

WHICH OPERATIV- ITY? ON POLITICAL ASPECTS OF OPER- ATIONAL IMAGES AND SOUNDS

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“Operational’ now turns out to be characterized by mutual connections and interdependencies, which is why this politically motivated and complicating concept is so useful for opening up the diverse interface processes that are in use today on a planetary scale.”

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Harun Farocki sits in front of his editing program pointing at the monitor. "So, for the posterity, I'm going to say that I'm cutting two tracks here," he begins to talk with a self-deprecating smile in Christoph Hübner's film *Dokumentarisch arbeiten* (2004/2005).¹ The two tracks are tested for the third part of his installation series *Eye/Machine I–III* (2000–2003). With this, as with *War at a Distance* (2003) and *Counter Music* (2004), Harun Farocki deepens his interest in what he calls "operative images" or "operational images"². At this point, it is not foreseeable that this term, as a highly influential guiding concept, will long outlast the sudden passing of Harun Farocki in 2014 and (to date) become an international field of research³ – also in the context of *Interface Critique*⁴.

1 *Dokumentarisch arbeiten: Harun Farocki im Gespräch mit Christoph Hübner*, TV documentary by Christoph Hübner (WDR/ZDF, 2004/2005).

2 Although Harun Farocki had translated the term "operative Bilder" sometimes as "operative images" and sometimes as "operational images," the latter has since widely prevailed.

3 See, among others, Ingrid Hoelzl (ed.), *The Operative Image* (2014), <https://mediacommons.org/tne/cluster/operative-image>, access: September 14, 2022; Niels Van Tomme, *Visibility Machines: Harun Farocki and Trevor Paglen* (Baltimore 2015); Andreas Broeckmann, *Machine Art in the Twentieth Century* (Cambridge, MA 2016); Jan Distelmeyer, *Machtzeichen. Anordnungen des Computers* (Berlin 2017); Jens Eder and Charlotte Klöckl (eds.), *Image Operations: Visual Media and Political Conflict* (Manchester 2017); Luisa Feiersinger, Kathrin Friedrich and Moritz Queisner (eds.), *Image – Action – Space: Situating the Screen in Visual Practice* (Berlin 2018); Jussi Parikka, *Operational Images* (2022), <https://jussiparikka.net/category/operational-image/>, access: September 14, 2022.

4 See Jan Distelmeyer, Drawing Connections. How Interfaces Matter. *Interface Critique* 1 (2018): 22–32; Christoph Borbach, Navigating (through) Sound. Auditory Interfaces in Maritime Navigation Practice, 1900–1930. *Interface Critique* 2 (2019): 17–33; Matteo

This terminological success story is the starting point for my considerations. For as established as the concept of operational images is today, it is easy to lose sight of a motivation that is essential to its emergence and just as important to its productivity for dealing with contemporary automation and computerization. It is a political motivation in need of explanation and discussion. Turning to this seems to me particularly helpful for asking about the planetary dimensions of the interface processes that are constantly at work for that part of our reality based on hardware and software and performed by means of networks, platforms and "algorithmic decision making"⁵ a.k.a. artificial intelligence.

Operational Images and Diagrammatics

"Well, I call those 'operational images,'" Harun Farocki explains to Christoph Hübner, "in the sense of images that aren't there to report anything." At this moment images from a surveillance camera can be seen on which cars are marked with a square, as these images are not primarily made for the human eye, but elements of

Pasquinelli and Vladan Joler, The Noosphere manifested: AI as instrument of knowledge extractivism. *Interface Critique* 3 (2021): 37–68

5 AlgorithmWatch, *Automating Society 2019*. <https://algorithm-watch.org/en/automating-society-2019/>, access: September 14, 2022.

an image processing for the purpose of machine automation, in this case a traffic light control.

To this day, operational images are considered to be those images “that are absorbed in a technical execution”⁶, that are “part of an operation”⁷. The term “operational” is intended, as Volker Pantenburg has emphasized, to draw attention to the fact that an image “no longer stands ‘for itself’ in any way but is merely an element of an electro-technical operation”⁸. The interest in machine processes comes into focus, which operational images do not represent, but instead take part in.

The discourse and (artistic) research on operational images have branched out and deepened based on this understanding. For example, Trevor Paglen has pointed to “a kind of irony” that the *Eye/Machine* installations are actually not “composed of operational images” but rather “composed of operational images that have been configured by machines to be interpretable by humans”⁹. However, to a certain extent this composition is less ironic than consistent, for the operativity of these images takes place on several, not only technical-apparative levels.

6 Harun Farocki, *Quereinfluss / Weiche Montage*, in: *Zeitsprünge. Wie Filme Geschichte(n) erzählen*, ed. Christine Ruffert et al. (Berlin 2004), pp. 57–61, here 61.

7 Harun Farocki, *Phantom Images*. *Public. Art, Culture, Ideas* 29 (2004): 12–22, here 17.

8 Volker Pantenburg, *Farocki/Godard. Film as Theory* (Amsterdam 2015), p. 210.

9 Trevor Paglen, *Operational Images*. *e-flux* 59 (2014), <https://www.e-flux.com/journal/59/61130/operational-images/>, access: September 14, 2022.

The interest in interdependencies shapes the decided openness of Harun Farocki’s approach to operational images from the very beginning. Not meant as a strict definition, rather as a specific and politically motivated working title for the question of a systemic and perhaps paradigmatic change of images on the way to automation and more-than-human agencies and infrastructures, for which humans nevertheless remain responsible. “It’s all very limited and it’s not true in an endless way,” he admits in *Dokumentarisch arbeiten*, “but in this context, these are always different images.”¹⁰

What makes those images “different” depends on what forms of operations are at work here. This question of operativity (what operates here and how, under what conditions, for what purposes, and with what effects) leads to revealing connections and (depending on the perspective) differences between the concept of operational images and diagrammatics.

With regard to the “operational imagery” developed by Sybille Krämer for a diagrammatic approach focusing on written texts, diagrams, graphs, and maps, for example, there is a clear distinction. Precisely those “images of use” [*Gebrauchsbilder*] in the “context of ‘remote-controlled pictorial action’ in the military, medicine, and research, but also in the interactively accessible virtual spaces” that Sybille Krämer explicitly does “not count as part of the phenomenon of op-

10 Hübner, *Dokumentarisch arbeiten*.

erational imagery"¹¹ belong for/with Harun Farocki to operational images.

Beyond that approach, however, the field of diagrammatics (and especially its relations to semiotics) also includes other forms of operativity, which definitely show overlaps with the concept of operational images, such as Birgit Schneider's, Jussi Parikka's, and Aud Sissel Hoel's observations have underlined. Schneider distinguishes four levels on which diagrams can become operative: In addition to "extrinsic operativity," in which diagrams "help shape, change, or even trigger a process," and a dual "cognitive operativity" (in producing diagrams and looking at diagrams), this also includes "intrinsic operativity." *Intrinsic* here implies that diagrams themselves become operative: in the form of circuit diagrams, for example, they "can themselves be electrified, materializing the operation of a diagram."¹² It is this intrinsic operativity that Jussi Parikka – referring to Wolfgang Ernst's media archeological research („diagrams are to be understood in the very technical sense of a visualization of information patterns, circuits and relations which give an idea of how the

otherwise so complex machines work"¹³) – calls "operative diagrammatics."¹⁴

Thus, it becomes obvious that broader and quite diverse notions of operativity are also at work in the tradition of diagrammatic discourse, which shows a further, fundamental proximity to Harun Farocki's research on operational images. Aud Sissel Hoel has highlighted this with references to Lev Manovich, Wolfgang Ernst, Frederik Stjernfelt, and Charles Sanders Peirce.¹⁵ Her related call to reconsider what is actually meant to be addressed by the adjective "operative" connects her perspective to that of Jens Eder and Charlotte Klonk¹⁶ and also to my approach. This, however, does not apply to Hoel's notion of interface, which – "in the epistemological and ontological sense as intermediaries to the world and other people"¹⁷ – hardly seems to differ from the notion of medium. Operativity here, in any case, cannot be understood as either human or non-human agency, but is rather multi-layered and relational. In this respect, "operative"/"operational" actually denotes less a finding than an appeal to investigate the operations in question.

11 Sybille Krämer, *Operative Bildlichkeit. Von der Grammatologie zu einer 'Diagrammatologie'? Reflexionen über erkennendes Sehen*, in: *Logik des Bildlichen. Zur Kritik der ikonischen Vernunft*, eds. Martina Heßler and Dieter Mersch (Bielefeld 2009), pp. 94–123.

12 Birgit Schneider, *Operationalität und Optimieren. Einleitung*, in: *Diagrammatik-Reader. Grundlegende Texte aus Theorie und Geschichte*, eds. Birgit Schneider, Christoph Ernst and Jan Wöpking (Berlin 2016), pp. 182–183.

13 Jussi Parikka, *Operative Media Archaeology. Wolfgang Ernst's Materialist Media Diagrammatics*. *Theory, Culture & Society* 28/5 (2011): 52–74, here 62.

14 Ibid.

15 Aud Sissel Hoel, *Operative Images. Inroads to a New Paradigm of Media Theory*, in: *Image – Action – Space: Situating the Screen in Visual Practice*, eds. Luisa Feiersinger, Kathrin Friedrich and Moritz Queisner (Berlin 2018), pp. 11–27.

16 See Eder and Klonk (eds.), *Image Operations*.

17 Hoel, *Operative Images*, p. 27.

Operational images can be understood against this background of diagrammatics as a – each specific – combination of extrinsic and intrinsic operativity, which admittedly always also includes cognitive operations. Hence, also because of this role of concepts, which become effective and have consequences e.g., in the planning and implementation of automation, operativity according to Harun Farocki does not exclude human agency at all, which is of great importance for the context of interfaces (and also explains Trevor Paglen’s observation of “a kind of irony” in *Eye/Machine*). Operational images can, as Tom Holert puts it, “become components of a functional, technical environment that condition *more or less* automatic action and behavior”¹⁸.

But just as important than this – to a certain extent – technical level of distinction, for which also Volker Pantenburg’s systematic categories of operativity¹⁹ are helpful, is the explicitly political background of Harun Farocki’s work, which I would like to recall here. It precedes the obviously politically relevant examples of warfare, surveillance, and control that Farocki has worked on for many years and leads to his reading of Roland Barthes.

Operational/Political Language

About forty years before Harun Farocki turned to operational images in installations, films, and texts, he had addressed the operational language that Roland Barthes contrasted with mythical and thus depoliticized speech.²⁰ In two early reviews of Barthes’ *Mythologies* from 1965, the then 21 year old Farocki highlighted the political problem of the “constant confusion of nature and history,” the goal of “uncovering the manipulated, the mediated, where it is hidden and unrecognized,”²¹ and emphasized how Barthes countered mythic language as “form without content, as depoliticized statement”²² with the example of the woodcutter.²³

In *Dokumentarisch arbeiten*, Harun Farocki remembers – “I still have it in my head now” – Barthes’ argument: “He calls ‘opérateur’ the words that are not mythical. He asks: ‘Is there also language without myth?’, and says: ‘Yes, operational language.’ A woodcutter, he speaks the tree, he doesn’t speak about the tree; he doesn’t have this aesthetic distance in

18 Tom Holert and Felix Koltermann, *Bilder im Zeitalter des Drohnenkriegs*. *Wissenschaft & Frieden* 3 (2014): 30–33, here 30 (my emphasis).

19 See Volker Pantenburg, *Working Images*. Harun Farocki and the Operational Image, in: *Image Operations: Visual Media and Political Conflict*, eds. Jens Eder and Charlotte Klonk (Manchester 2017), pp. 49–62.

20 See Farocki, *Phantom Images*, pp. 17–18.

21 Harun Farocki, *Der tägliche Mythos*. *Spandauer Volksblatt* (May 16, 1965).

22 Harun Farocki, “Mythen des Alltags” von Roland Barthes, *SFB* (radio broadcast, May 26, 1965), typescript.

23 I would like to thank Volker Pantenburg for providing access to these texts.

which he speaks about it. That's actually what I'm concerned with here."

To speak of operativity and operational images (and sounds) in this sense, then, is not simply to employ a technical term here that serves to signify or define a new functional context. Instead, it has been a political concept from the outset, insofar as it explicitly (and perhaps in vain) attempts to make constellations visible, and thus potentially changeable, that repeatedly elude depoliticized language, our everyday myths, and the corresponding mythical terms (which today include, for example, "artificial intelligence,"²⁴ "the cloud,"²⁵ and no less "digital"²⁶).

It is above all working contexts that are at the center of both Harun Farocki's and Roland Barthes' considerations: As a "type of speech which is the opposite of myth," Barthes describes operational language, as a "political language" because it "represents nature for me only inasmuch as I am going to transform it, it is a language thanks to which I 'act the object'"²⁷.

In 1969, at the time and in the spirit of the West German student movement, Harun Farocki further underpinned this close interlocking of the political and the operational, following the Russian writer Sergei Tretyakov.²⁸ "The agitation film or any component of an agitation is operat-

ing [operierend]," Farocki writes, in order to then specify agitation and film according to his understanding of "operational" developed along Barthes.²⁹ Using the example of an "operating film" [operierender Film] about protests and demonstrations, he explains that such a film is "part of the operation of organizing a class." That is why "an operating film" can be judged by "the operation" of the protests, "by how they come about and by the significance of the operation in the class strategy." Farocki equates "operational" and "practical" in this context, while noting that the "theory of the operating film and the theory of operation are intertwined."³⁰ In accordance with a rather (and contemporary) actionist concept of politics, the theoretical work on "operating film" is thus also conceived here in agitational revolutionary terms.

Operating and Interfacing

This understanding of "political," which later becomes far more complex in Farocki's work, is of course highly ambivalent, especially from today's perspective – and at the same time instructive and helpful for considering processes and relations in computers, between computers, and to computers. If political is that which just

24 See AlgorithmWatch, *Automating Society* 2019.

25 See Tung-Hui Hu, *A Prehistory of the Cloud* (Cambridge, MA 2015).

26 See Jan Distelmeyer, *Critique of Digitality* (London 2022), pp. 11–33.

27 Roland Barthes, *Mythologies* (New York 1972), p. 146.

28 I would like to thank Tom Holert for this reference.

29 Harun Farocki, *Die Agitation verwissenschaftlichen und die Wissenschaft politisieren* (1969), in: *Harun Farocki. Meine Nächte mit den Linken. Texte 1964–1975. Schriften* vol. 3, ed. Volker Pantenburg (Berlin 2018), pp. 63–75, here 64.

30 Ibid.

makes an obvious material difference, which changes the world, which means a literally *incisive* intervention in e.g., what is called “nature” here, this is perhaps first and foremost a critique of the mythical. As here world-changing processes become manifest, while the myth (“hidden and unrecognized”, but no less effective) conceals them. At the same time, this traditional nature/culture dichotomy and hierarchy with clearly separated subjects and objects reveals a remarkable (and again ambivalent) hope for the political as something that recognizably intervenes as culture in nature and thus also may enable resistance to these perceptible forms of culture.³¹

Decades later, Farocki’s works on operational images show that this clear dichotomy can hardly be maintained.³² “Operational” now turns out to be characterized by mutual connections and interdependencies, which is why this politically motivated and complicating concept is so useful for opening up the diverse interface processes that are in use today on a planetary scale. This applies to all areas of computer use that rely on networking, to all platforms and Internet-based services anyway – and can thus be experienced every day at any time.

31 Perhaps it is precisely in this context that the “political, revolutionary potential” Barthes hoped for might have been so appealing to Harun Farocki as a “connection between politics, activism and transformation” (see Pantenburg, *Working Images*, p. 51).

32 This distinction proves to be problematic, not least for philosophical reasons (including the fact that culture and nature are not simply opposites) and for historical reasons (including the fact that the traces of the Anthropocene are everywhere today).

For example, my cognitive and physical operating with operational images on the home screen of my smartphone, or with operational sounds when using a smart speaker to start a Netflix series, presupposes and sets in motion a series of interface processes. In each case – both when touching on the operational image (the Netflix icon) in the smartphone grid to then make a selection in the menu (again, using operational images) as well as with the spoken command “Alexa, open Netflix!” or “Alexa, play *Tiger King* on Netflix!” (whereupon the completion is reported with the operational sound “Getting *Tiger King* from Netflix”) – several operations on the diverse levels of the “interface complex”³³ are necessary.

This here includes, *first*, interfaces between software and hardware, thanks to which “the universal machine” now proves to be “behaving as a specialized machine”³⁴, a Netflix machine. It includes, *secondly*, interfaces between hardware and hardware, which, for example, in the form of Internet undersea cables, are just as indispensable as, *thirdly*, interfaces between software and software that, for instance, as protocols establish and execute the rules of Internet data traffic. It includes, *fourthly*, interfaces between hardware and the world, which allow for input from outside via sensors such as touchscreens and microphones

33 See Distelmeyer, *Drawing Connections*, pp. 24–27.

34 Florian Cramer and Matthew Fuller, *Interface*, in: *Software Studies: A Lexicon*, ed. Matthew Fuller (Cambridge, MA 2008), pp. 149–152, here 149.

and, *fifthly*, interfaces between software and humans that (on monitors) convey operational images and (via loudspeakers) operational sounds enabling and confirming my interaction with the software. On this fifth level, humans interact and operate of course not only with machines, but always simultaneously with concepts (of usability, user and machines, among others); these operations are cognitive also in an ideological sense.

Correlations and Interdependencies

In (platform) processes like these, we are therefore never dealing with just one level of interfaces, but always with an interface complex.³⁵ The operativity that can be addressed here with the concepts of operational images and operational sounds along the lines of Farocki and Barthes is marked by correlations and interdependencies. It concerns both the operations of computers and the required infrastructures (to be understood as both material and processual, and thus as consuming resources, work, space and great deal of energy³⁶) as well

as human operations of dealing with them. This operativity – just like “the digital transformation” in general, even if it aims at technological autonomy – is never purely technical-apparative, never purely automatic or machine-based. Because human interests, conceptions, selections, agendas, activities (from apparatus engineering to click-working to manual waste recycling) and responsibilities are always part of it.

The political dimension of operativity that Harun Farocki developed with Roland Barthes can perhaps be turned and used in this way for the operational images and sounds of the interface complex:

To consider and address them as operational should inevitably lead to the question of which operations and which interface processes are actually involved.³⁷ Which and whose forms of labor and agency, which conceptions (e.g., of technology), which changes to societies and the planet, which interdependencies are claimed and run, in part, as Farocki put it, “hidden and unrecognized”? How do my operations relate both to those of other people (who program, maintain and scrap devices, mine rare earths, lay and repair cables, send satellites into orbit, etc.) and to the operations of infrastructures and automated computing processes? How do they relate to the operational interventions in the existence of human and other life forms of this

35 See also Kate Crawford and Vladan Joler, *Anatomy of an AI System: The Amazon Echo as an anatomical map of human labor, data and planetary resources*. *AI Now Institute and Share Lab*, September 7, 2018, <https://anatomyof.ai>, access: September 14, 2022.

36 See Lisa Parks and Nicole Starosielski (eds.), *Signal Traffic: Critical Studies of Media Infrastructures* (Urbana 2015).

37 It seems to me that the shift recently announced by Jussi Parikka (from discussion of the image to questions of operations) is aimed in a similar direction. See <https://jussiparikka.net/category/operational-image/>, access: September 14, 2022.

planet, which may be part of the “digital transformation” as sufferers (e.g., as cut trees)? And how do the operations of automated processes, such as algorithmic decision making, influence/facilitate/determine the lives of individuals as well as societies and states that rely on them, e.g., for stock market trading, caregiving, and warfare?

One small part of the reciprocities of this global operational business was pointed out by Laura U. Marks with a Netflix example during the 2020 COVID-19 pandemic. She “calculated the carbon footprint of the wildly popular Netflix miniseries *Tiger King*, which streamed 34,000,000 times in the United States in the last ten days of March 2020”. The total energy spent on this, according to Marks, was “the same as the electrical consumption of Rwanda in 2016”.³⁸

It is operational coherencies and interdependencies like these that can come into view when the notion of operational images and sounds is not used in a purely technical connotation, but as a challenge to ask about correlations that are political in more than one way. Political here are not only the much-discussed effects on individuals and societies, on new economies and power relations, but also the executed/acting conceptions of a certain operativity and all the human and more-than-human elements utilized for this purpose. To put it differently in

the words of Roland Barthes, it is thus a matter of going on a search for how our operations with operational images and sounds *act the world*.

38 Laura U. Marks, Streaming video, a link between pandemic and climate crisis, *Rosa Mercedes 2* (April 16th, 2020), <https://www.harun-farocki-institut.org/en/2020/04/16/streaming-video-a-link-between-pandemic-and-climate-crisis-journal-of-visual-culture-hafi-2/>, access: September 14, 2022.

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