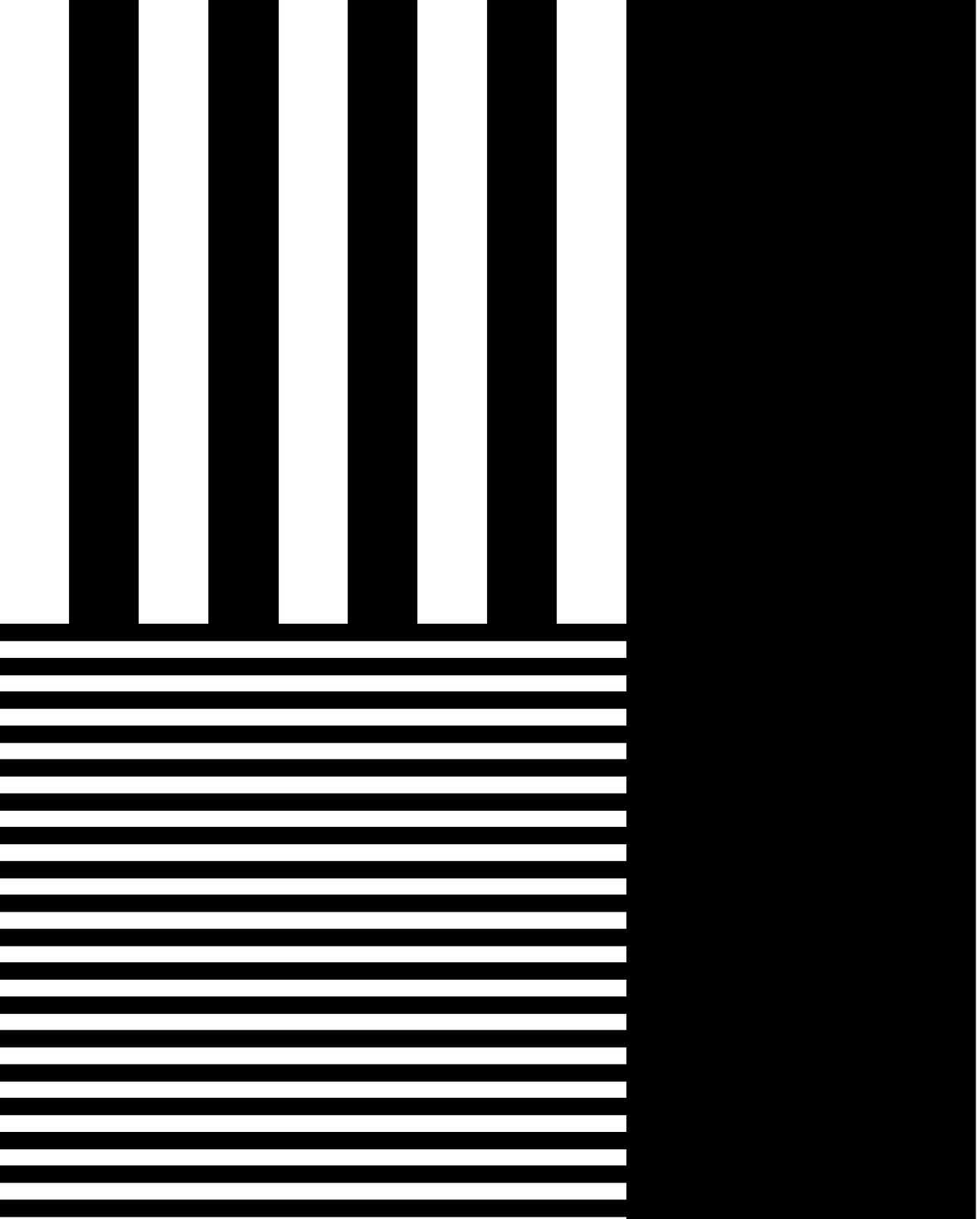

AUTOMATED PHOTOGRAPHY

Edited by Milo Keller, Claus Gunti, Florian Amoser
A research project by the MA Photography at
ECAL/University of Art and Design Lausanne

I. CAPTURE AND AUTOMATION

II. IMAGES AND DATA POLITICS

III. AUTHORSHIP AND AGENCY

IV. COMPUTATION AND THE REAL

V. CONVERSATIONS

VI. APPENDIX

COMPOSITE IMAGES. ON THE TRANSFORMATION OF VISUAL TRUTH CLAIMS.

It was a peculiarity of Western modernity —the cultural constellation that extended, roughly, from the mid-15th to the mid-20th century [01]— to claim not only that images represent the material world as it is appears to a single, distant observer but also that what can be seen in this way is what counts. In other words, it constituted both a visual and an epistemological regime. [02]

On the surface, contemporary digital image-making technologies are extending the visual dimension of this regime by creating ever more 'realistically' detailed images (HD, UltraHD, 4K, 8K, Gigapixel, etc). However, they are also fundamentally undermining it, by moving from recording to generative methods in the production of images. Moreover, the epistemological dimension has also come under pressure. Reality is becoming ever more complex and distributed, eroding the ability of a single, distant observer to make sense of it. [03] Second-generation cybernetics has suggested since the 1970s that the observer is always part of the system he/she/it observes. [04] From the 1980s onward the field of feminist science studies has critiqued the position of the distant observer as that of a "view from nowhere" or "god's view" and proposed instead the notion of situated knowledge(s) —located, embodied, entangled and partial. [05]

While there has been much debate about the loss of representational quality in digital images over the last 25 years, [06] I want to advance a different argument. Digital images, if we understand them as composites rather than indices, offer the possibility of developing a new visual regime in line with the transformed epistemological situation, from which a new type of realism and claim to visual truth can be created.

01 Marshall McLuhan, *The Gutenberg Galaxy: The Making of Typographic Man* (Toronto: University of Toronto Press, 1962).

02 Bruno Latour, "Visualization and Cognition: Drawing Things Together," in *Knowledge and Society — Studies in the Sociology of Culture Past and Present*, ed. Henrikka Kuklick (Stamford, CT: JAI Press Inc., 1986), 1–40, accessed February 4, 2021, https://www.bruno-latour.fr/sites/default/files/21-DRAWING-THINGS-TOGETHER-GB.pdf

03 Felix Stalder, "From Inter-Subjectivity to Multi-Subjectivity: Knowledge Claims and the Digital Condition," in *Being Profiled: Cogitas Ergo Sum*, eds. Emre Bayamlioglu, Irina Baraliuc, Liisa Janssens and Mireille Hildebrandt (Amsterdam: University of Amsterdam Press, 2018), 98–101, accessed May 3, 2019, https://www.aup.nl/en/book/9789463722124/being-profiled-cogitas-ergo-sum

04 Heinz Von Foerster, "Cybernetics of Cybernetics," in *Understanding Understanding: Essays on Cybernetics and Cognition* (New York: Springer, 2003), 283–86.

05 Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," *Feminist Studies 14*, No. 3 (1988): 575–99.

06 Geoffry Batchen, "Phantasm: Digital Imaging and the Death of Photography," *Aperture* 136 (1994): 46–51.

Reality – Mirror – Image

The central perspective, first articulated by the architect Filippo Brunelleschi around 1420, was the key element in the modern organisation of the visual. Its aim was to represent the visible world by accurately transferring three-dimensional objects onto a two-dimensional surface. The claim to veracity and realism was established in a famous experiment, which the art historian Samuel Edgerton describes as follows:

> *After painting the picture [of the San Giovanni Baptistery in Florence] Brunelleschi drilled a small hole through the panel and then had his viewer look through this hole from the backside of the panel. In this other hand, the viewer was to hold a mirror in front of the picture, reflecting the image as seen through this hole.* [07]

07 Samuel Y. Edgerton, *The Mirror, the Window, and the Telescope: How Renaissance Linear Perspective Changed Our Vision of the Universe*, (Ithaca: Cornell University Press, 2009), 46.

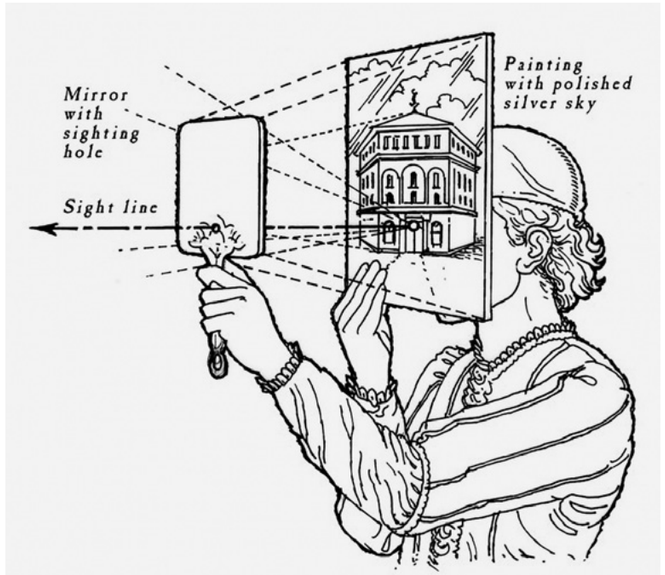

FIG.01 HTTPS://DRAWINGACADEMY.COM/WP-CONTENT/UPLOADS/2014/12/BRUNELLESCHI-REDISCOVERS-LINEAR-PERSPECTIVE.JPG

Holding the mirror in hand, the viewer could see not only the mirror image of the painting but, by moving the mirror away, s/he could see the Baptistery itself and thus establish a direct correspondence between the external reality as seen by the immobilised eye and the representation shown by the painting. The mirror, one could say, was the first in a long line of technical apparatuses to produce images that would represent the world as it could be seen 'naturally' by the painter and, later, the photographer or camera operator, so that others who were absent in time and/or space could see it as well. This direct correspondence between the image and external reality, between the sign and the signified, is called its "indexicality". [08]

08 Tom Gunning, "What's the Point of an Index? Or, Faking Photographs," *Nordicom Review* 5, No. 1/2 (2004): 39–49.

The representational character of the images was created and stabilised along two vectors. The first was the technical character of the apparatus itself that produced the visual image. While its physical set-up was often sophisticated, based on state-of-the-art technologies [09] and thus quite variable over time, the mechanistic premise remained straightforward and consistent across all devices: the apparatus was to simply reflect/record what was in front of it, without interfering with the object and independent of the person setting up the apparatus. It showed the world as an individual person would see it, but this way of seeing was not individualistic in a modern sense, it was, as one would later say, scientific, that is, inter-subjective and objectively rational (i.e. following logical principles). The second dimension was cultural, creating its epistemological capacities. Images always appeared contextualised in a particular physical and narrative order that implied a certain type of reading. For example, in modern museums, images are almost always hung at eye level, which, as Daniel Rubinstein reminds us, "reinforces the rhetorical tropes of perspectival painting inherited from the Renaissance." [10] Probably even more importantly, they are also placed in a specific and stable narrative order that frames our expectations and guides our reading of the images. In the modern museum, this context is so stable and can be taken for granted to such a degree that it receded into the background, and the idea emerged that the work of art is autonomous, that is, can be read independently from its surroundings and contains everything that is relevant within it. Outside of the rarefied world of auratic originals, books, magazines and even commercial catalogues also present images as part of a particular cultural narrative that stabilises their meaning and helps to assess their correspondence to an external reality.

09 This also applied to Brunelleschi. At the time, the flat mirror was a sophisticated and advanced device, and the optical/mathematical knowledge had arrived only recently in Europe from the Arab world; see Hans Belting, *Florence and Baghdad: Renaissance Art and Arab Science*, 1st English language ed. (Cambridge, MA: Belknap Press of Harvard University Press, 2011).

10 Daniel Rubinstein, "What Is 21st Century Photography?," *The Photographers' Gallery* (blog), February 23, 2015, accessed January 4, 2021, https://thephotographersgallery.org.uk/content/what-21st-century-photography

These two elements —the apparatus as a mechanistic image-recording device and the insertion of each image into a specific and decipherable cultural narrative— created the conditions in which the image could assume a representational character. Of course, not all images are representational, and PR and propaganda have long abused the expectation of a correspondence

between image and reality, but even this abuse relies on the underlying assumption remaining reasonable in most cases. However, neither of these elements remain operative in contemporary digital image production.

Politics – Generation – Reality

In the early 1930s, Walter Benjamin was the first to notice that the ability to mass reproduce images had a profound effect on their meaning for the viewer. For one, the viewer no longer had to visit the place where the original image was on view, often a specific location such as museum or church, where it retained some of its sacred heritage. Rather, the image came to the viewer and could be viewed in his or her own surroundings, hence it would not only appear in a different context but also as an object of use, not distinctly different from other objects in that profane surrounding. In the process, as Benjamin wrote, the function of the image is reversed, "instead of being based on ritual, it begins to be based on another practice – politics." [11] By this he meant that the meaning of the image enters into a process of negotiation, in which its heritage —its original meaning as ascertained by specialists— is no longer the decisive factor. Rather, meaning is based on what is being done with the image in the present. The image opens up, and in that opening different meanings come onto conflict with one other, hence it enters the realm of politics.

Second, reproducibility also allows for different and conflicting arrangements of these images. In principle, every image can be brought into direct contact with any other. Continuous narrative arrangements are broken up and replaced by the principle of the montage, which, as Benjamin put it, created a "shock-effect" stemming from the unpredictability of the montage and its fragmented aesthetics. For Adorno, similarly to Benjamin, "the principle of montage was conceived as an act against a surreptitiously achieved organic unity; it was meant to shock." [12] This positive effect of breaking up outdated conventions and assumptions —about images and about reality— was short-lived, however. As Adorno noted, "once this shock is neutralised, the assemblage once more becomes merely indifferent material; the technique no longer suffices to trigger communication between the aesthetic and the extra-aesthetic, and its interest dwindles to a cultural-historical curiosity." [13]

11 Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction (1935)," in *Illuminations*, ed. Hannah Arendt (New York: Schocken Books, 1969), 214–18.

12 Theodor W. Adorno, *Aesthetic Theory*, eds. Rolf Tiedemann and Gretel Adorno (London, New York: Continuum, 2002), 157.

13 Ibid.

14 Hito Steyerl, "In Defense of the Poor Image," *e-flux Journal* 10, November 2009, accessed January 6, 2021, https://www.e-flux.com/journal/10/61362/in-defense-of-the-poor-image/.

15 David Joselit, *After Art* (Princeton: Princeton University Press, 2013).

16 Felix Stalder, *The Digital Condition* (Cambridge, UK, Medford, MA: Polity Press, 2018).

17 Daniel Rubinstein, "Post-Representational Photography, or the Grin of Schröding-er's Cat," in *Photography Reframed: New Visions in Contemporary Photographic Culture*, eds. Benedict Burbridge and Annebella Pollen (London, New York: I.B. Tauris, 2018), 8–18.

18 "The Kuleshov effect is a film editing (montage) effect demonstrated by Soviet filmmaker Lev Kuleshov in the 1910s and 1920s. It is a mental phenomenon by which viewers derive more meaning from the interaction of two sequential shots than from a single shot in isolation." https://en.wikipedia.org/wiki/Kuleshov_effect

19 Jean Lave and Etienne Wenger, *Situated Learning: Legitimate Peripheral Participation* (Cambridge, UK, New York: Cambridge University Press, 1991).

20 "The paradox of tolerance states that if a society is tolerant without limit, its ability to be tolerant is eventually seized or destroyed by the intolerant. Karl Popper described it as the seemingly paradoxical idea that in order to maintain a tolerant society, the society must be intolerant of intolerance." https://en.wikipedia.org/wiki/Paradox_of_tolerance

Today, the reproducibility of images is, of course, orders of magnitude greater than Benjamin and Adorno could have imagined, and the evolution they described has reaches its potentially final point. Images are losing all trace of being rare things that have a more or less fixed place in institutions, books, magazines or films that exist in a particular location (even as fleetingly as a projection in a cinema). Rather, they reach us in a steady stream of poor images, "cop[ies] in motion" [14] on our screens, which, thanks to the mobile phone, we take with us everywhere. In other words, images now form a flow that has neither a clear origin nor a clear destination, whose very essence is its ability to circulate at high speed. [15] That stream, moreover, is endlessly variable, and its sequence and composition, at least in terms of signification, are arbitrary. [16] The old classification schemes —stable, coherent and, inevitably, biased— which still dominate Gutenberg-era institutions such as museums and archives, are no longer capable of organising this mass of images. They have given way to dynamic, unstable arrangements, without coherence and differently biased. Anything can be followed by anything else, and the sequence itself does not need to exhibit human-readable meaning, very much unlike the montage in a collage or a film. Thus, the process of dissociating the image from its origin and opening up its meaning has become so extreme that images in and of themselves are losing all meaning because, as they depend on a freely variable context, they can mean more or less anything. [17] Our entire visual experience, it seems, has turned onto a gigantic, high-speed, never-ending Kuleshov effect. [18] Everything is constantly rearranged, producing endless meanings, which, potentially, cancel each other out. In this sense, both Benjamin, who saw this as an opening for new political engagements, and Adorno, who saw how the cultural industry would use this for its own controlling purposes, remain relevant. The first view points to the emergence of ever new "communities of practice" [19] which, by organising their own selection of materials, produce specialised knowledge and cultures, often in contradiction with mainstream positions. This has led to greater cultural diversity as part of a long historical trend of social liberalisation, even if the enemies of this trend also profit from the greater freedom this affords (an old problem, which Karl Popper called the "paradox of tolerance") [20]. But, at the same time, as the streams of images and other cultural artifacts become ever larger, the role of algorithms in organising them has grown ever more pronounced, tipping the balance of meaning-making power decisively in favour of those who

control the infrastructure that enables and channels these flows. The problem is, 'meaning-making' in this case is not necessarily human-readable, at least not for those swimming in the thus generated streams. Rather, it is a machinic meaning, geared not towards intelligibility but towards metrics, engagement in this case, a stimulus-response mechanism that provides the energy to keep the streams flowing. Meaning, in a cultural, narrative sense is not necessary for this strategy. If Adorno and Horkheimer's cultural industries produced false consciousness, contemporary social mass media require no consciousness at all. Excited confusion is all that is necessary. As a consequence, the cultural vectors that stabilised images are no longer operative.

The technical apparatuses of image-making (distinct from reproduction and circulation) have been transformed as least as profoundly. Even devices that create relatively conventionally-looking images, say cameras on mobile phones, are no longer passive recording devices but are actively and adaptively generating images, often by combining multiple shots into a single image and processing the underlying data according to some statistically-defined criteria of a 'good image'. The relation between the recording of an external reality and the computational generation of an image is, in practice, unknown and constantly changing, both with regards to the concrete situation of the image being recorded (sometimes more, sometimes less computational adjustments are necessary to make it adhere to predefined standards) and with regards to the capacities of the device, which change as the software is updated with or without the knowledge of its user. But this is only the tip of the iceberg. New post-processing methods are now capable not only of adding or removing static details but of transforming the very structure of the image, including moving images, turning a rainy day into a sunny one, adding the face of one person onto the body of another one, and so on. At the same time, computer graphics are constantly evolving, leading to a merger between images that are recorded and images that are generated, to the degree that their combination becomes a question of production expediency, rather than ontology. Under such circumstances, images can no longer make reliable representational claims.

Unsurprisingly, the most extreme cases of such generated images, called 'deep fakes', because they use 'deep' learning methods to create non-representational ('fake') images, have been called a "threat to democracy" [21] because people can no longer trust the images they see

21 Simon Parkin, "The Rise of the Deepfake and the Threat to Democracy," *The Guardian*, June 22, 2019, accessed January 6, 2021, https://www.theguardian.com/technology/ng-interactive/2019/jun/22/the-rise-of-the-deepfake-and-the-threat-to-democracy.

on social media, reviving, once more, debates about the lost indexicality of digital images. However, even though the technology to produce deep fakes is widely available and the political contest of the most recent US presidential election was fought bitterly around very narrow margins, deep fakes played no role in it. While the reasons are not entirely clear, it has been suggested that the production of deep fakes is still somewhat cumbersome and easy to detect, and, more importantly, not necessary because there are other, cheaper and more effective means of spreading political disinformation. Deep fakes, however, are very damaging in other areas. [22] According to current estimates, 96% of all deep fakes are pornography related, usually placing the face of a woman onto the body of an actor in a pornographic scene. [23] The problem here is not the untruthfulness of the images, which is usually quite obvious. It is their effectiveness, not in revealing an already existing truth, but in colonising the imagination. They are not about the past or the present, they are about the future. Such images cannot be 'unseen', that is, forgotten, even if the viewer knows that they are entirely fabricated. They clearly represent a personalised misogynist fantasy —the reduction of a particular woman to a sex object— but it is the power of the projection itself that does the harm, not its confusion with reality. These videos show a vision of how the world should be (in the eyes of those who produce them), which gains its power from being counterfactual. In other words, the sequence of relations has been turned around. As part of a political vision, an image is generated which then shapes reality.

22 Tom Simonite, "What Happened to the Deepfake Threat to the Election?," *Wired*, November 16, 2020, accessed January 6, 2021, https://www.wired.com/story/what-happened-deepfake-threat-election/

23 Henry Ajder, Giorgio Patrini, Francesco Cavalli and Laurence Cullen, *The State of Deepfakes: Landscape, Threats, and Impact*, Deeptrace, September 2019, https://regmedia.co.uk/2019/10/08/deepfake_report.pdf

From Representation to Evidence

This new sequence of relationships creates a challenging situation. It undermines established forms of asserting truth (by way of representational images) and often empowers undemocratic, authoritarian actors (with misogyny being a form of authoritarianism). What should be done about this? There is a tendency to task the providers of the infrastructure with policing the flow of material through their networks, hoping to re-establish the boundary between indexical and generated images. [24] While some of this may be necessary, it is very possible that this does more harm than good. First, with digital images, drawing this boundary is more or less arbitrary. Second, delegating

24 European Commission, *Code of Practice on Disinformation*, October 2018, https://ec.europa.eu/digital-single-market/en/code-practice-disinformation.

this power to social media companies only further concentrates power in their hands, or, more precisely, in the hands of their owners (Facebook's majority owner, by statute, is a single person, Mark Zuckerberg). Do we really want to put that much power, so poorly defined, in so few hands?

Another approach might be to drop the simple representational claim of the image inherited from the Renaissance, the central perspective and the photographic lens. That claim, to stress the point, was a double one. First, that the three-dimensional world could be transferred to a two-dimensional pane corresponding to what a single person could see, at a particular time, from a particular vantage point. Second, that it was possible to make sense of the world, from the point of view of a single person, standing at a particular point, at a particular time. While the first claim can still be technically accurate (if less and less practiced), its importance is greatly diminished because in a world of dynamic, distributed complexity, the single point of view is no longer capable of representing reality. In such a context, visual accounts of reality become based on data visualisation. They do not point to a single thing —neither in front, in, or behind the camera— but rather to dynamic networks of relationships. In other words, images are composites. Their truth claim lies in their method of composition, rather than in their indexicality.

It is not surprising that the defining image of the Covid-19 epidemic is not a photograph but a graph, with a curve representing the rise in infections in relation to local healthcare systems' capacity to care for patients, and that the image, representing past, present and future, is not only descriptive but, by being part of the situation it makes accessible, also provides perspective ("flatten the curve!").

It is, perhaps, best to first acknowledge the artificiality of all images (even those that cultural habit makes appear natural) and not to fight but to embrace the composite character of contemporary images, both in terms of the production of individual images and sequences as well as in how these fragmentary, fragile and contested accounts are put together to create a more complex account of the world beyond the here and now visible to the naked eye.

With this in mind, the artist Paolo Cirio calls for a new approach, which he names "evidentiary realism," to provide a new aesthetics of truth claims. In the catalogue of the eponymous exhibition, he writes:

> *The real is present and concrete, yet complexity, scale, speed, and opacity hide it from sight. The contemporary features of the social landscape are unintelligible at first glance. Although we see the shocking results of our social reality, we are nonetheless often unable to see the systems and processes that generate such conditions. ... [Evidentiary] realism looks beyond visible social conditions. [It] examines the underpinning economic, political, legal, linguistic, and cultural structures that impact society at large. These evolving social fields are highly interconnected and often too complex and high-speed to grasp —if not secret, imperceptible, opaque, or manipulated by advanced rhetorical devices. Reality today can only be fully apprehended by pointing at evidence from the language, programs, infrastructures, relations, data, and technology that power structures control, manipulate, and hide.* [25]

25 Paolo Cirio, *Evidentiary Realism: Investigative, Forensic, and Documentary Art* (Berlin: Nome Gallery, 2017), 3.

In other words, given its complexity, scale and speed, contemporary reality can no longer be represented by an indexical image. However, evidence of its constitutive processes can be assembled via images. Perhaps the most advanced example of this post-indexical realism is the work of Forensic Architecture, a multidisciplinary research group based at Goldsmiths, University of London. In this work, complex composite images (still and moving) are created from a myriad of sources, some of which were created with intention, say, a smart phone video, while others were recorded automatically, say, GPS data. Each of these sources, in isolation, is partial and fragmentary, recording only tiny aspects of a complex situation, and all of them are floating around in ways that render their meaning highly unstable and contestable. Rather than looking for the one strong image (or, more generally, a single reliable data source), Forensic Architecture assembles a great number of weak, contested and unstable data points (some of which are images in the traditional sense, although their meta-data is equally important) and links them so that they provide a stabilising, interpretative context for each other. In this manner, from weak materials, a strong composite emerges. Aesthetically, the fact that images are composites is not hidden. On the contrary, it is a major narrative device, opening up the composite to an examination of the methods of composition and thus making its truth claims accessible and debatable. It is important to note that Forensic Architecture sees its practice not as uninterested observation but as part

of a counter-hegemonic struggle. [26] Its practice is often situated in the context of court trials where evidence presented is always partisan —presented by either of the parties with an interest to advance its case— but also with a required claim to factuality.

Embracing the artificiality of the image to create a new kind of realism —de-centred, multi-perspective, composed of heterogeneous sources, transparent to the underlying processes (of data generation and composition)— opens up the most promising approach to overcoming the crisis of the image and generating new visual truth claims. It acknowledges both the new generative character of image-making as well as the contemporary character of reality —complex, dynamic and drawn out in space and time, full of actors with their unique vantage points and saturated with diverse data and media. In other words, the composite image creates both an aesthetic and epistemological regime. It updates the capacity to make debatable truth claims, which lies at the heart of the collective, peaceful contestation of the past, present and future that is democracy. In this spirit, we should embrace, rather than fear, the artificiality of the composite image.

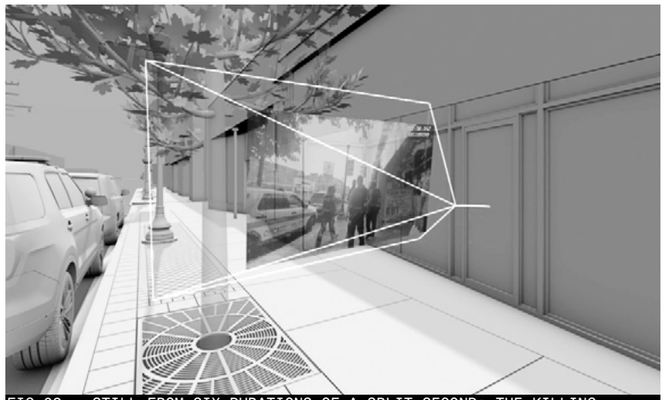

FIG.02 STILL FROM SIX DURATIONS OF A SPLIT SECOND: THE KILLING OF HARITH AUGUSTUS, FORENSIC ARCHITECTURE AND THE INVISIBLE INSTITUTE (2019).

26 Eyal Weizman, *Forensic Architecture: Violence at the Threshold of Detectability* (Brooklyn, NY: Zone Books, 2017).

ECAL/UNIVERSITY OF ART
AND DESIGN LAUSANNE

AUTOMATED PHOTOGRAPHY
RESEARCH PROJECT

DIRECTOR OF ECAL
Alexis Georgacopoulos

HEAD OF RESEARCH & DEVELOPMENT
Davide Fornari

HEAD OF RESEARCH PROJECT
Milo Keller

RESEARCH TEAM
Claus Gunti
Florian Amoser

RESEARCH ASSISTANTS
Robin Bervini
Calum Douglas
Thomas Le Provost

VISITING LECTURERS
Nora Al-Badri
Area of Work
(Amine Ghorab
& Scott Renau)
Lewis Bush
Kurt Caviezel
Lauren Huret
Marco De Mutiis
Lauren Moffatt
Simone C Niquille
François Zajéga

INSTITUTIONAL PARTNERSHIP
La Becque

STRATEGIC PARTNERSHIPS
Cécile Vulliemin

EXHIBITION DESIGN
Adrien Rovero
Arthur Cotteaux

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and Design Lausanne
HES-SO, University of
Applied Sciences and Arts
Western Switzerland

STUDENTS
Sara Bastai
Emidio Battipaglia
Emma Bedos
Robin Bervini
Maeva Bosko
Alexey Chernikov
Mattia Dagani Rio
Jasmine Deporta
Clemens Fischer
Nikolai Frerichs
Anja Karolina Furrer
Mahalia Giotto
Alessia Gunawan
Christian Harker
Hikaru Hori
Jung-Ting Hu
Johanna Hullár
Sally Jo
Philipp Klak
Doruk Kumkumoğlu
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Yshao Lin
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Sophie Schreurs
Alisa Strub
Yang Su
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Joanna Wierzbicka
Olivia Wünsche
Manqin Zhang

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Sabine Himmelsbach
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Luc Meier
Antoine Martin
Antonio Mouralinho
Tibor Udvari

PHOTOGRAPHY
PUBLICATION

EDITORS
Milo Keller
Claus Gunti
Florian Amoser

PUBLISHER
ECAL
Mörel Books

INTERVIEWS
Joël Vacheron

CONTRIBUTORS TEXTS
Emmanuel Alloa
Florian Amoser
Yung Au
Ann-Christin Bertrand
Estelle Blaschke
Marco De Mutiis
Claus Gunti
Milo Keller
Clément Lambelet
Boris Magrini
Simone C Niquille
Felix Stalder
Anne-Katrin Weber

CONTRIBUTORS IMAGES
Florian Amoser
Sara Bastai
Emidio Battipaglia
Emma Bedos
Simone C Niquille
Alexey Chernikov
Gaël Corboz
Nikolai Frerichs
Gohan Keller
Philipp Klak
Augustin Lignier
Valentin Woeffray

GRAPHIC DESIGN
Thomas Le Provost

PROOFREADING
Alex Craker

INTERVIEW TRANSCRIPTION
AND PROOFREADING
Janine Armin

PHOTOLITHOGRAPHY
James Pascale

OFFSET PRINTING & BINDING
La Buona Stampa SA,
Lugano

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An increasing number of images are produced autonomously by machines for machines in a technological architecture that progressively excludes human intervention. A research project developed by the MA Photography programme at ECAL/University of Art and Design Lausanne, Automated Photography addresses this situation by investigating imaging technologies such as machine learning, drones, AR, CGI or computational photography. A collection of critical essays and interviews from curators, art historians, philosophers, artists, designers, media theorists and experts in digital culture aims to examine the implications of these transformations in terms of agency, data politics or relationship to reality, while a selection of visual projects explores the aesthetic and conceptual potential of automated photography. www.automated-photography.ch

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