

Tiernan Hart**The Online/Offline Distinction Will Dissolve****1. Introduction**

The term ‘on-line’ and its contrary ‘off-line’ refer to states of connectivity relating to the use of telecommunication. Before the internet, both terms were employed regarding the use of telegraphs and telephones to metaphorically describe a connection between people mediated by the wires transmitting the signal. With wireless telecommunication this distinction was persevered as a turn of phrase because it still invokes the spatiotemporal novelty of ‘being somewhere else’ via telecommunication. For the online/offline distinction to dissolve means that ‘getting out’ of information systems can no longer be done. With the rapid advancement and proliferation of the internet as a unifying domain, more aspects of life are reorganized by information systems, such as online shopping, banking, emailing, socializing, and the digitization of work through remote work and cloud computing technologies such as Salesforce. A society that gets reorganized according to a higher level of interconnectivity is one that by-passes traditional limitations such as spatial confines of interpersonal relationships, or the temporal requirements of having to travel to physical locations such as libraries or banks. This metamorphosis is one that most everyone is aware of as either the “age of big data”, “information age”, or diagnosing rapid technological development as the fourth industrial revolution: “Industry 4.0” (Chunguang 2020). Rather than contributing to periodizing this as a new age itself, I intend to investigate how such a shift undermines traditional distinctions which hence characterize the new period. The online/offline distinction is firstly a distinction of time and space: one engages in online activity at a time in a place before closing the laptop or cellphone and returning to the “real world”. In this essay, I argue that this assumption will dissolve because the technological break of information technologies reorients space and time and subsequently by-pass any spatiotemporal confines that separate online from offline.

Bernard Stiegler’s concept of ‘technics’ serves as a strong point of departure. Technics is a mode of relationship involving any technological object or prosthetic, and the domain of technique or skill that couples with the technical object to produce “secondary material” (Stiegler 1998: 93). For example, the saw and the carpenter couple to transform lumber into a baseboard. Consequently, technics becomes a domain wherein human society and memory is exteriorized or materialized in technology (Roberts 2012: 5). In fact, in constituting memory, technics constitutes time. In materializing or

mediating society, it structures space. Since new media technologies are fundamentally novel technologies that are diffused throughout contemporary life, we are arriving at an interesting set of problems regarding temporal and spatial restructuring.

In the first portion of this essay, I discuss literature from the field of geographic information systems (GIS). Specifically, location-aware cell phones, hybrid space, and the image as a digital object. The second section concerns the work of Vilém Flusser and his concepts of the technical image and the apparatus. Throughout these two sections, we arrive at some insights as to how the internet and the technical image generally produce new temporalities and spatialities. Namely, linear time is replaced by circular time, and ‘physical’ space converges with ‘cyberspace’ forming a hybrid space. Lastly, I discuss the economic utility of information. Romeo Alquati’s concepts of ‘valorizing information’ and ‘cognitive capitalism’ highlight the marriage of information systems with the capitalist mode of production. The parallels between the development of capitalist production and information systems resonate in a way that underlines the general condition of modern social life.

2. Hybrid Space

Smartphones are “smart” due to the information communication technologies (ICTs) in the phone that allow them to be unified in a network and share data at extremely high speeds and volumes. This includes location awareness, or the smartphone's capacity to geotag photos, videos, and passive location. The purpose of gathering this type of information or metadata is to incorporate and display them via GIS mapping. A relevant example of this is Google Maps, which codifies the positional data of a user’s ‘location’ onto a digital map. The digital map corresponds to the physical geography in real-time, and consequently is used to structure experience and navigation of that space (Leszczynski 2016: 732). GIS mapping of our real-time location is often relied upon for spatial navigation as well as exploration; location-aware phones can immediately inform one of nearby shops which might not otherwise be known. Geotagging and its digital processing underwrite all of these kinds of “real life” relations such that serendipitous interaction now happens due to the ‘chance’ of digital operations. Locational data is used by dating apps, job searches, and all social media “to facilitate spontaneous connections between individuals by alerting them to nearby contacts of potential interest based on their spatial proximity” (ibid.: 734). Relations in space are seen as relations between users and content. Likewise, the significant ‘place’ is first represented digitally as location. Space can be seen as if it were intermeshing

physical reality and virtual/cyber significance. The result of this duality could be called ‘hybrid space’, following de Souza e Silva and Firth (2012).

The notion of hybrid space has interesting implications for social phenomena such as identity, which often takes for granted its generative spatiotemporal milieu. Indeed, if we assume a non-religious (or non-transcendent) view of identity, then we assume that identity is a result of events that *happen* in space and time, combining social, natural, and psychological actualities (Schwartz & Halegoua 2015). If space is a condition for identity, the way space gets spatialized is important to consider. Schwartz and Halegoua produced the idea of the “spatial self” to portray how identity occurs in hybrid space. While individuals perform stylized acts in space as a means to form their identity, equally so do they *choose* to represent these spaces online for the same reason. Choosing which spaces to represent themselves in and which to exclude is like curating an exhibit, and the self is the quilting point or central node in a network of various spaces and activities aggregated in the ‘profile’: “Expressing ‘where you are’ over a social network does not solely inform others of your location, but may also signal mood, lifestyle, or life events” (ibid.). But of course, identity forming activities don't happen independently, these activities are first learned as methods of expression and communication. A stylized exhibition of space by one can spur the interest of others, not necessarily to re-represent the space online—though this is often the case—but first, the stylized exhibition of the space and its tie to the person exhibiting it imbues the space with a quality that someone else might then seek to experience by physically visiting the space. The ongoing computational process that mediates the cycle of representing and experiencing certain spaces traces the generative paths of the spatial self.

Networks of spatial selves emerge through shared digital externalizations. People render various spaces into their online profile via image/video. Space hence becomes the medium for relationships not only in the sense that people can bond over shared experiences, but the space itself as image becomes the language through which a person can vocalize an expression. Schwartz & Halegoua explain that “the spatial self is a way to gain access to personal and collective memories and a way to share and display these memories in order to connect with others” (ibid.). This invokes the earlier discussion on technicity. Memories and social ties are externalized into the digital, and in turn, these digital traces provide new avenues for socializing and formalizing identities. The externalization of technicity is equally spatial and temporal: technical objects occupy a physical space which modulates how one might move and interact with space, and in turn how social habits might form. But with internet phenomena, the objects are described as ‘virtual’ because they are images, files, bits of data—in other words, non-spatial.

This leads us to the notion of “digital objects” as proposed by Yuk Hui, a student of Stiegler, which may provide insight into how a new class of objects arises out of a new spatiality. Hui states “digital objects ... are data objects formalized by metadata and metadata schemes, which could be roughly understood as ontologies” (Hui 2016: 26). The ontologies/metadata schemes are what concretize data into digital objects by materializing them in relation to classes, categories, and other information schema programmed by the computing system. Hui compares this to the role that Kant’s categories play in cognizing the object by synthesizing sense data with *a priori* concepts of the understanding (ibid.: 34). This analogy with Kant can extend to spatiality; space is a pure form through which appearances are intuited. For something to be sensed as “outside us”, it must occupy a space (Kant 1999: A27/B43). The digital object, such as an image, appears as an ephemeral feature passing on the screen. But equally apparent is the expression of the image, i.e. representing something in a space that exists somewhere else. Hui states that digital milieus have no space but only relations (Hui 2016: 242-243). However, when one space is reproduced in another via imaging, the milieu is not purely digital; it is hybrid. While it is true that space is de-spatialized via the image and its digital relations, this is only so it can be re-spatialized when it appears on screen somewhere else.

If space is the milieu that provides coherence to distinct entities and movement – insofar as it contains them – then as Flusser points out, the speed at which electronic devices operate (the speed of light) de-coheres space as such. He says, “the speed of light makes all space (reality, possibility, impossibility) coalesce on the screen’s surface, at the point of ‘here’” (ibid.: 128). Limited physically only by the speed of light, digital operations traverse any spatial confines. Light does not occupy space in the strict sense, instead it energizes or illuminates space. Space may be the precondition for cognizing the object, but light is the precondition for cognizing space. As a result, new uses of light vis-à-vis digital technology reorganize space according to the program of the apparatus; from the camera itself with its aperture and shutter, to more advanced digital assemblages and their metadata schemes furnishing the Huiian digital object. Hybrid space and its corresponding milieu reveals a reworking of space. The a-spatiality of the digital suffuses the presumably pure spatiality of the physical. Hybrid space is capable of folding various spatialities, mixing them into the “here” on the screen. Now, space gets “envisioned” by person-apparatus coupling. In other words, it is rendered perceptible: “the whirling particles around us and in us must be gathered onto surfaces; they must be envisioned” (Flusser 1985: 31).

3. Diachronic Time

In the first section I argued that digital technologies externalize space in a new way, as described by 'hybrid space'. This section makes a similar argument regarding time, through Flusser's technical image as the site whereupon disparate temporalities (and spatialities) are rendered. The genesis of the technical image begins with the apparatus, such as the camera. The world from the standpoint of the apparatus is merely a flux of photons. The indifferent stream of disintegrated particles have no meaning and are only a mass to be calculated (ibid.: 16). This calculation happens between the technological operations of the apparatus which proceed 'blindly', and human 'envisioning' as mentioned at the end of the previous section. This procedure reveals a mixing of apparatuses and people. Not privileging either party, this mixture instead reveals the apparatus to be a function of the person as much as the person is a function of the apparatus. Flusser states: "The apparatus does as the photographer desires, but the photographer can only desire what the apparatus can do. Any image produced by a photographer must be within the program of the apparatus ... That is to say, then, that not only the gesture but also the intention of the photographer is a function of the apparatus" (ibid.: 20)

Though it seems that the camera operator has a higher degree of agency since they are the one who triggers the apparatus, Flusser finds this to be more like a dependency. The image becomes more like people want, but that is only so people can be more like the image (ibid.: 54). This point is revealing. On the one hand, the apparatus resembles the function of anticipatory feedback, as originally described by Norbert Wiener in *Cybernetics*. Shooting with the camera is comparable to Wiener's example of shooting a flying duck, where one anticipates movement and attempts to minimize error in their successive attempts to predictively shoot the duck in its course (Wiener 1969: 113). For Flusser, the photographer isn't trying to minimize error, but they are instead attempting to capture a viewpoint within a *Gestalt* of time and space: the *a priori* factors of the scene as categories of time and space that they consider when making a decisive gesture in attempt to capture a certain viewpoint. (Flusser 2012: 198). On the other hand, there is a negative feedback loop at work which is larger and more limited. Wiener's example of negative feedback is that of stabilizing temperature (Wiener 1969: 96). An AC system reads the temperature of a room then activates, blowing hot/cold air to return the temperature to whatever it is programmed to be. Wiener also places voluntary action in this domain insofar as it navigates the contingency of external forces (ibid.). One may choose the temperature, but only within the range of available options. Likewise voluntary action can only occur according to socially informed intentions that pre-shape the course of action.

A significant difference between negative feedback and anticipatory feedback is found in the role time plays. The temporality of anticipatory feedback is of the moment or instant. It occurs in the chaotic ‘now’, and the attempt to achieve a goal amid an erratic becoming. A ceaseless myriad of environmental factors is at work which one must compensate for in ‘real time’ by thrusting into the future, guided by anticipation. The temporality of negative feedback is of a period which closes itself off. The end (stabilization) is inscribed into the disequilibrium that incites the stabilizing action. Both feedback types could be present at once depending on the system’s conditions. For Flusser, the system of the technical image–person circuit is semi-closed. Flusser illustrates this with a fantastic simple example: “the image shows a political party for which it wants us to vote, and we want the image to show us the party because we want to vote for it” (Flusser 1985: 55). At first this resembles negative feedback, but Flusser is quick to dispel this notion. Since, if it were able to be closed, the only direction it would move towards is decay and entropy. Therefore, the image receives feedback from elsewhere: culture, science, history, or the events of life both present and past (ibid.: 55-56). The event-image feedback is equally prevalent, as more events become images, images become the events themselves. The technical image fastens events, hindering the sequential passage of one to the other.

This change is monumental. For Flusser, the advent of the technical image breaks the one-dimensional linearity of history. Years before Francis Fukuyama, Flusser pronounced the end of history, not as a political outcome, but as a technical evolution towards post-history. This is because, for Flusser, history is a linear consciousness that is structured by the externalization of linear text. “Texts produce history by projecting their own linear structure onto the particular situation” (ibid.: 58). But technical images and their two-dimensional circularity dissolve linear writing and its corollaries such as truth, meaning, and hence linear history. Here is an interesting distinction between Flusser and Stiegler. Mark Poster argues in his introduction to *Into the Universe of Technical Images* that Stiegler ties media to the same material form of memory and time as he does to other technical objects. He describes it as “prostheses *for* the human,” as opposed to an assemblage of human–machine that denies linearity or privilege (ibid.: xviii). What follows Flusser’s recentering of technicity is a new format of externalizing culture and memory, and therefore a temporal break.

At first, the post-historical age of the technical image seems catastrophic, as if it prompts the dissolution of social institutions. But such an assumption fails to grasp the technical image’s contingent power to generate new institutions. In fact, we can never fully understand the technical image and its effects on society insofar as we reduce it to the operation of writing. Put differently, we presume writing’s traditional distinction of the true or false and judge technical images to be necessarily lacking

in truth. For example, we speak of misinformation, inauthenticity, or the unreality of the image. And the parasocial, or false sociality from the image. These accusations place technical images in the category of simulacrum or copy without original. This is opposed to pre-technical images such as paintings which do have copies and originals and can thus be reduced to the scale of true or false. But Flusser states that technical images move off this scale entirely. They have no originality since they are all reproductions, however, they are ‘faithful reproductions’ of the scene or milieu whose light rays the camera captures. Flusser elucidates this by saying “One can only doubt their ‘truthfulness’ in the same way that one might say, ‘I can’t believe my own eyes’” (Flusser 2012, 196). The true/false distinction gets undermined by the advent of the technical image because it necessarily preserves elements of both objective truth and illusion at once. The evolution from traditional image, to writing, and technical image reflect different modes of externalizing consciousness and therefore different formats of time.

The temporality of the technical image can be seen in circulation. In producing a technical image, the apparatus captures a ‘scene’, or milieu (*ibid.*), which is to say it de-temporalizes the moment whence the image is torn. This asynchronicity is only an appearance in the first instance, the feedback of the image–person circuit envelopes time insofar as the image circulates. Understanding the technical image then is not perceiving it as asynchronous, or outside of time, nor as synchronic or synthesizing the past and present moments. Instead, Flusser claims that we analyze the technical image as diachronic, or through time (Flusser 2012: 199). The technical image does not implicate the past and present as homogeneous moments, it instead establishes a rapport or communication between the present becoming and a generalized past in both their very heterogeneity. This generalized past is developed by the processual time of circulation. In the course of circulation, the present appearance depends upon the past in the form of the ‘complex of processes’ (*ibid.*: 196). From the mechanical operation of the apparatus to the technique of editing, or any metadata structures which places the image in any digital milieu. On the other hand, the past significance of the image gets altered by each passing present iteration. Each iteration appears in the vicissitudes of varying presents of time and place. This is similar to how an echo preserves a past moment only by modifying it through the present milieu, i.e. the acoustics of the walls that reflect sound. The technical image hybridizes the present, compressing its temporal processes into its moment of appearance, while simultaneously taking the image's significance to be spread across time. For the technical image, the eye “diachronizes the synchronically presented message” (*ibid.*: 199). In other words, one sees its circulation as a virtuality. The present and past rapidly chase each other by fact that each passing present is indexed into the past as an infinitesimal that is both produced by and producing the image’s continuing circulation (e.g. view

counts or any metadata measure). The diachronicity of the technical image retains all of its echoes as a generalized past. This temporal milieu is always virtually present in the image.

Thus, it is always a mistake to reduce a technical image to what it represents—to some asynchronous content—since it is the milieu that contextualizes its significance. Flusser elucidates this by showing how the Event is permuted by technical images. For an image to be an event, and an event to be an image both mean the same thing: that it gets dispersed. Rather than a thunderclap moment of the historical event which decides a before and after, the image-event propagates like a ripple in a pond. This metaphor highlights Flusser's geometrical distinction between a one-dimensional history and the two-dimensional image (Flusser 1985: 5). Like a ripple, the image-event topologically alters the surface, and instantiates itself everywhere insofar as it is an event. However, unlike the diminishing ripple, it can persist by establishing its own milieu: virtually acting upon further image circulation. This is the condition for the new kind of sociality Flusser identified with the technical image. Traditionally, objects would mediate the relations between people. The inverse is true for technical images that are mediated by people. People are socially classified by their technical images, e.g. television watchers (ibid.: 51). Hence, it is people who circulate as much as the technical image. This would point to the technicity of the technical image as the coupling between the image and the perceiver.

This circular temporality parallels the temporality of capital. The movement of Marx's formula $M-C-M'$ is a circuit, where the initial capital becomes valorized, producing a surplus that is subsequently fed back into the circuit. This circular temporality is punctuated by rates of returns, or rates of profits. In each case, the privileged moment—the payout—envelops the diachronic period of value production and potential circulation. Flusser's technical image provides valuable insight if we take it as an analogue for capital or money: the circulation which makes the image possible is directly implicated in it, making its circulation a perceptible quality. This kind of temporal folding grants money its image as a veritable *puissance* or power-of-action that represents what possibilities it can actualize through its exchange. It is in this sense that both the technical image and capital are concretizations of abstraction. The technical image is a concretization of abstract particles: light, and bits of information in the programmed apparatus. And capital and the commodity are a concretization of abstract value.

4. Valorizing Information

Matteo Pasquinelli's rediscovery of the work of Romeo Alquati provides an early connection between Marxism and cybernetics. Alquati observed labor practices and interviewed laborers at the Olivetti

factory to find that, as the machines would produce components of commodities, laborers would measure the machine's production in terms of amount produced, as well as various quality checks for error or inadequacies. The result of this field work is his idea of 'valorizing information'. This information served as a cybernetic mediator between constant and variable capital, or machine and laborer. It would be the basis on which laborers would intervene in the otherwise automated process of production. As such, it is the information and subsequent decision making that partially constitutes the valorization process (Pasquinelli 2015: 54). Pasquinelli states, "cybernetics unveils the machinic nature of bureaucracy and, conversely, the bureaucratic role of machines as they work as feedback apparatuses to control workers and capture their know-how" (ibid.: 55). This is reminiscent of Flusser's cybernetics, which describes the person's role as a functionary of the apparatus. The same is true here for Alquati and the person who is reduced to their "know-how" that is captured by the machine. Using the language of Flusser, the machines operate blindly to produce commodities and it is the person who 'envisions' the end state of the product, thereby laboring cognitively.

Information qua mediator of the human-machine circuit is thus equally subjective and material. This observation is vocalized by Hui's notion of interobjectivity, of which the defining characteristic is the materialization into data. Hui states, "[interobjectivity] refers to the materialization of both internal and external relations of objects. A general tendency of technology consists in the materialization of all sorts of relations by rendering what are otherwise invisible elements or aspects in visible and measurable forms ... materialized interobjectivities create their own milieux that connect both nature and artifacts" (Hui 2016: 160). Again, this process describes a new milieu that incorporates previously disparate states. Information that mediates between subjective and material operations forms a hybrid milieu where subjective decisions are materialized and machinic output gets subjectivized. In other words, the two form an interobjective system.

Although Hui never delves into the economics of interobjectivity, the discussion on valorizing information prepares us to do so. The thread running through both interobjectivity and valorizing information is a materialization of social relations. The laborer's measurements or calculative gaze as analyzed by Alquati is a social looking insofar as it was looking as labor. The commodity as defined by Marx is a materialization of social relations (Marx 1990: 128). Hence, Alquati's social looking gets crystallized into the commodity in the form of dead information as part of the valorization process. As commodities circulate, either to be used as constant capital or in the form of exchange for consumption's sake, they form interobjective systems. The machinery or material serving as constant capital or congealed labor are depended upon by the subsequent commodities produced. Additionally, the

exchange through the general equivalent of money forms a wider interobjectivity. Any object can be converted to money (whose objectivity could be physical or digital) and the use of money depends on what objects it can be converted into (*ibid.*: 229-230). From this point of view, the formula M-C-M' describes an interobjective system, since social relations are objectified into discrete yet interdependent objects that can be measured.

The traditional distinctions of capitalist metamorphosis (labor, circulation, and consumption) become indistinguishable from the point of view of the new regime Alquati called cognitive capitalism. Looking constitutes labor for Alquati. For Flusser, I argued that looking can be a form of circulation, folding various temporalities into the technical image. Lastly, we commonly consider looking as a form of consumption for so-called “image commodities” such as movies or YouTube videos. Therefore, cognitive capitalism reterritorializes the phases of capitalism to the eye and the image. Or in other words, the eye, image, and their exchange are axioms of a further abstracted process of value generation. A process that, much like the internet and its technical image, does not require any spatial or temporal synchronization to operate, due to interobjectivity and the materialization of constitutive social relations. Value begets value, despite no longer requiring physical workplaces and markets that exist in space and open and close at definite times. The digital interobjectivity of the market supplants the physical materialization. This is the market existing in a hybrid space. It can accompany its user anywhere and provide optimized recommendations tailored to them based on physical/digital information.

It would be a mistake to assume cognitive capitalism replaces industrial capitalism. It instead supplements industry, like how finance capital supplements industrial production. Cognitive capitalism is a first world capitalism where everyone contemplates images for their ‘job’, while the process of production happens “behind our backs” (Flusser 1985: 143). Jonathan Beller notes that one third of the people on the planet are systematically excluded, following Mike Davis’ idea of global apartheid. This global apartheid is a new form of global racism or racialization that maintains a global underclass despite any “postindustrial, postcolonial, postmodern, and ‘postracial’” (Beller 2021: 105). In a globally synchronized economy, dispossession happens at a massive scale, creating an ‘other’ out of this massive population who are rendered invisible under terms such as ‘slums’ or ‘third world’, and who find work only in “traditional” forms of capitalist production, i.e. industrial exploitation. Beller states that this invisible mass of racialized people is the dialectical antithesis to the media celebrity and the digital subject (*ibid.*). The digital subject and its abstract economies are made possible by the material dispossession of the global other. The former is what is perceived—and mediates social interaction—despite

the abstract emptiness underneath that only points to layers of frenetic economic circulation. On the other hand, the global other is never perceived, despite being the material reality that preconditions the former. Namely, the real exploitation and suffering in the manual labor processes for these new-age technologies. For example, Advanced-Connectek, a supplier for Apple, Amazon, Google, Microsoft, and Facebook has been found using forced labor in seven of its factories in west China (Lovejoy 2021). Further up the global supply chain is child slavery in cobalt mines in the Democratic Republic of the Congo, which provides 50% of the world's cobalt (Dimri 2022). Or one could look at the labor laws violated in Apple's supply chain in southern India due to underpay, irregular hours and poor work conditions (Ray 2020). Apple alone has closed 20 facilities due to these kinds of violations. The list could go on, but the point here is that the exploitation of industrial capitalism is still the norm, despite how 'technologically progressed' we tell ourselves we are. Additionally, the point is to reveal how new modes of value generation can emerge only as they depend on previous forms.

A higher level of global synchronization leads to a faster pace of processual evolution. There is a common critical tendency towards diagnosis: pinpointing new paradigms of the contemporary world that break with all that came before. Some of these diagnoses are better than others, but their explanatory power is not what is relevant here. Instead, I want to suggest that the rapid changes and their corresponding periods are the condition of this higher level of global synchronization. The technical image permuted the Event such that a continuous succession of periods or 'ages' is itself the stasis of modern life. Every event is always in the process of unfolding in its present circulation and imaging, because its circulation and imaging is its eventfulness: it aims to remain on the horizon of the present (Flusser 1985: 56). Image-events which situate themselves as a virtual center operate like an attractor state, congealing information that falls into orbit. Of course, this is directly comparable to congealed value in the commodity, whether that value be from information or 'traditional' labor is irrelevant, in either case the object which becomes the commodity does so by situating itself on the horizon of the present—that is, it circulates. Capitalist process being further abstracted to a cognitive capitalism parallels the further abstraction of social space and time, since they are reciprocal movements of decoding and ceaseless becoming inherent to modernity.

References:

- Beller, Jonathan. (2021). *The world computer: derivative conditions of racial capitalism*. Duke University Press.
- Chunguang Bai, Patrick Dallasega, Guido Orzes, Joseph Sarkis, Industry 4.0 technologies assessment: A sustainability perspective, *International Journal of Production Economics*, Volume 229, 2020, 107776, ISSN 0925-5273, <https://doi.org/10.1016/j.ijpe.2020.107776>. Accessed 04/06/2024.
- De Souza e Silva Adriana, Frith Jordan (2012) *Mobile Interfaces in Public Spaces: Locational Privacy, Control, and Urban Sociabilty*. New York: Routledge.
- Dimri, Amogh. (2022). *Child Labor and the Human Rights Violations Embedded in Producing Technology*. *Columbia Undergraduate Law Review*.
<https://www.culawreview.org/journal/child-labor-and-the-human-rights-violations-embedded-in-producing-technology> Accessed 02/28/2024.
- Flusser, Vilém (2012). Towards a theory of techno-imagination. *Philosophy of Photography*, 2(2), 195–201. https://doi.org/10.1386/pop.2.2.195_7 Accessed 02/28/2024.
- Flusser, Vilém (2012). Towards a theory of techno-imagination. *Philosophy of Photography*, 2(2), 195–201. <http://dx.doi.org/10.3898/NEWF.77.01.2012> Accessed 02/28/2024.
- Flusser, Vilém (1985). *Into the Universe of Technical Images*. University Of Minnesota Press.
- Hui, Yuk. (2016). *On the Existence of Digital Objects*. University Of Minnesota Press.
- Kant, Immanuel. (1999). *Critique of Pure Reason*. Cambridge University Press.
- Leszczynski, Agnieszka. (2015). Spatial media/tion. *Progress in Human Geography*, 39(6), 729-751. <https://doi.org/10.1177/0309132514558443> Accessed 02/28/2024.
- Lovejoy, Ben. (2021, May 10). *Seven Apple suppliers in China allegedly using forced labor through state-run programs*. 9to5Mac.
<https://9to5mac.com/2021/05/10/seven-apple-suppliers-allegedly-using-forced-labor/> Accessed 02/28/2024.
- Marx, Karl. (1990). *Capital: a Critique of Political economy*. / Vol. 1. Penguin In Association With New Left Review. (Original work published 1867) *Media Theory*. *New Formations* 77, 8–20.
- Pasquinelli, Matteo. (2015). Italian Operaismo and the Information Machine. *Theory, Culture & Society*, 32(3), 49-68. <https://doi.org/10.1177/0263276413514117> Accessed 02/28/2024.
- Ray, Sildaitya. (2020). *Report: iPhone Factory in India Committed Multiple Labor Violations, Underpaid Wages*. Forbes.
<https://www.forbes.com/sites/siladityaray/2020/12/18/report-iphone-factory-in-india-committed-multiple-labor-violations-underpaid-wages/?sh=4772e0df527f> Accessed 02/28/2024.
- Roberts, Ben. (2012). Technics, Individuation and Tertiary Memory: Bernard Stiegler's Challenge to Media Theory. *New Formations*. 77. 8-20. 10.3898/NEWF.77.01.2012.
- Schwartz, Raz., & Haleboua, Germaine R. (2015). The spatial self: Location-based identity performance on social media. *New Media & Society*, 17(10), 1643-1660. <https://doi.org/10.1177/1461444814531364> Accessed 02/28/2024.
- Stiegler, Bernard., Beardsworth, Richard., & Collins, George. (1998). *Technics And Time / Vol. 1, The Fault of Epimetheus*, Transl. [From The French] By Richard Beardsworth and George Collins. Stanford University Press.
- Wiener, Norbert. (1969). *Cybernetics: or Control and Communication in the Animal and the Machine*. MIT Press