Alexander R. Galloway and
Bernard Dionysius Geoghegan

Shaky Distinctions: A Dialogue on the Digital and the Analog

Upon reading Bernard Dionysius Geoghegan's 2019 essay "An Ecology of Operations: Vigilance, Radar, and the Birth of the Computer Screen," I ended up having an extended email dialogue with the author, which has been condensed and edited here.[1] *What struck me most about Geoghegan's essay was a fundamental question: Are computers a visual medium, like cinema or photography, or are computers better understood in nonvisual terms? While a term like "surveillance" evokes visual metaphors of watching and monitoring within computational capitalism, what if digital media operate more through "capture" and other nonvisual metaphors, as Phil Agre has argued?*[2]

Geoghegan and I began by discussing the relation between computation and visuality, but it soon became clear that we had very different positions on the nature of the digital and the analog. The conversation turned toward a slightly different set of questions: What is the digital? What is the analog? Both terms appear elementary at the outset. Yet they turn out to be teeming with technical and philosophical nuance. Conventionally speaking, digital technologies represent the world via discrete units, while analog technologies operate through continuous variation. At the same time, discrete and continuous techniques are some of the oldest in human culture, evident in poetry, music, metaphysics, politics, and many other areas. So do the narrow definitions of digital and analog tech also migrate into domains like aesthetics and philosophy? Would a digital aesthetics follow the principle of discrete units? Would a digital philosophy be discrete as well? And what would that mean in practice?

Digital devices are ubiquitous in contemporary life, yet, as this dialog reveals, some of the most basic questions of the digital age have yet to be answered.

– Alexander R. Galloway

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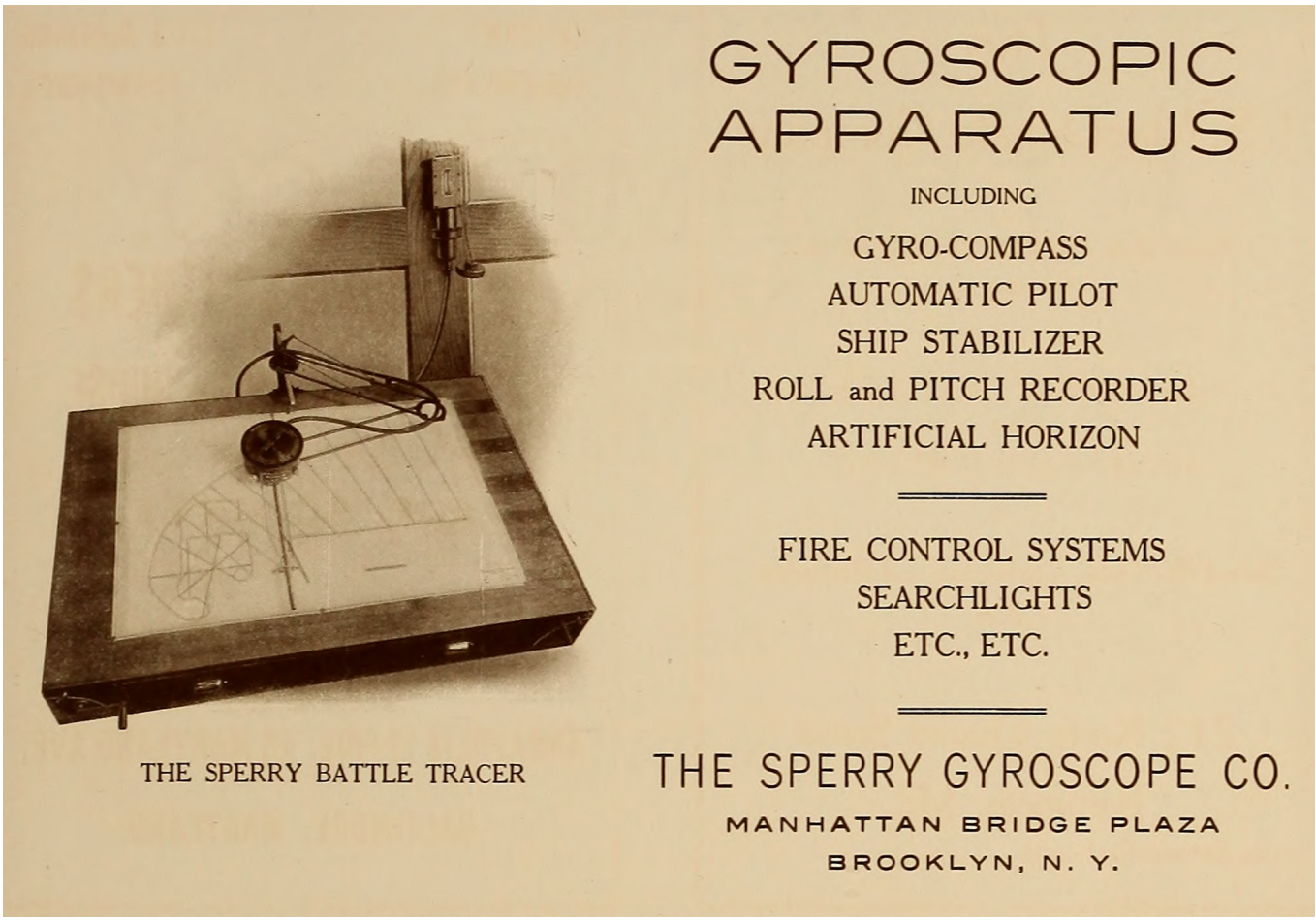
Alexander R. Galloway: I was fascinated by your essay on the historical entanglement between computers and screens, or computers and visuality more generally. I was always seduced by Friedrich Kittler's now notorious claim that "computers … are not designed for image-processing at all."[3] Still, the question of vision and visuality is a difficult one. I would agree that digital computers are essentially *spatial* in the sense of divisions within space: arrays, sets, grids, registers, cells, pixels, etc. But does that mean computers are inherently screen-based or visual? I'm not so sure. Particularly since computer "images" are so frequently deployed for nonvisual or non-screenic uses. I wonder how this debate would change if we were to talk about analog screens



Possibly the earliest real-time computational imaging device, the World War I–era Sperry Battle Tracer. Data synthesized from across a battleship sketched a real-time image of the battlefield, including location and trajectory of the ship and its foe. Source: *The Lucky Bag: The Annual Brigade of Midshipmen 23*, ed. the Class of 1916 (AH Sickler Company, 1916), 483.

versus pixel-based screens.

Bernard Dionysius Geoghegan: Thanks for your kind words. I don't think I would say computers are inherently screen-based or visual, but rather that:

• There are no stable and well-defined criteria for defining the digital as essentially nonvisual. That is, one can't extricate visuality and screening from the digital. One can identify certain digital devices that are nonvisual but the grounds for privileging them as the essence of the digital are arbitrary. And if one thinks networked computing is of any importance in how we understand the digital, then excluding screens, screening, and visuality from the digital verges on the nonsensical.

• All attempts to define the digital and computing as essentially nonvisual media rely on shaky distinctions between calculation, wherein the computer is essentially a calculating device, and information processing, a much wider domain which often entails human users and interfaces. (I don't think I really get into this in the essay, but it's probably a loose thread where one could really yank on my argument to see how far it holds. Kittler would probably dismiss information processing as nonessential or supplemental, but I think that's because he has an impoverished notion of the digital.)

• Accounts of the computer as nonvisual or devoid of screening overlook longer histories of the computer as a control mechanism. Inspired by writers like Otto Mayr, James Beniger, Sharon Ghamiri-Tabrizi, David Mindell, and Nina Franz, who have considered control issues, I'm interested in underscoring how digitality, control, and interfacing are irremediably intertwined.

In this sense, the goal of my paper was to reconstruct one line of the history of computing – that is, the birth of the computer screen from radar, fire control, and vigilance – that illuminates how central interfaces and visuality work in today's networked digital media. Unless one thinks fire control is an incidental problem in the history of computing, which is to say associated work by the likes of Wiener, Shannon, and von Neumann are entirely contingent, it seems to me that visuality and screening can't be easily dismissed as nonessential to computing.

As for your remark about analog vs. pixel-based screens, while there's a tradition of media history taking for granted that these kinds of distinctions are fundamental, I'd put less weight on that distinction. First, in the 1960s and '70s, both kinds of screens existed in similar ecologies that diminished the importance of that particular material embodiment in practice. Second, I'd follow Flusser in noting that cathode-ray tubes and pixel screens belong to a single genealogy of technical images assembled from molecules, such that the opposition between the two is easily overblown.

It's in the spirit of these two points that I write a history that cuts across analog and pixel screens, wherein they participate in common screening, interfacing, and visualizing roles in computational systems. Early radar systems join together digital computation, electronics, and analog resolution in one feedback loop. These systems established and integrated the kind of digital systems that we know today, i.e., networked, with magnetic memory and real-time processing, and these innovations derive from their screening and visualization activities. Considering how foundational these systems and technologies are to the digital as we know it, I find arguments that the digital is essentially nonvisual to be tendentious at best.

Which leads me back to some earlier remarks you made about seeking a "digital solution to the digital." I find such a project exciting, alluring, provocative, but it also seems to me that such a presentation dreams of a mythical digital essence. I'm arguing that the digital, or at least the "actually existing digital," is a hybrid or mixed medium. And that attempts to define the digital in terms of the digital involve some kind of ideologically suspect exclusion or metaphysical obfuscation.

Kittler is, as always, useful, because he's so polemical and radical in his analysis. If one were to undertake a more detailed analysis, I think one would find that Kittler's project to expel bodies, images, etc., from within the digital, and his attempts to trace computing and European culture to a common Greek origin, fit within a common system of purification (his much noted "*Austreibung*") that – while it may have a distinguished pedigree in some European and German intellectual traditions – is ultimately a kind of logocentric, ethnocentric, masculinist myth-making.

ARG: Let me focus on some of your terminology. You said "shaky distinctions," "no stable and well-defined criteria," and "hybrid or mixed." I don't discount any of this per se. Yet aren't the notions of "shaky" or "hybrid" drawn from the analog tradition rather than the digital? In my understanding, there is nothing like a shaky definition in digital tech or digital philosophy. There is no hybridity in arithmetic (which I consider the base tech behind digitality). I'm thinking, for instance, of Euclid's definition of arithmetic in book 7 of the *Elements*. The phrases you are using are analog *departures* from digitality, not digitality itself. Or perhaps irrational departures; and I mean irrational in the technical/mathematical sense of "having no ratio." (Hence one might find such things filed under *alogos* or *analogos*, but not under

Early digital imaging systems, such as the SAGE missile defense system of the 1960s, layered digital, video, analog, and other modes, to better incorporate human sensoria into detection. These feedback-driven systems laid foundations for modern digital imaging systems that rely on the constant relay between human and machine, wetware and hardware. As a general rule, images surfaced at the juncture between two types of the system – even here, when the relay was effectively from an analog CRT to photoelectric digital processing. Source: "Pushbutton Defense for Air War," *Life* 42, no. 6 (1957).

logos/digitality proper.) If you can show me a shaky distinction in Euclid, or Leibniz, or Dedekind, or Peano, or Frege, I'm willing to look. But in my study of it, digitality is a form of representation in which such indistinctions are categorically excluded. Digitality is practically a synonym for "stable and well-defined criteria"!

Of course, not everyone agrees. Beatrice Fazi departs from this – Luciana Parisi as well – via reference to Gödel and the kind of paradox/limit paradigm that gains adherents in the twentieth century. But that's a whole different story. In fact, I don't think Gödel et al. dethroned arithmetic and logic very much from their classical renderings.

BDG: There's a kind of elision here characteristic of folks trying to formulate some kind of digital ontology. The problem, as I see it, is this: claims for the digitality of the digital often proceed by declarative statements or fiat, rather than actual analysis. When you push these claims much, or probe into the place where they define the digitality of the digital, all kinds of ad hoc exceptions, exclusions, and bracketing crop up that call into question the digitality of the digital.

In other words, your claim sounds tautological. I say: Well, the grounds of strictly digital ontologies that exclude bodies, images, interfaces, and so forth are not really firm, and they are obfuscating the hybrid conditions of their existence. And in a somewhat modest case study of radar, I demonstrate an instance of how this worked out, with implications for contemporary social media. Your response is: Well, that doesn't count, you're using analog terms to define the digital, the digital should be defined in terms of the digital. And I say: Yes, but "the digital" in this case rests on an infrastructure of conceptual, technical, procedural elements that cannot be separated from bodies, technique, interfaces, and so forth. To which you respond: Yes, but those aren't digital terms, digital philosophy doesn't reference those terms. Which is why I say: Yes, this is why I think digital ontologies, at least in media theory, are obfuscating – they exclude their own conditions of existence from analysis.

As a thought exercise, sure, let's see how far we can take a digital ontology, digital philosophy – and what payoff it gets. But as I understand it, these kinds of theorists are advocating a much more radical distinction between analog and digital than merely a thought exercise.

ARG: I suspect we don't really disagree on the specifics, even if we are interpreting them in very different ways. Perhaps I'm ultimately more of a structuralist, while you are more of an empiricist. For instance, you say "fiat," and I would agree completely. In fact, I frequently refer to digitality as a "decision." The digital is the paradigm in which fiat makes sense – absolutely! Which for you, I think, means it's illegitimate or illusory. Whereas I would say: no, fiats are real. I'm thinking of Carl Schmitt's definition of the sovereign as the one who decides. We can say "sovereignty is illegitimate," of course, but that won't necessarily stop the sovereign from exercising power. And it won't help us understand what sovereignty is.

If you were to ask me whether the world is analog, I might assent. Or at least posit the digital and the analog as coequal. It's a tricky dance, but I typically say that the analog is "on the side of the real." (The problem is that equating analog with real leads quickly to a Romanticist trap; yet the analog is the only paradigm in which something like the real makes sense. Thus "on the side of the real" is my compromise position.) So, yes, "digital" media are reducible to weird analog waves and signal fluctuations. I freely admit that. Still, if that's the whole story, then you'd have to essentially say that "the digital doesn't exist" or, as Kittler put it, "there is no software." Whereas I want to acknowledge that the digital *does* exist. Contra Kittler, there *is* software. The digital is certainly a construction, a decision, an abstraction, a "fake" – that's all true. But you could say the same for patriarchy or Western metaphysics or capitalism or the money form. For me the symbolic exists and is real. And, yes, one can write about the realness of a symbolic order without being an evangelist (e.g., Marx's *Capital*).

My position is vulnerable to charges of ahistoricism, as structuralist positions tend to be. This is a conscious decision. Why? Because digitality is not a paradigm in which history makes sense. Digitality says: I am not temporal, I am outside history. I respond by saying: okay, let's try to understand digitality without using concepts like history or time. And note that I'm doing this as a Marxist, for whom history is a sacrosanct category of analysis! Nevertheless, I want to know the digital as it is before formulating a response to it.

Regarding language like "obfuscating," "tautology," or "excluding" – I agree that those are cultural techniques within digitality. For instance, arithmetic is a technique based on decision or cutting, which establishes an identity. (And the identity is defined tautologically; Euclid says that a monad is whatever is "one." Hence tautology is a feature of digitality, not a bug.) This is followed by the exclusion of "analog" magnitudes that don't map onto "rational" ratios of the monad, the most famous being root two and pi. Again, I take arithmetic to be the most important digital technique. So perhaps I'm not being ahistorical

so much as macro-historical. Digitality has been with us for a very long time.

BDG: I'll note in passing two features of the sovereign decision you allude to. First, it takes place *in mixed and unstable conditions*; its force and identity are part of those conditions. Perhaps I'm more interested in highlighting that dependence on conditions. Second, thinking with Heidegger, a decision constitutes a leap, in a situation that is undecidable. It is, partly but necessarily, incalculable. In view of these two points, is it fair to say that you have set up an analysis where the totally calculable, the nonambiguous, the nonarbitrary, the stable, and so forth, finds its conditions of possibility in a leap that is non-calculable, ambiguous, and unstable?

ARG: Yes, although I'm filtering it all through Badiou who says nearly the same thing: a leap over the abyss; a nonrational choice to overcome rationality; the calculable and the noncalculable. This is why I tend to label Badiou a digital philosopher, even though he has very little to say about computers, the internet, or other examples of actually existing digitality. Incidentally, I was just reading Sybille Krämer and this jumped out: "Machines have no eyes. If we have to reconstruct a machine's sensitivity it is the tactile, not the visual that matters."[4] This seems right to me. Computers "sense," they don't see. Thus her metaphor of tactility. And they sense in a very particular way, that is, via interfaces pre-codified into a symbolic capture language.

With this in mind, how do you account for all the non-screen interfaces in, say, an iPhone? For instance an iPhone has two digital cameras (sometimes more), several kinds of nonoptical sensors (acceleration, proximity), four network interfaces that I know of (Wi-Fi, cell, Bluetooth, GPS), at least one microphone, speakers, several buttons, and so forth. Why is the screen the most important interface? If I had to pick, I'd say the network interface(s) are the most important – although, in truth, they all are.

BDG: I don't think I argue that the screen or vision is the most important interface, only that it can't be radically excluded as nonessential to the digital as we know it. Insofar as vision is a privileged case for thinking about computers, it is not in terms of its essential importance to the computer but rather because:

1. Vision and screens are the site of a canonical argument about computing (that I think deserves debunking). There's a long and interesting history of people kicking off essays and books by saying that computers can't sense and that their interfaces are nonessential. The privileged example for media theory is vision, and with it a presumption (it's not even articulate enough to be a claim) that one can radically distinguish between the computer and the human, between "calculation" in the machine and varied modes of information processing sustained by human users. So I'm poking at what I think are the holes in that conceptual framework, and the impoverished ontology of the digital on which I think it's based. This is not all explicit in my essay, I suspect.

2. In light of some of the above, I think that "vision" and visual interfaces are a key conceptual site for decentering accounts of machines in general, for bringing interfaces, information processing, and ultimately a lot of weirder stuff like anxiety, threat, and crisis (I'm taking cues from Wendy Chun and Mary Ann Doane here[5]) forward as constitutive of "the digital."

Just for clarity, I don't mean to say that analog elements complement and sustain the digital. I maintain that the analog/digital distinction itself is an after-the-fact illusion that doesn't actually obtain in digital media outside certain exceptional and hypothetical machines. Not only are the setups I'm interested in not strictly digital; they're not well described as "analog" and "digital" either.

ARG: Is Krämer just repeating Kittler's position?

BDG: Maybe. But I think if we really dug into it, the Kittler position is repeating something else that already shows up in longstanding iconoclastic, anti-imagistic thinking that opposes purer higher forms to fallen, debased spectacles. This shows up in Wiener, for example, in his fear of the Golem and his hatred of gadgets. Kittler's success is repackaging that line of thinking in dynamite-discourse and extraordinary constellations (some of which, like his preoccupation with war, I'm quite indebted to and even elaborate on in my "critique" of his position). He's not the originator of the position, but an extremely important mediator and relay in its propagation.

Earlier you said that the difference between our two perspectives lay in the fact that I am, in your words, an "empiricist." I think there is a conceptual difference here, but I'm not sure that's where it is exactly.

ARG: I was thinking about frames – digital as frame – and the way in which a frame always entails a concept.

BDG: I'm more interested when claims emphasize the limits of a given frame (as when Heidegger or Derrida situate cybernetics within the limits of a certain tradition of European metaphysics) or the need to uncover how oppositions depend on one another (Foucault's pairing of madness and reason, for example). That provides models for how I want to question the analog/digital opposition. I'm less persuaded

by the Kittlerian approach that seems in the 1980s and '90s to depend on breaks and ruptures to define the radical specificity of media, then as he got older and more nostalgic in the 2000s, to turn to idealized Greek origins to set off the specificity of key scientific and technical phenomena.

ARG: I wouldn't disagree. But just so that we're clear, "inadequacy of frame" is precisely something that digitality can't abide, since digitality, in my version of it, is little more than *framing* writ large. So while I'm also attracted to Foucault, etc., I don't feel like it's a faithful portrayal of the subject matter. Or at least I want to define the digital on its own terms first before it gets dismantled.

BDG: Framing sustains itself through a lot of exclusions and oppositions.

ARG: Well yes, but mine is also explicitly an *attempt to theorize exclusion* by defining digitality via framing/cutting/decision, etc. In other words, I could turn the question back on you: How can you think exclusion? (Which is why, while I've frequently been a digital critic, I now call for a return to the digital in the name of the political.)

BDG: I'd suggest a different framing question: You identify the digital with the symbolic. If so, then I'd ask: Is an analogy a symbolic relation? What about analog representations, are they symbolic? For that matter, can one have either analogy or analog without some notion of the two, i.e., a cut or division that defines the relation of an analog to its "original" or that which it analogizes? Why insist on their radical heterogeneity to a realm of digital symbolism and cuts?

ARG: I'm just parroting kitsch Deleuzianism, or my version of it. One of the reasons I like Deleuze is that he's able to show a universe built from radical difference and heterogeneity where symbolic infrastructures don't matter, or at least aren't primary. (Yes he wrote about language in books like *The Logic of Sense*, but only to show that language is a secondary effect of a more primary mode of differentiation – the play of nonsense.) There are many examples. So the modern subject is not a rational ego but a "fold," which is to say a curvy wave, not birthed directly from language or the symbolic order. Again, many examples in Deleuze. Or maybe you have a different interpretation? Mine is admittedly idiosyncratic, but hopefully still defendable.

I've wrestled with the relation between analog and analogy. I want to show that there's a reason why the two are similar, that it's not just a terminological coincidence. This is one reason why I like the "general formula $a/b = c/d$" adopted from Euclid.[6] Of course "$a/b = c/d$" is also a textbook definition of analogy: "a is to b, as c is to d." It's not unreasonable to adopt similar language when describing analog media in operation. As with the *camera obscura* – an analog device – the proportions of the little image are "analogous" to the proportions of the external natural world reflected in the image.

BDG: Your fascinating remark also highlights a tension, perhaps even a contradiction, in how you're contrasting the (nonsymbolic continuous) analog and the (symbolic and discrete) digital. It seems to me that "$a/b = c/d$", i.e., your account of the analog, is itself a symbolic relation. It seems to me that "$a/b = c/d$" involves a relation among discrete elements defined by binary cuts. I don't think it's an insurmountable obstacle, but I think a very particular analytical layout is needed to make your disposition of claims maximally effective. I mean, maybe the question is this: Is there any system of analog representation that does not embody some principle of a cut or division between the representing material and the represented?

ARG: Again, a difficult and nuanced issue that I'm still struggling with. I've come to think in terms of a kind of "minimal" or "pro forma" digitality (let's call it Digitality I) that happens "first" – structurally first if not actually. This is a form of digitality generated by any sort of distinction whatsoever. Thus, any kind of cut, any decision, any act of 1→2 is at least *minimally* digital. So, yes, even analog structures would have this kind of minimal digitality, to the extent that there's a twoness at play – echoes, mirror images, and so forth are minimally digital in this sense, even if echoes and mirrors are some of the most paradigmatically analog phenomena. Then, beyond that, there's full-fledged digitality (a.k.a. Digitality II) defined via a discrete symbolic alphabet. At this point the analog parts ways; there's no discrete symbolic alphabet spanning both sides of a transductive interface, for example. My vocal cords vibrate, making the air vibrate; but there's no "cord symbol" or "cord atom" that spans the gap, turning into an "air symbol." Again, this is just kitsch Deleuzianism.

BDG: Wouldn't you agree that many if not most "analog" instruments are simultaneously analog and digital?

ARG: I find it useful to accentuate the discontinuity for pedagogical reasons. But yes, most if not all actually existing media technologies are mixtures. Further, "purely" analog phenomena tend to invert and generate digital effects, and vice versa. My favorite example is the wave, a seemingly "pure" analog phenomenon that nevertheless has peaks and troughs and thus digitizes itself into discrete cycles and wavelengths.

BDG: Perhaps our inquiries in fact align, at

least insofar as we're both concerned with the implications of a certain copresence of ostensibly analog and digital elements. I guess the question then becomes how to deal with inversions, exclusions, paradoxes. Insofar as you're interested in policing a certain opposition between analog and digital, even in the face of actual intermixing, would it be fair to say that your definition is more or less a kind of idealism? One that does not find embodiment in real artifacts?

ARG: Not to be cagey, but *all* definitions are "a kind of idealism." Such is the curse of the name, the law, the definition. And yes, the digital too. This is why I have argued in the past that digitality tends toward the transcendental. But this goes back to our basic disagreement: it seems like you don't want to acknowledge the existence of names, laws, definitions, and symbols, whereas I do.

BDG: I'd approach this a little differently. I would not be inclined to frame definitions as "idealism" – the -ism in particular seems unwarranted – but rather as "abstractions." Semantics maybe. But more to the point, I'm not sure if your privileged examples of analog media are representative of class overall. A definition of a chair should feature a few of the most common and enduring features of chairs, even if it can't account for a great many of specific chairs. Your definitions of the analog tend to exclude many of the most common and enduring features of analog media, i.e., the telegraph, cinema, photography, and so on, which all enlist cuts and symbolic elements in their means of production. What does a purified philosophical account of the digital or the analog bring us if it can't come to terms with actually existing digital and analog technologies?

ARG: Let me be clear. I'm not evangelizing in favor of the digital. I'm not saying these technologies bring us anything. My many criticisms of the digital are already on the record. But if you're saying that our theory of the digital should be an analog theory, that seems inappropriate to me. Or at least methodologically mismatched. No, let me rephrase: I'm totally happy to have analog theories of the digital – yours, others, and so forth. My contribution is merely to offer a digital definition of the digital. The digital definition can sit happily alongside the analog definition.

BDG: I'm not arguing for an analog theory, I'm arguing for a mixed and heterogeneous theory. W. J. T. Mitchell was right: all media are mixed media.[7] You've said in another email that you're increasingly convinced that the digital needs to be fought for on the grounds of the digital. What I'm saying is that the grounds of the digital is mixed: analog-digital. Another way of getting at the mixed characteristics of analog and digital is to look at the variability in their definitions. Often people speak in terms of continuous and discrete, but Wiener interestingly suggested that the terms "analog" and "digital" should be replaced with the terms "measuring" and "counting." These are not unrelated to familiar analog/digital oppositions but they're not quite identical either. And I think they might be used to scramble familiar oppositions between the two.

ARG: Yes, most certainly. The analog synchronizes with geometric "magnitude," while the digital with arithmetic "number." There are things you can do with a compass and string, namely you can measure, mark out spaces, draw figures, etc. And there are other things you can do with discrete units, such as count things with them. Which doesn't necessarily conflict with scholars who write about the "historical construction of the kilogram" and so on. And the "root" of digital systems might peter out into some sort of ultimately undefinable analogicity, depending on who you ask. It seems to me there's a class of media history and science and technology studies that is fixated on the contingencies of this or that particular material embodiment and its social meaning (see Emanuele Lugli's *The Making of Measure and the Promise of Sameness* for a recent example). Why is the kilogram this hunk of brass and not another hunk of brass a few molecules heavier? My response to the social constructionists is basically: yes, this will tell us a lot about society, but it won't tell us very much about the metric system! And while I'm most definitely a materialist at the end of the day, my particular obsession here is about exploring the specificity of the digital on its own terms. In other words, is it helpful to show that integers are a social construction? Okay, sure, everything is a social construction. In the end that doesn't tell us much about the integers. Except maybe that "they don't exist" or that "they're an epiphenomenon of social systems."

BDG: Regarding the limits of defining the apparatus and its social construction, it's an interesting problem. I mean, part of the point of my turning towards "radar systems" (the first use of the term "system engineering" is in the context of radar design) is – as I suggest above – to get beyond the significance of specific material embodiments, such that the material difference between the analog and pixel-based screens are subordinated within the ecological and symbolic properties of the system. And yet, Latour – the Foucault and Agamben of "*dispositif*" – has encouraged a strain of critical media studies to focus on the embodying apparatus and its analog foundations. Yet, as

Latour himself has emphasized in recent years, his goal was not to argue that scientific knowledge is reducible or identical to its apparatus – hence the need for some science studies scholars to clarify that climate change is not identical with its apparatus of analysis, representation, etc.

I think part of Paul Edwards's intervention in his book *A Vast Machine* was to showcase the global digital apparatus of climate analysis, while also arguing that it comprises a modeling system with a certain accuracy irreducible to this or that substratum, something that overcomes (or perhaps sublates) its "mixed" foundations: from instable multiplicity, a stable and reliable symbolic system emerges. I fear that some champions of the apparatus and the peculiarity of its material substratum have overlooked the ability of a media system to actually develop the kind of internal consistency that I think you identify with "analog" and "digital." So would it be fair to say that you're arguing that a philosophy of the digital acknowledges the underlying apparatus, but then showcases the internal and immanent symbolic relations peculiar to the (digital) system?

ARG: But isn't arithmetic an apparatus as well? I want to pursue a structuralist theory of the digital because the essence of the digital is precisely *in it being a structure*. Perverse, I know, but it's within structuralism that one can make these kinds of seemingly outlandish ahistorical and dematerialized claims, claims that I'm happy to make and that you are resisting. For instance, Althusser said things like "ideology has no history" and "ideology is eternal." It's possible to understand why he said those things, and it's possible to be convinced by them, despite the claims seeming to be so demonstrably false. I want to make categorically similar claims about digitality. By "categorically similar," I mean in the same structuralist register, rather than in, say, a historicist register, an empirical register, or some other register.

Can one reduce the digital to an analog apparatus? Of course. There are endless clumsy ways to reduce mind to body and body to mind. I am contesting whether we *ought* to make such a reduction. And if we ought not, then historicism and empiricism shouldn't be primary methods in digital studies. Anathema, I know, but that's why it's important to scrutinize methodology.

BDG: "Always dehistoricize," perhaps – not as a dogma to celebrate, but as a tactic to momentarily inhabit its ratio, en route to uncovering others?

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Alexander R. Galloway is author, most recently, of *Uncomputable: Play and Politics in the Long Digital Age* (2021).

Bernard Dionysius Geoghegan's book *From Information Theory to French Theory* is forthcoming from Duke University Press. His other writings on screens and imagery include the essay "The Bitmap is the Territory," forthcoming in the journal *MLN*, and his recent essay "Screen," coauthored with Francesco Casetti and published in *Information*, ed. Michele Kennerly, Samuel Frederick, and Jonathan E. Abel (Columbia Universty Press, 2021).

1
Bernard Dionysius Geoghegan, "An Ecology of Operations: Vigilance, Radar, and the Birth of the Computer Screen," *Representations* 147, no. 1 (2019): 59–95.

2
Philip E. Agre, "Surveillance and Capture: Two Models of Privacy," *Information Society* 10, no. 2 (April–June 1994): 101–27.

3
Friedrich Kittler, *Optical Media* (Polity, 2009), 226.

4
Sybille Krämer, "Was Dedeutet 'Digitalisierung'?" (What Does "Digitization" Mean?) (presentation, "Beyond Technology: Perspectives of International Media Philosophy" workshop, Berlin, October 26, 2019).

5
See Mary Anne Doane, "Information, Crisis, Catastrophe," in *New Media, Old Media: A History and Theory Reader*, ed. Wendy Hui Kyong Chun and Thomas Keenan (Routledge, 2006); Wendy Hui Kyong Chun, "Crisis, Crisis, Crisis, or Sovereignty and Networks," *Theory, Culture & Society* 28, no. 6 (November 2011): 91–112.

6
See http://cultureandcommunication.org/galloway/general-formula-for-the-digital-and-the-analog.

7
W. J. T. Mitchell, "There Are No Visual Media," *Journal of Visual Culture* 4, no. 2 (August 2005): 257–66.