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## Informatic Labor in the Age of Computational Capital

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### Image-Code-Financialization

With the undeniable rise of variants of fascism in the United States and around the world, an up to date account of the logistics of antidemocratic mediations is urgent. Here (as everywhere) I take it as axiomatic that capitalism and democracy are structurally contradictory—“capitalist democracy” and “democratic capitalism” are in fact oxymorons. The strategic management of that contradiction by a system dedicated to conserving class power leads to what Walter Benjamin famously identified as the aestheticization of politics, or what Orwell understood as a short-circuiting of thought, and what today we might be calling “the politics of affect,” a term that among other things would indicate a schism—and thus a mediation—between individual experience and systemic rationale. By means of aestheticization and the preservation/re-invention of ritual (cult) values, Benjamin told us, the masses are granted “not their right but instead a chance to represent themselves.”<sup>1</sup> Since the 1930s, the Führer cult and the celebrity, as both artifact and means of expropriation have obviously “evolved,” even as they provided the shape of things to come in what now appears as a kind of fractalization of celebrity. Fractal variants would include fundamentalisms from that of ISIS to Tea Partiers; other racist nationalisms like Golden Dawn in Greece, Le Pen in France, and Trump in the US; the branded conversions of persons and objects into franchises; as well as many state nationalisms including (but unfortunately not limited to) those of France, China, Israel, and the US. Such opportunistic occasions for representation—in which individuals, icons, scapegoats and flags serve at once to figure collective authority and as points of narcissistic subjectification and phallic compensation, separated from any ability to transform hierarchical property relations—exist necessarily, through the suppression, that is, the unrepresentation and unrepresentability of others. The non-representation of most of us in these racializing and gendering iconographies that, in the last instance, are written on our bodies and indeed every body, is a condition of possibility for both the leveraged accumulation of private property and the star-commodity and provides a lingua franca for political struggle enframed by a capitalist imaginary. Here writing means the practical subjugation of peoples to meet the exigencies of hierarchical structures of representation—Debord’s spectacle in binary code. Thus, symptoms of such suppression include not only the celebrity form (the authoritarian personality and its fractal multiplications on, for example, Instagram, who exist through the accumulation of our attention), but the various and dynamically evolving racisms, sexism, and nationalisms, with their circulating, prejudices, hatreds and phobias.<sup>2</sup> The plurality of fascisms represents, quite literally if not quite intelligibly, the mutual competition at multiple scales among the many capitals.

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The cultural field, as Marxists, feminists, anticolonialists, anti-racists, queer activists, radical filmmakers, poets, activists, and many others have long recognized (despite our significant and often problematic differences) is also a battlefield. Since Benjamin, and with the passage through what was called “postmodernism” (a periodization that retrospectively can be understood to have marked the real subsumption of the cultural by the economic), we have learned to understand culture not merely as a medium of politics, but as a means of socio-economic production and reproduction as well as of potentially radical transformation. Here I have in mind a broad range of phenomenon informed by radical imaginaries, found nearly everywhere we people seek freedom in cultural pursuits: from its trace presences in fan détournement in places like “An Archive of Our Own” to its concerted concentrations in a socio-critical work like Allen Feldman’s *Archives of the Insensible* with its indefatigable critique of “dismediation,” “apophatic blurring,” and metaphysics as a medium of war.<sup>3</sup> The forms of counter-culture are, of course, myriad, and every sentence made for this essay owes a debt to an infinity of struggle—I mention the archive because it indicates a topos for this struggle in addition to the more familiar notions of literature, cinema, ideology, etc.

The new situation of culture as means of production (and here we should probably say “cultures,” even though, given the situation, inclusivity is the last thing some of us want) is that it has been largely functionalized by political economy. This historical repositioning of culture as on a continuum with the shop floor and the factory is an economic and technical result and raises the question of a technics of fascism as a technics of computation, or of what I call “computational capital.” While it is usually understood that culture has a relation to economics and technology, what remains less well understood is the degree to which, from a hegemonic standpoint, culture has become a technical and economic relation. Cultural practices are posited and presupposed as productive for a capitalism that was, in hindsight, itself already a computer (Digital Culture 1.0) and that today requires discrete state machines (Digital Culture 2.0) for its profitable and intensifying operations by which qualities are transformed into quantities. The rise of visual culture during the twentieth century, and the re-organization of the life world by that interface called the screen along with the calculus of the image, was a requisite step in the financialization of culture and its real subsumption by capital. The succeeding phase, for which digital culture (2.0) serves as both consequence and pre-requisite, marks a heavy investment in the extension of quantitative logics into the micro- and nano-logical operations of the formerly analogue endeavors—all of which, including language, images, aesthetic form, philosophy, spirituality, the imagination and the like, fell under the auspices of the now defunct humanities and are today rigorously and almost inexorably submitted to background monetization.

This financialization of culture, as we shall see, requires the informationalization of social practice, indeed, of the social metabolism. Managed by means of screens, information flows from users (and the used) to capital in a pattern that can be described by the sequence Image-Code-Financialization. If it can be said that fascism and/or other contemporary antidemocratic state-formations legitimating hierarchizing modes of production depend upon leveraged value extraction, and that much if not all of that value passes through/as data and its organized transmission (number of hours worked, links clicked, pages viewed, money banked), then data flow disruption or redistribution—though tremendously varied and relatively unexplored through the lens of a critique of political economy—presents key tactics and perhaps strategies in an anti-fascist praxis. The flow of information-value up the value chain does not trickle back down in equal amount either to populism’s mass participants or really to most content providers. I want here to give a set of examples of partial or successful data-flow disruptions, but more pointedly to conceptualize forms of potential intervention through data disruption by

analytically parsing the micro-dynamics of images and screens—and the practices they organize. Understanding the emergent relationships between image, code and discourse/culture/profit effectively exposes sites and possibly means by which to interrupt the expropriative valorization processes of capitalism—the “valorizing information,” to use the term that Romano Alquatti presciently used to describe workers’ contributions at Olivetti in the 1960’s, that is today everywhere extracted.<sup>4</sup> It also suggests that despite the invisibility of an increasing proportion of machine operation in ultra-fast, ultra-small computation, in the internet of things and in what crypto-currency programmers are calling “the internet of value,” the screen/image retains key functions and is, in fact a necessary moment in the valorization process of capitalist computing. The analysis of the screen/image that at once serves as interface and engenders the production of both data and meta-data raises the question of what it might mean to seize the means of production, particularly when many if not most readers (here just like most readers and non-readers everywhere) are experiencing a crisis of control not just over the management of the (built) environment, the workplace and its infrastructure, but over their attention, interiority, self-image, imagination, social practices, relationships, and time. The survival of all of these forms of precarity, remunerated or not, is at once bound up with the seeming impenetrability of informatics and algorithmic governance while having become means of production for capital. As I hope will be apparent, the struggle over the means of production, includes the domain of socio-cultural analysis and conceptualization, as well as of culture and interiority, in addition to the more familiar notions of fixed capital. Such analysis provides a necessary, even if by no means sufficient, component of struggle.

## The Programmable Image, or, From M to M’

In a forthcoming essay entitled “The Programmable Image of Capital: M-I-C-I’-M’ and the World Computer,” I argue that in order to correct the multiple misunderstandings in various “post-Marxist” analyses of capital that assume that value has become “immeasurable,” it is necessary to bring the labor theory of value up to date.<sup>5</sup> In “The Programmable Image” I extend my earlier hypothesis of the attention theory of value in *The Cinematic Mode of Production* (in which “labor” was understood as a subset of the emergent yet more capacious category of “attention” and, conversely, attention reduces to what used to be called labor at the sub-light speeds of non-screen-mediated production), and rewrite the general formula for capital, M-C-M’ (where M is money, C is the commodity, and M’ is a greater quantity of money realized in the sale of the commodity C), as M-I-C-I’-M’.

In this new equation, we replace commodity C with I-C-I’, where I is image, C is Code and I’ is a modified image). Where paradigmatically, labor had once been sedimented in the commodity-object, I had argued in *The Cinematic Mode of Production* that attention was sedimented in the image, and furthermore that commodities and images converged as image-commodity.<sup>6</sup> In the cases of both labor and attention, sensuous activity produced surplus value for capital through dissymmetrical exchange. With the wage, as Marx clearly showed, workers put more value into the creation of commodities than they receive in their wages, with spectatorship, spectators do more to valorize and legitimate images, media platforms and the *status quo* than they receive in pleasure or social currency. In bringing the industrial revolution to the eye, the cinema opened up the mediational spaces of what would become known in autonomist Marxism as the social factory—albeit in a manner that was more or less incognizant to the technical and indeed techno-logical aspects of this very mediation. In my most recent work I have endeavored to show that forms of attention result in the modification of code on the pathway to monetization. This

relationship between image and code, I argue, is the paradigmatic form of leveraged mediation in the distributed production and consumption of post-Fordist capital. Value extraction, instead of taking place only during wage labor as it was purported to do under industrial capital, can take place anywhere in a network in which oscillations between image and code occur. The embodied entity, formally known as the “laborer” or the “human” is still the source of all value for capitalism, but has, to use a cutting term from Sean Cubitt, been structurally reduced to a “biochip” in an increasingly ubiquitous computational armature.<sup>7</sup> The absorption of value is thus no longer paradigmatically organized around a factory worker producing an object for a wage. In our era there has been an exponential intensification of the number, form, and distribution of sites of production as well as in the metrics of evaluation and remuneration. As “Bifo” aka Franco Berardi puts it, production and valorization have become, “cellularized.”<sup>8</sup>

While it is patently true that hundreds of millions of people still work in much the same way as in the industrial age (on assembly lines, in factories, for subsistence wages, without safety nets), it is also true that any and nearly all commodities (the iPhone, say) today rely on the integration of various moments of valorization: commodities are no longer paradigmatically objects with singular points of sale, but rather arrays of images (imaginaries) tethered to computable information and anchored to a distributed material system with multiple points of interface. The iPhone is a particularly good example, because even as the A-side of its screen is immersed in networks and clouds, the B-side depends on a network of labor practices that are effectively forms of enslavement.<sup>9</sup> Therefore, when considering informatic production in the world of the programmable image, think not just of Disney’s organization of the imagination through franchises and product lines of *Frozen*, but also of the share pricing of Apple and Google with its tendrils in rare-earth mines, factory servitude, national and geo-politics and a rentier model of the general intellect. Thus we can see that early capital’s generalized quantification and therefore digitization that renders nearly all human practices computable in industrialization but also, and emphatically, through colonialism, is the pre-history of the current moment. Like the ledgers of slave ships, the East India Company, and monopoly cartels, the metrics of dataveillance are precisely the metrics of valuation. They measure the very metabolism of a society organized by screens in a way that suggests that computational capital is also computational colonialism. These screens interface the dynamic data-visualizations of computational capital and convert the general population into content providers. They are also worksites—points where attention is required to valorize capital through the production of new information.

There is more to this formula and its functionality in the post-Fordist milieu defined by computational capital, but I do not want to repeat all of the main points of the M-I-C-I’-M’ essay in which I try to formally demonstrate the viability of this formula. I’ll just add here that fractal celebrity on social media (such as Instagram and Facebook), and the currencies of “likes” and the like, are one of the salient features of the ways in which we (as individuals, dividuals, cellularized intensities, whatever) are enjoined to wager in the programmable image to get ahead in the thoroughly financialized market of daily life that has become inseparable from sociality itself. We are programmed by images and we program with images, all the while generating data, that is, modifying code. Significantly different (but less so than one might think) from the plantation, this sense-/attention-/cognitive-/neural-/location-mediated modification of code is the paradigmatic mechanism of value extraction today; it is the unhappy evolution of labor and the new expansive and all encompassing form of work in what Pasquinelli calls “the society of metadata.”<sup>10</sup> As with the regime of labor and cinematic attention, there are some pleasures involved both in the process and as the result, but their distribution is

profoundly unequal. The more than two billion dispossessed within this planet are both the condition and result of this regime. The Instagram porn-star in Moscow or LA and the Syrian refugee struggling for survival are each overdetermined if not almost fully absorbed in the ambient semiosis that is part of the precarity of informatic financialization, but the benefits of this (partial) self empowerment via a struggle with info-servitude and computer mediated abstraction accrue unequally along the lines of a hierarchy of historically negotiated codes and codifications—including race, gender, nation, class, citizenship, etc.— that are among the vectors of what is increasingly algorithmic governance.

Here I will be committed to interrogating some of the new pathways from M-M', that is, the movements in an expression that Marx saw as capital's "concise style" in which money becomes more money. However, I will partly undertake this investigation into the production of interest by providing negative examples: I will focus on certain elaborations and ramifications of the relationship between image and code as a space of politicization and anti-capitalist praxis, rather than as a practice of capitalist valorization. Not in all cases considered here, but in many, the practice of resistance, refusal, *détournement*, or re-programming reveals the dominant while generating critique, counter-culture, and counter-history.

We have seen from recent history that among the myriad intervening subroutines in the movement from money to more money in capital, that is from M-M', is the financial derivative. The derivative, part of the contemporary era characterized by "financialization," is, as the late Randy Martin tells us, an economic formation that, by the general account, broke the economy in 2008, wantonly making "something out of nothing," and allowing "a greedy few [to take] advantage while regulators looked the other way."<sup>11</sup> Martin observed the following:

While derivative principles have been applied in economic settings for thousands of years, albeit without the materiality or impact they presently exercise, their logic has a presence in many fields. Despite entering august dictionary listings and public discourse only in the past decade, derivatives actually have a long history and complex genealogy that incorporates meanings from law, medicine, geology, engineering, chemistry, music, calculus and grammar. In all these senses, derivatives are a transmission of some value from a source to something else, an attribute of that original expression that can be combined with like characteristics, a variable factor that can move in harmony or dissonance with others.<sup>12</sup>

The derivative emerges in modern finance as a risk management tool. For example, if a US based business enters into a contract to make a purchase six months from now for one million Euros, it can also purchase an option, that is, a contract, to buy Euros at a set price (say one million Euros at \$1.10 per Euro) to hedge against the risk of a large price fluctuation that could make Euros more expensive. Such a contract offsets risk. In fact, it represents a stochastic relation to the market, a weighted bet on one set of results within a statistical range of outcomes. Thus it requires—and in fact is—a reading of market forces, including the psychology of all players, it is, in short a wager on the movement of the totality of the market regarding how market movements may affect the pricing of a particular commodity.

Understanding the instrumentality of this hedge or derivative as an endeavor to guarantee a return on investment allows us to see that advertising can be viewed as another instrument of risk management, one whose various forms, have, like those of the financial sector grown into an "industry." The comparative of these two entities is mutually

revealing. Like the financial industry, the advertising industry makes the case to investors for its own legitimacy and productive potential.<sup>13</sup> It formalizes “social cooperation” and endeavors to leverage it for the benefit of its investors. Here however, the wager on market forces directly depends upon a formalized (and increasingly algorithmic) organization of the psyche and/or semiotics via the programmable image. Just as the various derivatives from commodity circulation open up spaces of transactions within a transaction (transactions which themselves can be bundled and sold), we can demonstrate that this logic of the derivative—itsself a calculus of multiple transactions that reduces a process to a price (per eyeball, yes, but increasingly which eyeball?)—pertains specifically to image-function. These new “industries” have long troubled a Marxism that in large part was capable of only a rudimentary, quasi-Newtonian conception of the commodity-form and thus of productive labor—a form that, as I tried to indicate in “The Programmable Image,” was itself a derivative though not fully understood as such. However, as early as 1977, in his famous “Blindspot” essay, Dallas Smythe recognized the productive role of audiences in the valorization of commodity pricing, and in making a case for the concept of “the audience commodity” by arguing that audiences do the work of learning to consume, introduced a networked model of valorization that factored in the productive value of tapping psychology, perception, desire, imagination, and the like—the very stuff of what I endeavored to describe as the basis of the attention theory of value through an expansion of Marx’s notion of sensuous labor.<sup>14</sup> The effort was to conceptualize what was transacted (and indeed produced) in the network. It was a theorization of the evolving logistics of the market—always already a network, even if not conceptualized as such. The comparison of these two “industries” reveals that risk management techniques account for the vagaries of subjective actors and inter-subjective social dynamics by creating a spread. They are price indexes of volatility, calculi of capture networked via screens.

## The Photograph as Image and Code

As already indicated, the technical and computational elaboration of the networked screen/image as a means of production and value extraction is, from a technical point of view, the paradigmatic adventure of post-Fordist capitalism, the cutting edge of computational capital. Social media sights, with their constant circulation of images and the metrics they develop to evaluate such circulation, are part of the command-control operations that organize social production and reproduction—sociality—more generally. But rather than reviewing the productive dimensions of visuality here (the labor of looking, the attention theory of value, neuropower), that increasingly can be understood to traverse sensuality, speculation, and social praxis, let’s consider a particularly critical and brilliant approach to image production, indeed, one could say *image-production*: that of Ariella Azoulay. Though not focused on digitality, in books such as *The Civil Contract of Photography* and *Civil Imagination: A Political Ontology of Photography*, Azoulay undertakes a radical reconceptualization of photography and its various programs. A consideration of her revision of the significance of photography, will, in the context of a discussion of what I think of as the worksite of the image, serve to illustrate some of the productive stakes, implicit in photography’s multiple derivatives. Azoulay’s reconceptualization of the ontology of photography, disrupts received notions regarding the contract of photography and reveals that reigning conceptions of the photograph (its authenticity/truth, the sovereignty of the photographer, the abiding distinction between “art” photography and “political” photography) secure social relations by normalizing certain forms of agency and excluding other forms in ways that renders society predictable. The extant conventions of and around photography, are correlated with regimes of citizenship, state power, and importantly, forms of exclusion, as if the

institutionalization of photography (its commonsensical understandings) were itself a mode of risk management working in the service of the *status quo* of state power.<sup>15</sup>

Rather than indicating a violence *inherent in* the received form of the photographic apparatus as I myself felt compelled to do in a too brief study of photography as a racial formation,<sup>16</sup> Azoulay reframes the ontology of the photographic medium as “the *political* ontology of photography.” In contradistinction to theorists such as André Bazin or Roland Barthes, who understood photography first and foremost as a branch of chemistry, she understands photography as fundamentally a social relation—one in which there are many stakeholders. Whether one is in front of the lens, is behind the lens, is before the image, is a purveyor of the image, has access to the image, is denied access, is represented, is unrepresented, has moved into the space where the image was made, or has been forced out, etc., one may be a stakeholder in the meaning and usage of an image. This notion of the photograph as distributed social relation is quite different from Barthes’ notion that the distinctive feature of the photograph, its “essence,” is a relation to the Real—its “that has been-ness.” But as even Barthes intuited, albeit by means of a naturalistic ontology positing chemistry at the origins of the photograph, the received notions that organize the practice of photography and its allied perceptions (visible in what Barthes called “the *studium*”), are hedges against the risk that photography itself represents. The precarity of the photographic rules of perception were also obvious to Barthes. As is well known, the semiotician writing under the staggering weight of the loss of his mother while considering a photograph of her, made his apologia in *Camera Lucida* for the limitations imposed by semiotics itself: for Barthes the photograph contained within itself the possibility for the violation and indeed the explosion of extant semiotic codes, opening out through the chemical fixity of a “that has been” to what he glimpsed as the “madness” of the Real.<sup>17</sup>

Azoulay too understands that received interpretive codes and the institutions that maintain them organize photography in a way that produces and reproduces the status quo. By dilating the event of photography well beyond the presence or absence of the snapshot, and introducing what she calls “the civil contract of photography,” Azoulay, in an admittedly utopian (but nonetheless political) vein, is able to posit a “citizenry of photography” whose inclusivity of those who may have a stake in the image surpasses not only the received notions of what photography is but also the inclusivity of the contemporary nation state—as the nation state imposes a distinction between citizen and non-citizen while adjudicating over them both.<sup>18</sup> The photograph would open to a discursive space in which anyone might respond. Drawing upon photographs of Palestine and of Palestinians—both taken and not taken, visible and invisible—as her archive, she gives amplitude and voice to the many perspectives and consequences of the various photographic events and events of photography embroiled in the fraught history of Palestine, Israel, and indeed of the modern world, in a way that allows the entrance of Palestinian perspectives, histories, and claims into an archive that might otherwise exclude them and in practice does exclude them. And it needs to be said that she makes this case in a national and often international context that systematically excludes Palestinian claims on life and uses this exclusion as a justification of further violence.

Importantly for Azoulay, who has been both curator and critic, Palestine has become not simply an open-air prison as is widely recognized, but an “open studio” for the purveyance of images of “regime-made disaster.” Azoulay’s embedding of the photographic event in social relations profoundly affects the kinds of statements that can be made about photography and begins to reveal not just the complicity but indeed the support that conventional notions of photography lend to apartheid regimes. Her work endeavors to

open the archive to political claims to representation, history, and justice in order to create broad-based anti-colonial solidarity in response to instances of violence pushed to the margins, remaindered, or invisibilized by photographic conventions, while also holding out, in this case to Israeli citizens, what she calls the possibility of “the right not to be a perpetrator.”<sup>19</sup> This latter is something nearly impossible for Israeli citizens to exercise currently. In short, in her work, images along with the praxes and discourses they engender, become the worksites of culture and struggle, rather than things necessarily and in many ways unconsciously consumed in accord with conventions and habits complicit with state violence. However, her displacement of these conventions (conventions which by virtue of their entrenchment have naturalized around photography both a set of practices and a metaphysics), illustrates how productive their normative functions are both to state power and racial formations.

In dilating the photographic event and opening it to many (Palestinian, anti-colonial, anti-fascist) stakeholders beyond the photographer, the museum, the newspaper, and those represented in the image, Azoulay reveals the political ontology of photography and grasps that ontological condition as a distributed social relation. In changing the types of statements one can make about the photograph, that is, in altering the discursive field around photography away from what is, for the enfranchised, a comfortingly un/de-contextualized context of a photograph, and away again from sovereignty of a photographer’s intent or artistry, or a procustean distinction between politics and art, we could see Azoulay as providing a kind of counter-praxis to Paolo Virno’s virtuosity, slated, here, around photography, that ordinarily, in conforming to statist interpretation and usage of a photograph would also conform to the exigencies of capitalized state power and of capital, along with their productive pre-scripting of discourse.<sup>20</sup> Thus, Azoulay’s renegotiation of the ontology of photography is a strategy of semio-war; her disruption of the very notion of photography disrupts its scripts: the ways in which we participate in its practices and institutions, as well as its programs. It is therefore a retaking of cognitive-linguistic capacities that ordinarily are organized by the photographic programs that are part and parcel of the oppressive racial capitalist state.

To launch her reconceptualization of the embedded and distributed character of a photograph, whose meaning is “never-ending,” Azoulay insists upon a shift from the paradigm of art (with its canons, geniuses, and exemplary images and its isolation from the “*too* political”) to the paradigm of visual culture. We confront the fact that the vast institutionalization of photographic practices, from gallery curation, aesthetic evaluation, and captioning, to ideas about the role of photographer, critic, viewer, and the metaphysics of the image, etc., not only bear the signature of a statist imaginary, but reinforce state-power, its models of agency, civility, adjudication, jurisdiction, and epistemology, along with its presumed right to violence, the encampment of populations, militarization, incarceration, apartheid, and the rest of the necropolitical imaginary. In deterritorializing the paradigm of art and its cultic models of authority with that of visual culture and its sense of distributed participation, we may observe here that with the displacement of the hegemony of the single image or unitary voice by the churn of a distributed media ecology, it would not be wrong to glean also that the practices of social media are implicit in Azoulay’s reconceptualization of photography.<sup>21</sup> It is therefore important here to recognize that the dilation of the photographic event as image in mediological process has a dialectical relation to code—not now simply as “natural language” or “semiotic convention” but as “computational language.” The recoding of the image, the effort to restructure its processing in ways that do not conform to those organized by the hegemony of the state, of capital, of advertising, can be seen as providing the means to intervene not only in state power, but in semiotic and thus also

computational and financial codification: Code. Before platform fetishists object, I hasten to remind readers that precisely these negotiations of image and word feed all types of computation: from word processors, booksales, Twitter feeds, tech-startups, and platform innovation, to military simulations, the arms industry, stock markets, banks, and states. Semio-capitalism places the generation of meaning and financialization in the same domain. Indeed, as I want to suggest, Azoulay's view of the photographic event as "never ending" draws paradigmatically upon the distributed exchanges that take place in social media: she offers a theory that presupposes the complex relation between image, sign, and number, one that might help us to recognize that the anatomy of social media is indeed the key to the anatomy of photography. As we saw previously with the commodified object, few of its derivative functions were accessible or actionable in the earlier form, but they were latent or immanent as philosophers might say. The photograph (taken or not) was always-already a node in a network of indeterminate specifications. With the photograph then, an intervention in the vectorized movement of I-C-I' that would preclude the production of an I' within a certain range of statistically predictable parameters held in place by Zionism, settler colonialism, military industrial power, vertical financial integration and the art world, is also an interruption of the circuit M-M'. It is a break in the program of capital, a disruption of data-flow, a crisis of valorization, a hack.

## Worksites of the Digital-Visual

In the latest instance of financialization, life (whatever that is) wriggles under an emergently totalizing field of informatics—all communication, all knowing, becomes inseparable from image and code. The expanded field of operations under the domain of the logistics of the screen/image, which places perception and discourse in a feedback loop with capitalized machinery and makes these subject to algorithmic governance clearly extends to the cinema—indeed cinema was a kind of first instance where the dynamics of what was to come became discernible. I would agree with Patricia Pisters, who notes the omnipresence and variety of screens:

In spite of all the capturing forces that operate on our multiple screens, it is possible to see the media as a gigantic network of baroque perspectives where particular points of view and the psychological effects they entail become affectively entangled. We can say that in the new logistics we are not [(only)] passive spectators captured by institutional or ideological power even though these are still powers that need to be taken into account.<sup>22</sup>

Pisters calls for an active, agential relation to the multiplicity of images traversing the socius. In the media-environment, "Our real and virtual bodies are involved in complex ways that cannot be translated into simple ethical rules; we need instead an affective openness to be brought to the idea of cinema and (into) the world itself. By creating images, or simply by being affected by these images, we can participate in bringing reality and feeling back to the vortex of our multiple screens."<sup>23</sup> Emphasizing these fault-lines at the interface just a bit, we might observe that in the context of Berardi's "semio-capitalism," we are, in the extended field of the image, engaged in Pasquinelli's "immaterial civil war."<sup>24</sup> In the struggle over meaning and codification, day-to-day living becomes a kind of full-body, low-intensity semio-war—low-intensity, that is, for the privileged/lucky. But whether the struggle is for a few more likes on an Instagram account, dodging a drone strike, or avoiding the fallout of a sovereign debt crisis, an ethnic cleansing, or a genocide, somewhere, the stakes are life itself.

Rather than dealing here with the more familiar, yet suddenly far more interesting and relevant question of cinema (as program, what I call the cinematic program) and the

aesthetic (as interface), or the equally interesting question of what Hito Steyerl calls “the poor image,” I would like to focus on less familiar worksites of the digital-visual.<sup>25</sup> Before turning to these new frontiers, we note in passing that the narratological, psycho-sexual, spatial, racial, ideological, visceral, and affective are now all also and, within this matrix, always, vectors of attentional production and digitization. Additionally, the new modes of negotiating screen/image-space, discussed below, via the reorganization of attentional, sensory, and neuronal practices coupled directly to computer programming have given rise to new forms of life.<sup>26</sup>

One example from the more sinister and austere side of navigating the logistics of visualization is CV Dazzle (<http://cvdazzle.com>) or Computer Vision Dazzle Camouflage. Designer Adam Harvey explains:

It is a form of expressive interference that combines makeup and hair styling (or other modifications) with face-detection thwarting designs. The name is derived from a type of camouflage used during WWI, called [Dazzle](#), which was used to break apart the gestalt-image of warships, making it hard to discern their directionality, size, and orientation. Likewise, the goal of CV Dazzle is to break apart the gestalt of a face, or object, and make it undetectable to computer vision algorithms, in particular face detection.<sup>27</sup>

Harvey has also developed an anti-drone wear line.

What is noteworthy is that the negotiation of visual appearance is organized by the endeavor to elude the algorithmic detection mechanisms of code. While the “look” generated by these forms of life is visible and affecting in the social domain, the operative frame of reference is the computational algorithm and its apophenic discernment. Thus the reference domain of the machine-mediated computational process—its ability to discern patterns—is the practical target of these wearable interventions in the becoming normal of always everywhere ambient computation. Here too, as with the example of Azoulay, the resistance practice also illuminates the dynamics of normative functioning of a ubiquitous computational surveillance or omniveillance, that, as Edward Snowden and Laura Poitras irrefutably revealed tends toward anyone-anytime-anywhere geo-location and identification. The Hollerith punch card, used in the early national censuses and the Nazi holocaust, has come a long way indeed. Today, cell phones have already rendered many of our movements fully computable, potentially providing not just details of where you are when, but of income, residence, citizenship, spending habits, sexual preference, criminal record, etc. Soon, with the rapid acceleration of machine learning and neural networks, just your face will do all that and more. As the work of managing your face (location, expression, composure, affect) increasingly pushes networked discrete state machines (now to be thought of as The World Computer) into new states, the two meanings of “profile” will converge, pushing the interface back into your face. From a surveillance standpoint, your face will be the interface. Or rather, it will be *an* interface, since ambient, ubiquitous computing and the internet of things will provide multiple overlays for all varieties of targeting.<sup>28</sup>

The reparsing of the informatics of images (of viewing the image as fundamentally composed of information) is also bringing about a reconceptualization and reprogramming of photographic image-capture at the computational level. As it turns out, a tremendous amount of information is lost in the classical projection of images by conventional optics. Rather than creating a limited projection with a single focal plane, as with the classical optical camera projecting light onto an emulsion plate, light field cameras (such as Lytro), use digital sensors “to capture all the light” (all rays of light

traveling in space at every point) and thus to capture its directional information. This apparatus moves image capture into the explicitly computational domain. Images can be refocused after the fact in a kind of reverse rendering such that any given image can be refocused at any plane in the field merely by indicating a focal point on that plane with a finger or a mouse and recalibrating the depth of field.<sup>29</sup>

The realization that there is a tremendous amount of information in the light field and that much of it is lost was also the theme of a paper presented by Andreas Velten at a symposium called, in homage to Vilém Flusser, “The Photographic Universe” held in 2013 at The New School in New York City. Velten demonstrated a superfast camera that could slice light input up into nano-second frames such that one could actually image a light pulse traversing the surface of a tomato. These images, sequenced as a video composed of nano-second time slices showed that the tomato itself became a light source through quantum absorption; it absorbed part of the light pulse and then emitted light after the initial pulse had passed and faded back into darkness. Light emission can be treated not just as visible light, but as computable information. Such computability is precisely the treatment of light in another project also being developed by Velten and colleagues to build a camera that can see around corners. By doing the math, it is possible to track scattered light in order to resolve an occluded object, a man for example, out of the line of sight around the corner of a building and therefore invisible to the eye or ordinary image-rendering technologies. By effectively treating all surfaces as variants of mirrors, and processing the scattered light vectors and focusing them back into the occluded space one resolves an image of the man around the corner. Computational reconstruction of light scatter allows for a data visualization that creates an image of a figure ordinarily occluded by the function of conventional optics. Velten’s admission that this project is funded by the section of the Pentagon known as DARPA (Defense Advanced Research Projects Agency) clearly indicates the instrumentality here. Although the presenter took the position that computational photography was all about the science, it is noteworthy that of all possible funders, it seems that the US military is most willing to invest big money in the opportunity to see around corners. Indeed, as with our reading of Azoulay’s work, computational photography makes it clear to us that images “themselves” are all about *modes* of data-visualization, and that furthermore, data visualization is always instrumental—even if, as an archive, data, and the images it generates, may be open to multiple interpretations. These technologies expand both the archive of the visual and the number of semio-technical worksites—introducing new functions and interfaces with the domain of conventional operations. They become instruments of production and political programs. The effort to program and reprogram these worksights are also efforts to organize the production and reproduction of social life. So, emphatically now: A political ontology not just of photography but of images, semiotics, and code.

Two examples show the further ramification of the life-world by computerized vision along the pathways of valorization prescribed by capitalist hegemony. The first is two DARPA programs which effectively turn biotic components (aspects of the human sensorium) into the prosthetic extension of algorithmic processes. These algorithmic processes are of course developed for and by the securocratic state. Such ramifications represent the new technics of internal colonization in that they fragment and operationalize aspects of the sensorium. Human eyes and neuronal pathways become sensors for computational functions that can parse the inputs to recognize an “enemy” before a soldier consciously perceives one, or analyze at the speed of light the psychic response of a suspect under interrogation. Here the priority of image and user is fully reversed as the human sensorium becomes an input device for the command-control function of computation while the human body becomes an algorithm’s avatar. This marks an advance of sorts over Norbert Wiener’s observation that with cybernetics “low level

discrimination” will be left to a machine, since here it is the humans that provide the low-level discrimination, while the machine makes the higher level synthesis and presumably is the one that issues the instruction to fire an attack.

The second example is a *New York Times* photograph from a story <sup>30</sup> describing a collaboration between German car manufacturer Audi and an Israeli tech start up, which provides evidence for the kinds of gains possible for corporations and states when computerized vision takes over steering (the original meaning of *kubernētis*, “the art of steering,” and the Greek root of cybernetics). Not only is automobile transportation taken over by the computer automated control of vision, but it seems that the critical function of vision is as well, since here at least, in the *New York Times* coverage of the driverless car, the vehicle is shown next to an apartheid border fence without comment. A better headline for the story might be “Israel Automates its Vision and Drives using German Technologies,” though no doubt the gallows humor would be lost on many readers, who unbeknownst to them, perhaps, have already had much of their own vision and drive outsourced to automation. The technics of computational colonialism organize both territory and spectator with their steering and drive.<sup>31</sup>

If what Flusser calls “the universe of technical images”—in which cameras organize the world for their own advancement—results in what Wendy Chun deftly names “programmed visions” we begin to get a sense of the fundamental organizing system of computational capital.<sup>32</sup> Chun’s phrase and her ground-breaking book of the same name complicate the seemingly clear distinction between image and code. Similar to Chun’s argument about software, which is, in brief, that it is ultimately inseparable from the media-environment in which it functions and therefore has no rigid border or discrete being (software is not just a metaphor, but a metaphor of a metaphor as she says—and machines “leak”), we must proceed with the working hypothesis that there is no longer any tenable strict distinction (non-dialectical, essential, or ontological) between image and code.<sup>33</sup> “Image” and “code” designate moments in a process, just as “money” designates a user-interface for the value form. Thus I-C-I’ in the formula M-I-C-I’-M’, like the commodity “C” before it in M-C-M’, is also a hypostatization—a moment in flux. I-C-I’ is really I-C-C’-I’: The definitive formula for the circuit from M to M’ is M-I-C-C’-I’-M’, where it is understood that the instances marked by the variables are themselves moments in a flux—technically mediated forms of hypostasis.

Just as Flusser’s example of a shoe as being an expression of information only became understandable as information, that is, only *became* “information” after the rise of informatics, the image—and by this we mean any image: a Renaissance painting, a printed page, a retinal scan—is now understandable in terms of codes because it is grasped through the matrix of code. This is a practical as well as conceptual matter. The screen/image is not finally separable from the code that renders it, nor, ultimately is the current organization of visuality. The *Mona Lisa*, either in the Louvre or on your screen, is no longer just a painting, it is a node in a vast informatic network—as are “you.”

The proliferation of computerized vision machines tends to function by automating vision in ways that confirm Flusser’s early insights that humans had become functionaries of the camera. As functionaries of the photographic apparatus, humans for Flusser became subject to constant feedback through the multiple feedback loops between social practices of all sorts and technical images—the significant surfaces resultant from the program of the camera.<sup>34</sup> Given the dominance of images in all social endeavors, the full digitization of images—their subsumption under the regimen of capitalist informatics—indicates that computational production on the digital treadmill becomes the general form of productive activity in the interval between M-M’. Through our negotiation of

images (attentive, distracted, psycho/neurological, semiotic, metabolic, unconscious, etc.), we tend the code, which is to say, that in an ironic return to Chun's analysis of early computing at ENIAC where women were the first computers, we too are the computers—the feminized supplement.<sup>35</sup> Put another way, they are also “us.” Indeed Flusser's astonishing work on photography was only possible because he was among the first to see clearly that an emergent computational logic was already at work in the photographic apparatus, as if, in an extension of Marx's fragment on machines, cameras converted persons to conscious organs in the vast automaton of photography. As “functionaries” of the photographic apparatus, we have already been processed by its computational logic, which is to say, our words and our time have been cut up, we have internalized its codes, our relation to reality has become magical, and what we are is part of its expression. As “functionaries” in “the universe of technical images,” we compose ourselves in a *mise-en-scène* of computation-production in order to engage in computation-production. To quell (or exacerbate) any lingering doubts regarding this claim, simply open your Facebook or Instagram. Or look around. Most of what we see, what we process, what we do now is informatic labor for computational capital in the computational mode of production. This real abstraction from the life-world is precisely the metabolic processes of the social undergoing monetization in a dissymmetrical relation to capital accumulation. Among the results is Stiegler's proletarianization of the senses.<sup>36</sup>

It is an awareness of such macro-political-economic meta-programs that allows us to raise the most serious questions about the function of automating machine vision and data visualization. This process goes deep. It involves not only the automation of sovereignty by machine protocols, but the sedimentation of historically-produced social difference in machine architectures. Programs are not only networked to one another but nested within one another. Here, as Tara McPherson has lucidly pointed out, actually existing computation cannot be thought separately from contemporary racialization.<sup>37</sup> In a discussion of UNIX, the ground-breaking operating system developed by Ken Thompson at Bell Labs, McPherson shows that the history of UNIX reveals that the push for increased modularity, which involved the compartmentalization of tasks, the connectivity of these various modules through “pipes”, and the creation of higher levels of programming that can nest these modules in blocks (such that today an imovie user needs to know nothing about binary code) overlapped first with the racial logic of segregation, and then with that of neo-liberalism, which “hides its racial ‘kernel,’ burying” modular separation “below a shell of neoliberal pluralism.”<sup>38</sup> McPherson argues that “across several registers, the emerging neo-liberal state begins to adopt “the rule of modularity,” in order to separate and contain allied antagonists.<sup>39</sup>

Regarding compartmentalization of computational tasks alongside segregation, and then the burying of these forms of separation under user-friendly formats dependent upon the rule of modularity, McPherson writes, “the emergence of covert racism and its rhetoric of colorblindness are not so much intentional as systemic. Computation is the primary delivery method of these new systems, and it seems at best naïve to imagine that cultural and computational operating systems don't mutually infect one another.”<sup>40</sup> With respect to the visual turn, she argues

I would argue that to study image, narrative and visuality will never be enough if we do not engage as well the non-visual dimensions of code and their organization of the world. And yet, to trouble my own polemic, we might also understand the workings of code to have already internalized the visual to the extent that, in the heart of the labs from which UNIX emerged, the cultural processing of the visual via the register of race was already at work in the

This admirable bit of dialectics accords with my own view that modern media platforms are themselves racial formations. The recursivity of sociality, visuality, and codification means that logics of racialization and gender formation are sedimented and functionalized in machines. The denial of this thesis through the assertion of technical emergence as a product of a/non-political (objective) science ontologically grounded in the sublime neutrality of mathematics—a position either assumed or asserted outright by so many tech boosters—would perform a kind of platform fetishism. Platform fetishism, not only reifies a formation by imposing ideological boundaries, it occludes the history of platform emergence by affirming a maternal bond with presumably racially unmarked technologies and unproblematically transcendental modes of knowing—all the while disavowing the historical embeddedness of technical form: the dialectic between technical form and social becoming, the *historicity* of form. That the free-flowing sovereignty of neo-liberal subjects of capital is founded upon modularity, containerization, sequestration—walls of all kinds—is undeniably consistent with the practices of slavery and coloniality. It demands further thought. For as is again and again demonstrated, the racism of neo-liberalism is but one small step away from the full blown fascism of Trump—and we should take careful note that for its most aggrieved victims, the difference is non-existent.

Productive life activity today passes through the constant transformation of code and its platforms (a distinction that while still useful is, as noted, difficult to maintain) in the ordination of value. Indeed a Facebook “like”—an Orwellian reduction of Old Speak vocabulary if there ever was one—was recently given a dollar value: \$174.17.<sup>42</sup> That was in 2014. Facebook recently introduced a few more options to make user’s desires more visible to advertisers. The mere touch of a pad/screen introduces a change in functionality that engenders new access, connections, and information...for corporations above all. New metrics of “value capture” are everywhere.<sup>43</sup> Xbox One Kinect’s sensor can now determine whether you and other users watch the commercials displayed; reward systems are being devised by Microsoft to pay users for their interactivity. Samsung was working on a phone that stops video display until users are looking at the screen, making it impossible to turn away during commercials and still get to your content.<sup>44</sup>

But in the dynamic coordination of centripetal and centrifugal forces from M-M’ there is plenty of dissent, alternative wagers within the technical image. Laurel Ptak’s Wages for Facebook project embraces what we have now known for sometime: that we are the producers of internet platforms—and that as private entities these platforms represent massive expropriations.<sup>45</sup>

Andrew Norman Wilson, formerly at Google and fired for making videos of declassified workers leaving the Googleplex in Mountain View California poses another challenge to the apparently seamless, because invisible, absorption of labor by screens/images. It appears that the very fact that he tried to develop another kind of visual relation to workers whose population was composed primarily of poor minorities, who were denied access to Google’s cafes and other perks reserved for white-collar employees, and who received different work schedule than these “regular” Google employees to prevent interaction at closing, was enough to get him fired. These were the book scanners. Ironic that he got fired from Google for producing too much information. Wilson also retrieved rejected images of scanned books, errata that bear the traces of the condom clad fingers of workers, as a new kind of documentary evidence of the presence of people amidst the data—people who are ordinarily disappeared within it.



Scanned book image rejected by Google. (Photo: Andrew Norman Wilson (2012) "The Inland Printer - 164" Inkjet print on rag paper, painted frame, aluminum composite material)

But while I fully embrace and desire to extend the revolutionary and insurrectionary energies percolating through the code, I do not want to end on a note of false hope. The technology underpinning today's very anti-social social-media, has also given rise to media that operate covertly and do not lend themselves to visualizations that can be easily addressed.<sup>46</sup> If computers have led to social-media and financialization, then financialization has also led to anti-social media and computation. Here we are talking about plutocratic corporations working with states, but also interstate virtuosic coordination as revealed by Wikileaks and large scale, privacy-scraping data-harvesting not only by the various Googles, but by security states and their NSAs—which directly or indirectly posit the socio-semiotic metabolism itself as expropriable labor by assigning it a price paid by indebted or otherwise bonded taxpayers and the surveilled. Google's conflict with the NSA over "our" privacy is a proprietary war between giants over who would own our subjectivity, our neuronal function—our capacity to produce "valorizing information."

In revealing the intensifying media-technics from M-M', an image like the following made by Erik Hunsader is particularly instructive:



“10 milliseconds of trading in Merk” is a 6’ and 54” video that shows the dynamism of algorithmic stock trading during 1/100<sup>th</sup> of a second, an amount of time, which, by the way, is not adequate time for the first Merk quote shown in the video to travel at the speed of light from a New York exchange to a London exchange before the video ends.<sup>47</sup> Even though time is slowed by a factor of 40,000 here, the transactions are difficult for the eye to track, let alone account for. And this is traffic in just one stock. The number of transactions taking place at speeds that are effectively that of light illustrates that computation, communication, and financial speculation have become one and the same movement. These integrated functions operate algorithmically and do not lend themselves to real-time actionable images; thus they effectively short-circuit the visual interface. Never mind that the image, as Barthes and many others recognized in one way or another, was already a short-circuit with respect to modes of communication based on “natural language.” Here we find machine cognition cutting linguistic and visual cognition out of the circuit entirely for billions of consecutive machine cycles. This is mechanized, or rather computerized “attention,” exactly what Norbert Wiener called “low-level discrimination” but now capable of executing algorithm-based “decisions” at the speed of light. Nonetheless, and though some have been tempted to say that the visual is no longer paramount, these lightning fast computerized trades are imaged in the biological or human-readable time of the balance sheets of traders, who use those results to buy their cars, their art, and whatever other semiotic mirrors they require to make it worth their while to rework the programming and keep up with the Joneses. Though it is becoming difficult to say whether it is the algorithmic trading that is the real content of the trader’s self image, or if it is the trader’s self image that is the real content of the trade, Marshall McLuhan’s notion that the content of a medium is another medium still holds. It is perhaps necessary to mention that human labor or what Neferti Tadiar calls “life-time” is the content of both.<sup>48</sup> As if in affirmation of Virilio’s thesis in *Speed and Politics*, we see that outpacing conventional constraints on space-time is a means to wield power within conventional space-time.<sup>49</sup> Here the lightning fast shuffle of proprietary entitlements (ownership) outflanks the psyche of the market and most of its content providers, capturing value whose predominant scene of production is elsewhere.

## Working for the Blockchain

Obviously the list of new pathways from M-M’ capable of capturing socio-subjective activity might be extended infinitely, but I will not attempt to do so here. In closing it is worth gesturing towards Bitcoin and cryptocurrency as a significant development of the relationship between computation and the socius. Bitcoin is a directly monetizing social

medium. As has been said, it signals the emergence of the internet of money. Arguably, money has always been social media—an encryption of social relations, a platform that sheered off ungainly and difficult-to-abstract stuff like qualities and history in the practice of its own digital rationale, while simultaneously creating its own mechanisms of storage, retrieval, circulation and account.<sup>50</sup> Historically, subjective activity was encrypted in commodities that were themselves encrypted by the value-form—this encryption was in fact the very condition of wage-labor and capital. Money in its various determinations, as store of value, as medium of exchange, and as capital, is currently being abstracted as user interface, platform, and operating system. Cryptocurrencies avail themselves of the fact that money is inexorably a social and a computational relationship, and exploit the possibility of developing a proprietary relation to the encryption process itself. With Bitcoin, this is done by mathematically formalizing every transaction and inscribing it into a permanent distributed public record known as the blockchain. The encryption process is abstracted out from the social and rendered computational. It then sets people to work supporting the machines. Everyone who owns bitcoin is also a shareholder in the bitcoin blockchain, which is to say, the entire Bitcoin system. The encryption process, which requires both subjective and fixed capital investment, includes the instantiation of monetary units as well as organizing their circulation, storage, and sites of exchange. As the six year history of Bitcoin attests, this cryptographic endeavor, which solves the double-spend problem by creating a permanent ledger of each computational instantiation, is also an exploit of the monetary practices and sensibilities of the current conjuncture. First only visionaries, fanatics, libertarians, those who had to send overseas remittances, and citizens of failing states were interested, but now banks and states are also expressing interest—which is to say investing their own capital—in blockchain technology.

Admittedly the absorption of computational capital by a (globally distributed) discrete state machine potentially has increased utility, higher resolution, and greater stability than earlier forms of money. Here the stability and inexorability of distributed machine-mediated computation takes over the function of the state in securing the currency and eliminates the third party guarantor/beneficiary of the bank. But in spite of the real possibility of a Benjaminian work-of-art type of reading (Walter, not Franklin) with regard to the democratizing potentials of the distributed, immutable public ledger that is the non-state-based blockchain, Bitcoin, though anti-state, is not anti-capitalist and can likely be no more democratic than its predecessor monetary systems. This discussion could prove to be a long one, so I will simply state that, much as I would like to be proved wrong here, bitcoin appears to be a new type of anti-social social-media in as much as early adopters speculate on the increasing value ( $M-M'$ ) of a system that converts speculation, human zeal and computational energy (as of 2015 the bitcoin system directly uses more than \$150,000 of energy per day), into a monetary platform in which the monetary units themselves are also shares in the overall value of the platform. This share in the platform, we should note, is also true with other currencies except for the fact that their platforms are capitalist states—national economies and all the opacity, militarism, and anti-democratic centralization that is implied by that term. Bitcoin is anti-state because its value is not “guaranteed” by a government, as in fiat currencies, but by the collective (machine-mediated) perception of and participation in its utility as money. As it is not backed by gold or a state but is rather mathematically secured proprietary access to a publicly encrypted social relation, it suggests an increasing convergence of capitalization and computational sovereignty. The often vague perception of this convergence, in which government by the many (computers) will take over state functions and agency will be enacted from the margins of distributed platform sovereignty, constitutes a large part of the discursive excitement and therefore of the general development surrounding this

technology: as investors and enthusiasts say, buying bitcoin (limited to 23,000,000 coins each divisible into 100,000,000 units) is like getting in on the ground floor of the internet.

At this writing, the most recent notable development in cryptocurrency is Ethereum. Its inventors and adherents stake Ether (its unit of value) as programmable money, different from Bitcoin in that while it is blockchain based, it is fully programmable or “Turing complete.” (See [ethereum.org](http://ethereum.org) for more details.) It claims to offer the possibility of “trust-free contracts” that would “disintermediate” the banks (destroy them) and the creation of autonomous entities that could own themselves: to give a favorite example, a driverless car that services passengers and sees to its own fuel and repairs with the money it makes. More than likely though, rather than one car doing well and purchasing millions of other cars to become king of the road, the result will be that the car will yield “its” profits to its programmers/owners via an organization that is currently being called a DAO (Distributed Autonomous Corporation)—unless, of course, someone figures out how to program the car to return its profits to the *socius*. Here again, we see how even the need to get from point A to point B modifies code and is converted by screen-mediated ubiquitous computation into value-productive activity by spurring programmers and investors to create automatons that will harvest such needs in perpetuity: the very acting on a socially-produced need is slated for capture and monetization. We also see that a technocratic transformation, even one that erodes state power, will by itself be inadequate to political revolution.

Both program and archive, as money, commodity, screen-image, interface, derivative, and data visualization, cryptocurrency is thus far an exploit that churns and swarms in, through, and as our money, our code, our images, our words. In this respect it is paradigmatic—shifting the computational ecology and infiltrating it by introducing new levels of functionality and absorption to the already existing world-historical program of computational capital. As exhibit A of what is being called “the programmable economy,” Bitcoin, and the blockchain technology on which it is built, was perhaps the paradigmatic incarnation of computational capital. Ethereum, which is developing partnerships with Microsoft and numerous banks, as well as spurring a whole new spate of start-ups, today takes computational capital to the next level with “programmable money.” As the cryptocurrency exploits the intimate, we inhabit a media-environment where capital circulation is grasped and abstracted as encryption and data visualization, and can therefore be consciously developed as production via the extraction of informatic labor from historically produced needs. But as it turns out, on a planet that has been completely transformed by computational finance, computational colonialism, and the programmable image, everything else in circulation may have its informatic vectors, its media, its enumeration, including History’s dispossessions, enslavements, genocides, and massive accumulations of violence, violation, and presently innumerable sufferings. Despite the hostile, rampant practices of dismediation, perhaps everything that ever was leaves its informatic trace. Today we must ask: What are the anti-capitalist data-visualizations to which we might affix our energies? What non- and anti-capitalist resources remain ambient?

What new programs might we engender? And how? Down and off-the-grid as we may be, I am not convinced that we can do without some programs. Or without computers—they too are our history, and our history is complex. The answers here are myriad and indeed already in the making. In a Gramscian mode, we might predict that in many useful cases we will link the programmatic with the poetic in wagers of shared sensibility and historical (re-)affiliation ventured against the multiple forms of deferred justice and widespread, ongoing violence.

# Notes

1. Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," in *Illuminations*, trans. Hannah Arendt (New York: Schocken Books, 1969), 241. [↗](#)
2. Sara Ahmed, "Affective Economies," *Social Text* 22, no. 2 (2004): 117-139. [↗](#)
3. See [anarchiveofourown.org](http://anarchiveofourown.org), "a fan-created, fan-run, non-profit, non-commercial archive for transformative fanworks, like fanfiction, fanart, fan videos, and podfic." See also, Allen Feldman, *Archives of the Insensible: Of War, Photopolitics and Dead Memory* (Chicago: University of Chicago Press, 2016). [↗](#)
4. On Romano Alquati, see Matteo Pasquinelli, "Italian Operaismo and the Information Machine," *Theory, Culture & Society*, 32, no. 3 (2015): 49-68. [↗](#)
5. Jonathan Beller, "The Programmable Image of Capital: M-I-C-I'-M' and the World Computer," *Postmodern Culture* (forthcoming Fall 2016). [↗](#)
6. Jonathan Beller, *The Cinematic Mode of Production: Attention Economy and the Society of the Spectacle* (Lebanon, NH: Dartmouth and University Press of New England, 2006). [↗](#)
7. See Sean Cubitt, "Decolonizing Ecomedia," *Cultural Politics* 10, no.3 (2014): 275-286, and "Integral Waste," *Theory, Culture and Society* 32, no. 4 (2014). Cubitt brilliantly argues that "the environment" as an idea is itself the result of the economic "externalities" of the accounting systems of capitalism and colonialism—it is the supposedly extrinsic space of capital (the colonies, "nature") where it can freely dump its waste, including the energetic and toxic waste of computational processes. [↗](#)
8. Franco "Bifo" Berardi, *After the Future* eds. Gary Genosko and Nicholas Thoburn (Baltimore, MA: AK Press, 2011), 35. [↗](#)
9. The working conditions at Foxconn factories are fairly well known, but mining conditions for tin and coltan in Congo are less well documented, as is the emergence of this brutal rare-earth industry in the footprint of rubber plantations. For more see Kevin Bales, *Blood and Earth: Modern Slavery, Ecocide, and the Secret to Saving the World* (New York: Spiegel & Grau, 2016). For an excerpt from the text, see Kevin Bales, "Your Phone Was Made By Slaves: A Primer on the Secret Economy," January 2016, accessed May 1, 2016, <https://blog.longreads.com/2016/03/08/your-phone-was-made-by-slaves-a-primer-on-the-secret-economy/>. [↗](#)
10. Pasquinelli outlines three determinations of metadata: "1. Metadata as the measure of the value of social relations....2. Metadata as implementation of machinic intelligence....3. Metadata as new form of biopolitical control (dataveillance)." Pasquinelli, "Italian Operaismo," 63-64, emphasis in original. [↗](#)
11. Randy Martin, "After Economy: Social Logics of the Derivative," *Social Text* 31, no. 1 114 (Spring 2013): 85. [↗](#)
12. Martin, "After Economy," 85. [↗](#)
13. See my essay, "Advertisarial Relations and Aesthetics of Survival," *NECSUS: European Journal of Media Studies*, June 3, 2013, accessed May 1, 2016, <http://www.necsus-ejms.org/advertisarial-relations-and-aesthetics-of-survival-advertising-advertisign/>. [↗](#)
14. Dallas Smythe, "Communications: The Blindspot of Western Marxism," *Canadian Journal of Political and Social Theory* 1, no. 3 (Fall 1977): 1-27. [↗](#)
15. Ariella Azoulay, *The Civil Contract of Photography* (New York: Zone Books, 2008), and Ariella Azoulay, *Civilian Imagination: A Political Ontology of Photography* (London: Verso, 2012). [↗](#)
16. Jonathan Beller, "Camera Obscura After All: The Racist Writing With Light," in "Feminist Media Theory: Iterations of Social Difference," ed. Jonathan Beller, special issue, *Scholar and Feminist Online* 10, no. 3, (Summer 2012),

<http://sfonline.barnard.edu/feminist-media-theory/camera-obscura-after-all-the-racist-writing-with-light/0/>. ↻

17. Roland Barthes, *Camera Lucida: Reflections on Photography*, trans. Richard Howard (New York: Hill and Wang, 1980). ↻
18. Azoulay, *Civilian Imagination*. ↻
19. Ariella Azoulay, “We,’ Palestinians and Jewish Israelis: The Right Not to Be a Perpetrator,” *South Atlantic Quarterly* 114, no. 3 (2015): 687-693. ↻
20. Paulo Virno, *A Grammar of the Multitude: For an Analysis of Contemporary Forms of Life* (Cambridge: MIT Press, 2004). ↻
21. Azoulay’s inspirational polemic infuses her recent books and interrogates the organization of photographic practices by state- and bourgeois cultural-formations and what might be called their ideological apparatuses—apparatuses that organize the use and reception of images and therefore appear as part of the photographic program. She pursues a significant distinction between what she identifies as “the paradigm of art” and “the paradigm of visual culture,” and boldly exposes the paradigm of art as a foreclosure of many of the radical potentialities of photography. The paradigm of art is 1) invested in a distinction between the aesthetic and the political, 2) configures a notion of sovereignty through the ideal of authorship, and 3) generates objects. Azoulay writes against the photograph as the aesthetic (or political) result of the sovereign subject photographer’s exercise of his creative intention, or, for that matter as the mere objective product of a machine process. Instead, under the paradigm of visual culture, she sees the photograph and photography fully embedded in the complexities of sociality itself. Thus a photographic event becomes a site of negotiation—an open archive—in which many stakeholders might have a say about various aspects of an image’s existence, or non-existence.

For our purposes here we could say that the dilation of the photographic event, which Azoulay argues is “never-ending” lays bear the photographic image as a worksite—a complex, distributed, multi-pronged, semiotic process essential to the production and reproduction of the world as we know it. (Azoulay, *Civil Imagination*.) The worksite that is the image is thus also a battleground.

Extrapolating from the centrality—or better perhaps, nodality—of the image we could say that in relation to images there is an imperative to perform, to virtuosity a la Paulo Virno, in as much as we mean a necessary adequation of the multiple relations between images, language function and social life. See Virno, *A Grammar of the Multitude*. In accord with Virno, one aspect of this generalized virtuosity clearly involves what Virno calls, the expropriation of the cognitive-linguistic, and, not incidentally what Berardi recognizes as attention deficit disorder, and Steigler sees as endemic short-termism and the grammatization of the senses (These pathological impositions, I would want to point out since it is oft forgotten, require the emergence of what I have called world-media-system to obtain). See, Virno, *A Grammar of the Multitude*; Berardi, *After the Future*; and Bernard Stiegler, *For a New Critique of Political Economy* (Cambridge, UK: Polity Pres, 2010). However, Azoulay’s embattled stance, and the massive efforts towards decolonization and anti-apartheid systems more generally, suggest that as quickly as avenues of practical activity are closed off (through expropriation and foreclosure) other scenes of struggle emerge. The subordination, subjugation, and subsumption of linguistic function under the image is always only partial and incomplete. Though organized by the reign of images, life forces both compose and contest each iteration, each utterance. ↻

22. Patricia Pisters, *The Neuro-Image: A Deleuzian Film-Philosophy of Digital Screen*

- Culture* (Stanford, CA: Stanford University Press, 2012), 298, addition mine. ↗
23. Pisters, *The Neuro-Image*. ↗
  24. See Berardi, *After the Future*; and Mattero Pasquinelli, “Immaterial Civil War: Prototypes of Conflict with Cognitive Capitalism,” in “Policies: A Critique of Creative Industries,” European Institute for Progressive Cultural Politics, November 2006, accessed May 1, 2016, <http://eipcp.net/policies/cci/pasquinelli/en>. ↗
  25. Hito Steyerl, “The Poor Image,” in *The Wretched of the Screen* (Berlin: Sternberg Press, 2013). See also Jonathan Beller, “The Cinematic Program,” *La Furia Umana* 23 (April 2015); no page. <http://www.lafuriaumana.it/index.php/56-lfu-23/350-jonathan-beller-the-cinematic-program>. ↗
  26. On the plus side, for example there is ASMR or autonomous sensory meridian response, known more colloquially, if I am not mistaken, as AIHO: Attention Induced Head Orgasm—something purportedly possible to achieve just by looking. [https://en.wikipedia.org/wiki/Autonomous\\_sensory\\_meridian\\_response](https://en.wikipedia.org/wiki/Autonomous_sensory_meridian_response). Of course AIHO is not to be confused with IMHO, IMHO (“in my humble opinion”) – particularly during texting. ↗
  27. “Camouflage from Face Detection,” CV Dazzle, accessed May 1, 2016, <http://cvdazzle.com>. ↗
  28. For what promises to be a definitive text on these overlays see Benjamin Bratton, *The Stack: On Software and Sovereignty* (Cambridge, MA: MIT Press, 2015). ↗
  29. In the words of Lytro’s Eric Cheng, “Light field is the holodeck”—you can capture all of the light that comes into the lens of the camera and thus, by choosing what to focus on, create the visual experience of being there. (Paul Miller, “Lytro’s Eric Cheng on a Video Lytro: ‘There’s No Reason We Can’t,’” January 11, 2012, accessed May 1, 2016, <http://www.theverge.com/2012/1/11/2700845/lytros-eric-cheng-on-a-video-lytro-theres-no-reason-we-cant>). For a technical account light fields see, Chia-Kai Liang, Yi-Chang Shih, and Homer H. Chen, “Light Field Analysis for Modeling Image Formation,” *IEEE Transactions on Image Processing* 20, no. 2 (February 2011): 446-460. Also, see Note 30. ↗
  30. John Markoff, “At High Speed, on the Road to a Driverless Future,” *New York Times*, May 27, 2013, accessed May 1, 2016, <http://www.nytimes.com/2013/05/28/science/on-the-road-in-mobileyes-self-driving-car.html>. ↗
  31. Taking issue with some of my examples for being “admittedly sexy but ultimately disappointing,” Reader 1 of this essay for *Lateral* critically yet generously wrote,

“Why not consider socio-computational practices that seek to do for our attention economy what striking and (more radically) seizing the means of production has done for “traditional” laborers? Here I’m thinking of the Wikipedia “Spanish Fork” labor strike, which effectively forced Jimmy Wales and Larry Sanger away from their dream of a monetized, advertising-supported encyclopedia written by users to a non-profit version. In essence, the Spanish Wikipedians seized Wikipedian in the early 2000s, copying WP material to their own Enciclopedia Libre, forcing Wales to fire Sanger and abandon his Web 2.0 dreams of the exploitation of user labor. (This is not to say WP is perfect, by any means, but it is to say that here is a concrete instance of successful labor-centric resistance to the attention economy).

“Or consider efforts to make alternative social media systems, such as the decentralized Twister (which is built on blockchain technologies, so it might align with the author’s points about blockchains). Twister is the anti-Twitter: it is peer-to-peer; it cannot implement algorithms to shape our

streams (and thus what we pay attention to); it is free software so it cannot be dominated by its creator, Brazilian software engineer Miguel Freitas; it cannot be seized by any state; it denies the logic on Internet advertising by not tracking users across the Internet, nor selling their attention to marketers; it has an internal economy based on computational mining that allows users the ability to send “promoted posts” but segregates those posts into a separate stream.

“In both cases (Wikipedia Labor Strike, Twister) we have projects that aren’t speculative, theoretical, or subtle. They are actually existing efforts to resist the dominant political economy of attention capitalism.”

As I hope my long citation attests, I feel that these are noteworthy examples and I am pleased and indeed grateful to include them here. In response to the first draft of my essay, Reader 1 pointedly wrote, “I wonder why the old goal of seizing the means of (attention) production is off the table in favor of art projects and detouring through theory.” However, I would submit and have tried to clarify that neither art, nor theory, nor anything else, including idle speculation can properly be thought to be in and of themselves detours in the M-M’ circuit. These are all potentially pathways of valorization and can be transformed in multiple ways. Seizing the means of production certainly includes hardware (fixed capital), but also practices, ideas and, vexingly, one’s own mind—in short, nearly all that goes under the sign of “culture.” I sometimes refer to this cultivation of a reorganization of attention in relation to discursive acts as “the politics of the utterance.” See my essay Jonathan Beller, “Wagers Within the Image: Rise of Visuality, Transformation of Labour, Aesthetics Regimes,” *Culture Machine* 13 (2012): 22. [↗](#)

32. Vilém Flusser, *Towards a Philosophy of Photography* (London: Reaktion Books, 2000); and Wendy Hui Kyong Chun, *Programmed Visions: Software and Memory* (Cambridge, MA: MIT Press, 2011). [↗](#)
33. Chun writes, “Media archeologist, Friedrich Kittler, taking this embedded and embedding logic to its limit, has infamously declared ‘there is no software,’ for everything, in the end reduces to voltage differences. More precisely he contends, ‘there would be no software if computer systems were not surrounded... by an environment of everyday languages.” Chun, *Programmed Visions*, 3, citing Friedrich Kittler, “There Is No Software,” October 18, 1995, accessed May 1, 2016, <http://www.ctheory.net/articles.aspx?id=74>. Chun says on page 2, “Based on metaphor, software has become a metaphor for the mind, for culture, for ideology, for biology and for the economy.” She adds, “Computers, like other media, are metaphor machines: they both depend on and perpetuate metaphors. More remarkably though, they — through their status as “universal machines”— have become metaphors for metaphor itself.” Chun, *Programmed Visions*, 55. Further breaking up the seemingly objective solidity of computation, Chun referred to the leakiness of computational machines in a talk entitled “To Be Determined” give at Pratt Institute on September 24, 2015. [↗](#)
34. Flusser, *Towards a Philosophy of Photography*. [↗](#)
35. Chun, *Programmed Visions*. [↗](#)
36. Stiegler, *For a New Critique of Political Economy*. [↗](#)
37. Tara McPherson, “U.S. Operating Systems at Mid-century: the Intertwining of Race and UNIX,” in *Race After the Internet*, eds. Lisa Nakamura and Peter Chow-White (New York: Routledge, 2011), 21-37. [↗](#)
38. McPherson, “U.S. Operating Systems at Mid-century,” 29. [↗](#)
39. “Shall we be forgiven for recalling that the father of information theory, Shannon,

creator of a rigorous mathematical framework for evaluating the cost of a message, was an employee of the Bell Telephone Company? This does not of course alter the scientific value of his theorems, but suggests to us the need to limit its extrapolations (to the mechanical universe). It is not a matter of indifference that in France the administration of the *Télécoms* (D.G.T., C.N.E.T., etc.) should have been the principal source of financing and sponsorship of communication studies—conferences, seminars, chaired professorships, journals and other publications. That is not to diminish their merit, nor the intense interest they generate. But such is the hold means exert over ends, and machines over minds, that an unconscious ‘halo effect’ encourages us from those quarters to hallucinate the cultural history of human beings through the prism of the *Postes et Télécom*. A receiver, a wire, a signal. ‘Hello, I hear you...OK, received your message, good-bye.’ In more or less elaborate forms, this schema underlies ‘*the act of communication*,’ a central unit of its reasoning.” Regis Debray, *Media Manifestos: On the Technological Transmission of Cultural Forms*, trans. Eric Rauth (London: Verso, 1996), 42. ↗

40. McPherson, “U.S. Operating Systems at Mid-century,” 31. ↗
41. Ibid., 35. ↗
42. Max Kalehoff, “Rising value of Facebook Brand Fans Validates Social Marketing Investment,” Syncapse Blog, April 17, 2013, accessed May 1, 2016, <http://www.syncapse.com/rising-value-of-facebook-brand-fans-validates-social-marketing-investment/#.UXWI74KhDq7>. ↗
43. Michael D. Ryall, “The New Dynamics of Competition: An Emerging Science for Modeling Strategic Moves,” *Harvard Business Review* 91, no. 6 (June, 2013): 80-87. ↗
44. Julian Assange, “The Banality of ‘Don’t be Evil,’” *New York Times*, June 2, 2013, SR4. ↗
45. Drawing on the attention theory of value, I published explicitly on the expropriation of screen labor by internet companies in 2001. See my essay, Jonathan Beller, “Third Cinema in a Global Frame: *Curacha*, Yahoo!, and *Manila by Night*,” *positions: east asia cultures critique* 9, no. 2 (2001): 331-367. ↗
46. With regard to state function, including warfare, extrajudicial rendition, and torture, Allen Feldman refers to “dismediation” and “apophatic blurring.” See Feldman, *Archives of the Insensible*. ↗
47. Note: I am grateful to Stephanie Boluk for bringing these renderings to my attention. ↗
48. Neferti X. M. Tadiar, “Life-Times in Fate Playing,” *South Atlantic Quarterly* 111, no. 4 (Fall 2012): 783-802. ↗
49. Paul Virilio, *Speed and Politics* (Los Angeles: Semiotext(e), 2006, 1986). ↗
50. For an excellent analysis see, Max Haiven, *Cultures of Financialization: Fictitious Capital in Popular Culture and Everyday Life* (London: Palgrave MacMillan, 2014). ↗

#### Bio



#### Jonathan Beller

Jonathan Beller is Professor of Humanities and Media Studies at Pratt Institute. Books and edited volumes include *The Cinematic Mode of Production: Attention Economy and the Society of the Spectacle*; *Acquiring Eyes: Philippine Visuality, Nationalist Struggle and the World-Media System*; and *Feminist Media Theory* (a special issue of *The Scholar and Feminist Online*). Among his current book projects are *The Programmable Image* and *The Message is Murder*. Beller has been a fellow at the Barnard Center for Research on Women and Gender, serves on the editorial collective of *Social*

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