interesting to note that this type of image composition is close to the precursor computer techniques

of face description used in *EigenFaces* [16] and *Fischerfaces* [17], where each face is characterized by variations around an average face.

With the boom of video surveillance cameras in public spaces, the image became a political instrument. While its supporters advocate the fight against insecurity and terrorism, its detractors denounce an invasion of privacy. This opposition takes an artistic form with the performances of the New York collective *Surveillance camera players* [18] or Banksy [19] who play with the presence of these cameras to better denounce it. Artists have early put into perspective the sociological, political and liberticidal issues caused by the development of camera control systems. The exhibition *Ctrl [Space], Rhetorics of Surveillance from Bentham to Big Brother* in 2002 [20] offers an in-depth state of the art on the question, for instance with emblematic works such as photographs taken with hidden cameras by Walker Evans at beginning of the 20th century or the work "*Video surveillance piece: public room, private space*" by Bruce Nauman (1969-1970) or "*Time Delay Room 1*" by Dan Graham (1974).

The images captured by CCTV cameras have long been either stored for archiving or viewed by an operator through monitoring screens. Now, they can be analyzed automatically and in real time by algorithms. The recent emergence of artificial intelligence techniques, in particular deep learning since 2012, has enabled the development of extremely powerful face recognition methods. The prevailing algorithms, CNNs for Convolutional Neural Networks, are made of a cascade of multiple layers which is as many levels of image abstraction, each of them learning an increasingly complexity of the image. In 2014, the *DeepFace* algorithm [21] managed to compete with humans in recognition performance, and this task continues to be improved [22]. To do so, the networks are trained using huge databases of images, captured under varying conditions and with a wide variety of poses. For example, the *MegaFace* database [23] contains over 4 million images of faces from over 600,000 different people.

Thus, artists are increasingly interested in the ubiquity of such technologies for real-time tracking and facial recognition. Among the various creations on the topic, the interactive work of Jacques Herzog, Pierre De MeuRon and Ai Weiwei, entitled *Hansel & Gretel* in 2017 [24], offered a reinterpretation of the tale whose protagonists were the spectators and their specters, who evolve in an environment full of sophisticated surveillance technology, where anyone's trajectory is tracked in real time.

However, recognition algorithms are not infallible. They face several difficulties, starting with the variability of facial appearances due to the richness of facial expressions and the illumination conditions. Some artists and privacy activists have therefore designed accessories and clothing intended to distort facial recognition devices, such as the *Surveillance exclusion* mask designed by Jip van Leeuwenstein [25] in 2017 or the *facial projector* invented by Jing-cai Liu [26] which changes the face appearance of whoever wears it.

Thus, everybody leaves traces of her/his passage on a path, which is made in relation in the installation *Vera Icona* with the symbol of Veronica's veil. As Manu Luksh's 2007 film *Faceless* [27] states: "*we are not just a physical body, we are a data body*", "*our body leaves traces wherever it goes*".

3 The installation and performance *Vera Icona*

The installation-performance is inspired by this reflection on the image as a control tool, by drawing our inspiration from the myth of Vera Icona. Whereas the surveillance cameras capture the "imprint images" of passages in public space, the installation proposes to steal the viewer's face in the purpose to give it back to her/him through the image of an "augmented icon". Finally, this icon brings one back to oneself: everyone can identify with it and see oneself through it. The work invites the viewer to consider her/himself free in front of the standards established by the controlling society. This installation is shown along with a performance made by actors and circus artists.

3.1 Description of the installation

The installation is designed in an intentionally sober aesthetic in order to highlight the videos and the architecture of the exhibition space at the Institut du Monde Arabe Paris, IMA (see Fig. 1). It consists of a video projection screen of size 4 by 2 meters in front of which a black desk is arranged for a laptop. A mosaic of videos of passers-by taken in Jerusalem (see Fig.2) is projected on this screen, as a reminiscent of the screen walls used in monitoring centers. However, unlike video surveillance which intends to identify individuals by facial recognition, the sequences focus on the passers-by's feet in order to preserve their identity and their privacy. In its arrangement, this mosaic also refers to a stained-glass window, that is a symbol of openness to the outside world (the context).

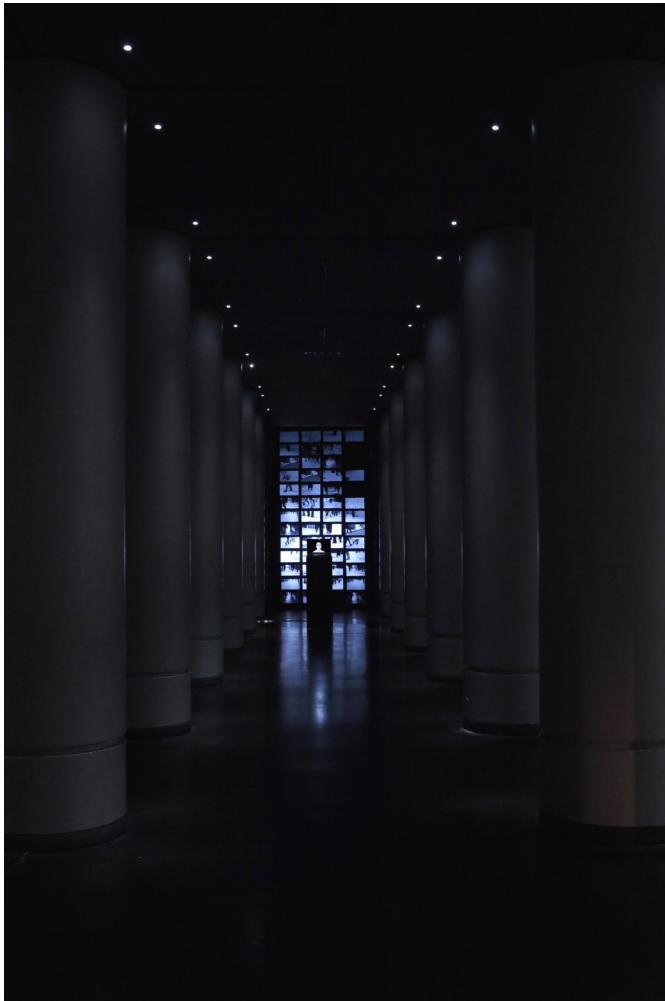


Fig 1. *Vera Icona* at Institut du Monde Arabe, 2018.
© Veronique Caye



Fig. 2. Mosaic of passers-by in Jerusalem (videos).
© Veronique Caye



Fig. 3. The computer-icon. ©Veronique Caye

A soundtrack created by Frédéric Minière is played in interaction with the visitors' movement. When they see the installation from afar, they take part in a sonic journey through the streets of Jerusalem with footsteps, police sirens, church bells, calls to prayer, songs and so on. When they come close to the icon, the latter is transformed and takes features of their own face. At the same time, the noises of the city are interrupted to give way to a sound evoking the heartbeat, to emphasize intimacy. This sound reinforces the astonishment when the spectators see their face and confront themselves with in their own privacy.

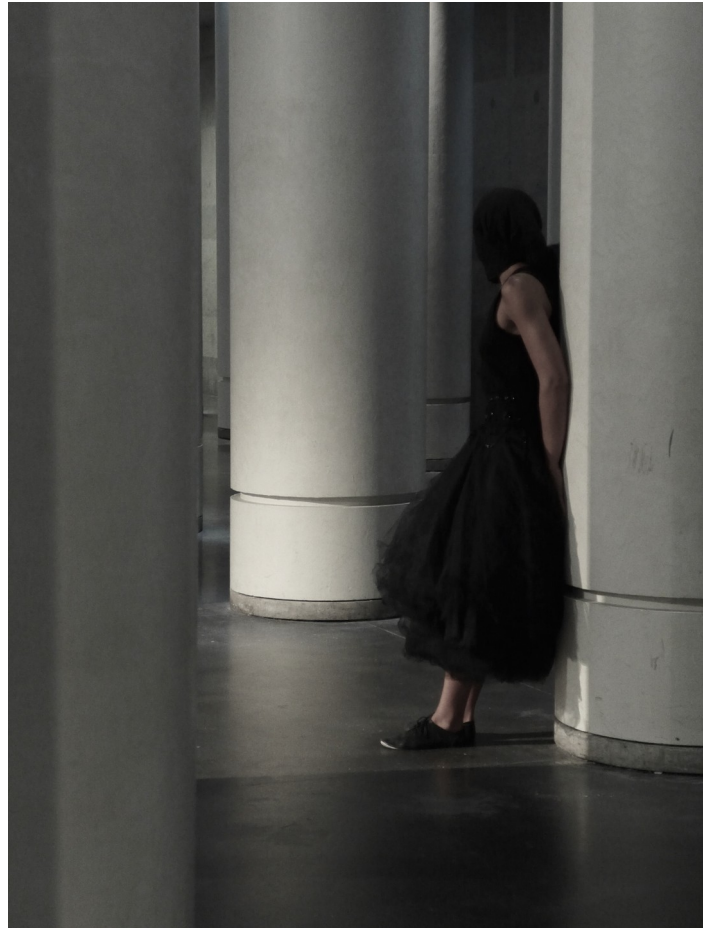
A performance made by actors and circus artists offers a personal reading of the installation (see Fig. 4). Five performers with covered faces, embody the invisible people of our societies, i.e. people whose faces are hidden – as well as their identity – such as homeless people, police officers, some religious people in procession, warriors, fully veiled women, etc. Among the spectators, these invisible ones wander, dance, sing, struggle and inhabit the poetic words of Mahmoud Darwish [28, 29] on oppression and its overcoming. This strange ritual ends with the invisible performers inviting the spectators to come and see their own face in the *computer icon*.



©Veronique Caye



© Michel Assenmaker



© Michel Assenmaker

Fig. 4. A few pictures of the performance.

A video is available online [30] to give an overview of this installation-performance.

3.2 Technical development of the interaction

Algorithms have been developed to create the interaction between the visitors, the videos, the soundscape and the icon image located at the center of the installation.

The developed software exploits two video streams. The first one is the pre-recorded video stream showing the icon, that is a face moving quietly. The second one is the video stream of the visitor's face captured in real time by the standard webcam of the computer (see Fig. 5). From these two videos, the algorithm detects the visitor' face and merges it with the video icon face. This is done in several steps.

The face is first detected automatically in each video using a pre-trained deep learning CNN algorithm from a large database of faces, as explained previously.

Then, a set of 68 anchor points, or facial landmarks, is extracted on the contours and characteristic areas of the two

faces: lips, eyebrows, eyes, nose. This is made by using a cascaded regression method, more precisely an ensemble of regression trees [31]. These points are used to initialize a Voronoi diagram that provides a complete tiling of the face into different regions. Finally, each region of the visitor's face undergoes a simple geometric transformation modeled by an homography matrix that operates a registration to the homologous region of the icon face. This transform is estimated by an optimization method. Each video is converted in gray level and a photometric normalization is achieved in order to reach a better quality of the merging. Pepper noise is added for aesthetic purposes.

In addition, this program triggers an event during the detection of the visitor and sends it to the *Max for Live* software via UDP (using OSC Open SoundControl [32]) to control the change of sound environment. The code was developed in C + + at LIMSI with the help of several opensource libraries: OpenCV [33] and Dlib developed since 2009 [34].



Fig. 5. The visitor's face is captured by the computer-icon. ©Veronique Caye

Conclusion

In the footsteps of *Vera Icona* in Jerusalem, the installation offers a metaphor for its legend, in new Images not made by hands but produced by the city's thousands of surveillance cameras.

Using an augmented reality video system, the installation creates a *mise en abyme* with the faces of the watched and the faces of the watchers.

The installation gives the viewer a central place: thus one's face disappears from public surveillance cameras (the projected video only captures the legs), and appears in the *mirror image* of the icon. The computer vision and interaction technology developed for the installation invites us to reinvest our physical world, to consider ourselves at the center of the universe, far from dogmas, far from the controlling society and far from the established social systems.

The installation offers a meditation on the relationship between humanity and image: it invites the viewers to consider themselves free in a society where virtuality is more and more present .

Beyond the image, it should question us about the many traces left on our virtual paths, and about the political use that can be made of them.

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