

Nonsense Data and the Anarchive: Memory in Real-Time

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A cascade of audio-visual movement flickers across three juxtaposed screens. Rapid streams of fragmentary moving images are on display, each frame displayed just long enough for the audience to identify them (as Hollywood blockbusters, pornography, documentary footage, etc.). What is shown are files being transferred via The Pirate Bay, a peer-to-peer (P2P) file-sharing platform, from where the transmissions are intercepted and displayed in real-time. After watching this disorienting flow of fragmentary cinematic imagery for a while, it begins to take on a montage-like feeling, and patterns begin to emerge from the streams. Footage from the same sequence of a film shows a processual continuity in the audio-visual stream, and aesthetic similarities produce a sense of cohesion across genres (e.g. lighting in porn and music videos). The audio-visual content is, however, not the only data made available to the human sensorium. Highly pixelated frames, ghostly appearances from other frames, and stuttering repetition of the same frames reveal the temporal ordering of data being transmitted across distributed networks. Additionally, geolocation and the IP addresses of the devices are revealed (sender and receiver) – involved in the somewhat unauthorized file-sharing. These abundant streams of data constitute *The Pirate Cinema*, a multimedia art installation by Nicolas Maigret, which presents a view into the multiple spatiotemporal realities that traverse and inform real-time networks.

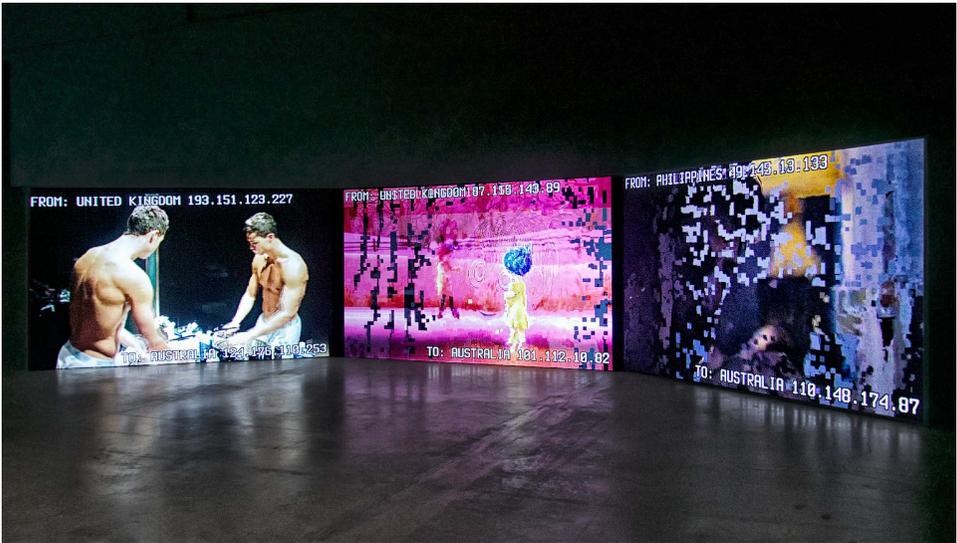


Figure 1. *The Pirate Cinema*, Nicolas Maigret, 2012.
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According to its creator, *The Pirate Cinema*'s fragmentary and glitchy data stream “depicts the topology of digital media consumption and uncontrolled content dissemination in a connected world” (thepiratecinema.com). This chapter addresses such disorderly movements and temporalities of digital networks in order to examine how social memory is enveloped in and produced through the immediacy of networked signal transmissions. I argue that real-time data processing has effectuated an *anarchival* amplification, where information is continuously reorganized and thus obliterated in order for it to be preserved. This presents a radical shift from conservative modes of preservation in print culture to generative digital archiving in network culture, where new informational compositions are made possible with each micro-temporal execution of code. Anyone with an internet connection can access, produce, publish, modify, and relay digital imagery in the immediacy of lived experience. This means that individuals, groups, and organizations are increasingly under pressure to produce sense from excessive streams of data that permeate and overflow the World Wide Web (WWW). Sense-making is thus increas-

ingly enmeshed in socially modulated signal transmissions rather than culturally anchored in centralized institutions, which leads to a relaying of affects and values in an unruly fashion.

The aim of this chapter is to propose the anarchival as a concept for understanding the dynamic and abundant potentialities immanent to real-time networked technologies, and how technology may be designed and operationalized anarchivally.¹ Through an analysis of *The Pirate Cinema* (2012) and of Mark Hansen and Ben Rubin's multimedia art installation *Listening Post* (2002), the chapter scaffolds an understanding of the anarchival as a dominant force in contemporary sense-making procedures. I primarily build on Jacques Derrida's (1995) original conception of the anarchival, which is used to designate the selective operation in archivization, where some things must be discarded in order to prevent information overload (you cannot capture all aspects of everything). The archive and the anarchival are thus simultaneous and co-constitutive in processes of preserving (and forgetting) memory of the past. More recently, the anarchival has been used somewhat cursorily, for example by Wolfgang Ernst (2013) and Kjetil Jakobsen (2010), to explain the unruly processes of the Internet. From a different perspective, Alanna Thain (2010) has explored mobile technology's potential to produce 'anarchival cinema' by intensively extending perception in an immediate redoubling "of what is perceived with an intensive awareness of the shadings and modulations of an immersive environment" (Thain 2010, 57). While Ernst's and Jakobsen's accounts of the anarchival are primarily technically oriented, Thain's examples are limited to perceptive augmentation through 'canned' recordings. In this chapter, I propose to understand the anarchival in relation to the 'live' streams of information that flow across the WWW with multiple—and sometimes contradictory—claims to truth.

The analyses of *The Pirate Cinema* and of *Listening Post* shows how the intensification and distribution of presents in network culture holds the potential to produce more than habitual responses to the increasingly indexed and accelerated interfacial encounters across real-time networks. The works are identified as what Gilles Deleuze (1989) terms 'peaks of present,' and they are analyzed according to their reconfiguration of the potential for data to be perceived otherwise. The chapter thus aims to move beyond the signifying order of the traditional archive to understand contemporary ways of preserving memory as fundamentally disor-

derly. This leads to a discussion of the potential for real-time interfaces to modulate how events are remembered and shared. In short, the chapter will focus on the process of making sense from the abundant streams of nonsense data that inform contemporary human-computer interactions.

TEMPORAL DISORDER

On *The Pirate Cinema*'s website, a 'nota bene' is inserted in continuation of the textual project description:

NB: Downloading Torrents is not a linear process. Completion of a file is done in a disorderly manner, and according to an irregular rate. Which leads, in the context of this project to a rearrangement of the full temporal continuity of initial video and sounds (*The Pirate Cinema*).

It does not take long to discover that cinematic narrative is not paramount to the experience of watching *The Pirate Cinema*.² Although each frame intercepted by the project is displayed in sequential linearity, one is not immersed into the continuity of cinematic experience. Instead, the project grants insight into the multilinear operations of the BitTorrent protocol, which is often used to distribute large files through P2P networks.³ This differs from traditional modes of communication, where content is transferred from one location to another in a linear manner (e.g. the postal worker delivering a package). The project thus offers a glimpse into the operational machinery of what may be designated the "archive in motion," which signifies network culture's perpetual transfer of data through micro-temporal executions of programmed code (Røssaak 2010). The proliferation of networked and mobile technologies with real-time access to data archiving and processing has entailed what Wolfgang Ernst describes as *a deconstruction of linear time*:

Memory has become a function of immediate access to data storage centers, while, in turn, the present becomes radically temporalized (even micro-archived) in dynamic realtime data processing (Ernst 2018, 172).

This focus on immediacy is a reiteration of Ernst's earlier work, where he argues that technological developments have obliterated the traditional separation between transmission media and storage media (Ernst 2013). According to Ernst, the archive—both as technical storage and as historical discourse—has radically changed from documentary stills to algorithmic dynamics, which means that the classical notion of the archive "becomes

literally metaphorical, a function of *transfer* processes” (Ernst 2013, 98, italics original). As software and hardware is constantly being updated and replaced, and information is generated as a result of programmed executions of code, neither the medium nor the message remains the same.⁴ In effect, a shift from static representation of the past to perpetual data archiving has been brought about in the transformation from print culture to network culture. The macro-temporality of the traditional archive is superseded by the micro-temporality of computational processing. From a techno-cultural perspective, this implies that the meaning of an archive is no longer just a historical narrative constructed through the image of the nation state, but is today rather *ahistorical* in its perpetual processing of data in generative information networks. One can say that the contemporary archive suffers from *short-term memory*. The distinction between historical and ahistorical modes of preserving memory can be further described through Gilles Deleuze and Felix Guattari’s argument that “short-term memory is of the rhizome or diagram type, and long-term memory is arborescent and centralized (imprint, engraving, tracing, or photograph),” whereby “[s]hort-term memory includes forgetting as a process” (Deleuze & Guattari 1987, 16). While it may seem that the ever-expanding databases of digital culture capture and preserve for eternity, they are in fact perpetually reorganizing, and thus obliterating, memory (as long-term cultural memory). For instance, services such as Netflix or Google’s search engine continuously reorganize content based on prior interactions. The Time To Live mechanism assigned to data packages transmitted via the internet is another example of the (a)liveness of digital data, which defines a certain amount of time(s) the data can be transmitted before its authentication expires.⁵

It is by no means a new idea that the archive would not exist without a double movement involving both a technique of remembering and a technique of forgetting, of inclusions and exclusions, preserving and erasing memories of the past; in short, the archive and its anarchive. However, when the archived past is no longer preserved and ‘frozen’ in its contemporary condition but perpetually rewritten and reorganized, it is difficult to uphold a general distinction between past, present, and future. The time frame for information to travel across the globe is no longer a matter of weeks, minutes, or even seconds, but is reduced to the blink of an eye. As transmission time is often imperceptible to the human sensorium, it brings a feeling of ‘liveness’ to the perception of media (Auslander 2012),

hence the need for the designation *real-time*. For instance, in a video call between two devices with a relatively good internet connection, we do not experience the distance the signals must travel in order to be received, since this temporal gap is minimized, even made imperceptible, by real-time processing. The real-time operations of contemporary technologies thus introduce new ways of relating to not only space, but also to time, where both space and time are negotiable and subject to modifications. The continuity of chronological time is no longer measured in relation to space (the time it takes a body to traverse a known distance). Both time and space have become abstracted or cut off from their physical manifestations. In real-time, we can experience the intensity of an extended now, since two spaces—for example, spaces of production and reception in older media—that could never actually meet in a physical sense can both ‘meet’ and exchange information in a signaletic sense in real-time. The delay of reproduction time in older media has been cut out and compressed in the almost instant distribution in digital media.

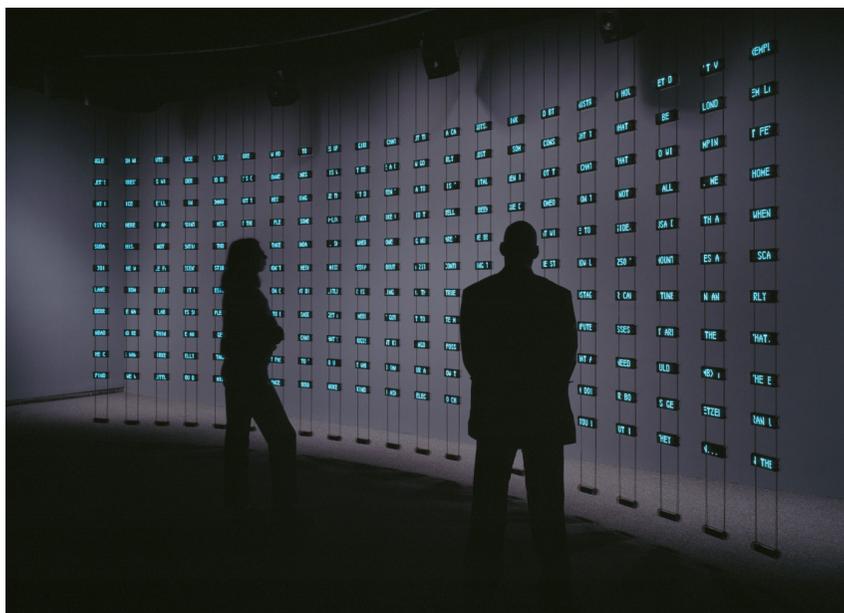


Figure 2. *Ear Studio*, Ben Rubin, 2002. All rights reserved.

REAL-TIME DISTRIBUTION OF PRESENTS

Mark Hansen and Ben Rubin's multimedia art installation *Listening Post* explores these extended presents by dynamically conveying text fragments from thousands of conversations on bulletin boards, chat rooms, and other online forums all over the WWW. Algorithms monitor these torrents of simultaneous conversations on various forums and automatically harvest data based on whether they include phrases such as "I am" or "I like" (e.g. "I'm bored" or "I am not repeating"). In real-time, these text fragments are then displayed in six different 'scenes' (e.g. all "I am"-phrases constitute a scene) through a suspended grid of 200+ small electronic displays, and some are read aloud using text-to-speech synthetization.

According to the creators of *Listening Post*, the aim of the project is to render the collective "murmur" of social interaction in online networks accessible:

A participant in a chat room has limited sensory access to the collective "buzz" of that room or of others nearby—the murmur of human contact that we hear naturally in a park, a plaza or a coffee shop is absent from the online experience. The goal of our project is to collect this buzz and render it at a human scale. [...] Topics emerge in response to current events and daily activities in cycles that vary hour-to-hour, day-to-day, and season-to-season. The emergence of these topics transcends the boundaries of the online landscape: a local knitting circle in Australia and a political discussion group on Yahoo may both react to news of a political scandal or a world cup victory. Our goal is to distill the content and the structure of this collective communication and to present it in ways that are accessible and compelling (Hansen & Rubin 2002, 1).

At first, an encounter with the installation does not necessarily make sense. It rather conveys a chaotic stream of utterances with no immediate relation to one another apart from their syntactical structure (e.g. "I am..."). From the seemingly incoherent streams of fragmentary texts, patterns emerge as what the creators call 'topics' in the above. These topics are, however, not apparent in the immediacy of the interfacial encounter, but may appear as one reflects upon the events that might have triggered such reactions in online forums. For instance, the installation might be hit by a wave of euphoric expressions in the aftermath of a world cup victory, but unless you already know the game is being played, the connection can only be made in retrospect. Simultaneously, and in parallel with this rise of euphoria, a second wave of despair might be caused by reactions from supporters of the losing team; and neutral spectators might react to

scandalous scenes of violent commotion in the crowd, thus causing yet a third wave to rise from the stream of fragmentary texts; and so forth. Such reactions do not appear as readymade narratives, in fact, they do not even appear as reactions, before the individual spectator perceives them as such by pulling together the bits and pieces of data. *Listening Post* can be seen as a form of collaborative storytelling with input from a diverse range of sources that are assembled and processed through a sensing body. The perceived correlation between these fragmentary texts is not given but rather produced in the affective immediacy of the interfacial encounter.

The information conveyed through *Listening Post* in no way presents a continuous and linear narrative with claims to truth. Instead, fragmentary texts pulled from multiple sources of origin presents the spectator with a discontinuous and multilineal stream of data calling for an imaginative production of sense; i.e. to generate meaning from the data. The collective ‘buzz’ or ‘murmur’ Hansen and Rubin wish to transmit through *Listening Post* is essentially nonsense. *Listening Post* does not present spectators with a ‘truthful’ narrative of what people around the world are discussing. By truthful I mean in the sense that they would have been able to generalize and find topics based on the huge data corpus they pull from thousands of online conversations. Such reductive condensation of data would be the normal aim of data analytics. Instead, the operation strategy of *Listening Post* can rather be seen as an example of what Gilles Deleuze terms a “power of the false”:

A new status of narration follows from this: narration ceases to be truthful, that is, to claim to be true, and becomes fundamentally falsifying. This is not at all a case of ‘each has its own truth,’ a variability of content. It is a power of the false which replaces and supersedes the form of the true, because it poses the simultaneity of impossible presents, or the coexistence of not-necessarily true pasts (Deleuze 1989, 131).

Deleuze more generally refers to the “simultaneity of impossible presents” as “peaks of present” and the “coexistence of not-necessarily true pasts” as “sheets of past,” and they belong to what Deleuze in his work on the temporal configurations in the cinematic experience articulates as “time-images” (Deleuze 1989, 130). According to Deleuze, the time-image constitutes a new mode of narration in cinema different from the traditional “movement-image,” which is driven by motion in chronological progression: “We no longer have an indirect image of time which derives from movement, but a direct time-image from which movement derives”

(Deleuze 1989, 129). Rather than representing time in a continuous order through sensory-motor links (e.g. flashbacks and montage-cuts), the time-image reveals time as multiple, discontinuous, and disorderly as it perpetually splits into an *actual* present and its *virtual* double in memory.⁶ This split into an actual present and a virtual past is perception's way of 'seeing' more than the present. This occurs through an affective weaving together of the sensory data in the present and of memories of the past in the formation of an immediate future (e.g. having walked into a room, I am confident another room will appear if I open the door again, although I cannot actually see the adjacent room).

I regard the archive and the anarchive as closely related to this forking of time, since the actual is that which can be archived whereas the virtual is memory's anarchival potential to grasp beyond the archive's historical narratives—to contest, to overflow, and to mutate history as truth so that the future may become different. The anarchive is the virtual excess of memory traces that linger on despite the archive's often violent selection of what is deemed worthy for future recollection. It opens up lines of flight from the authoritative narrative ordered by the archive. As previously argued, however, the once stable foundations upon which history was built and which collective memory would be accessible are replaced with the meta-stability of regenerative real-time technology, thereby invoking short-term memory and an amplification of anarchival de(con)struction of truth.

While Deleuze had trouble coming up with examples of peaks of present in cinema, the term works well to illustrate how sense-making today is closely interwoven with the multiple temporalities that traverse and co-constitute digital networks. Because this chapter focuses on peaks of the present, it does not further unfold the other time-image, sheets of past, in which memory is traversed in a falsifying search for a truth in multiple "not-necessarily true pasts" (Deleuze 1989, 131). In peaks of present, the newness of an event does not arise from a return to virtually preserved pasts—as is the case in the time-image sheets of past—but from variations of an event's actualization in separate, simultaneous timelines, each of which constitutes a reality relative to the others:

However, this new mode of narration still remains human, even though it constitutes a lofty form of non-sense. It does not yet tell us the essential point. The essential point rather appears if we think of an earthly event which is assumed to be transmitted to different planets, one of which would receive

it at the same time (at the speed of light), but the second more quickly, and the third less quickly, hence before it happened and after. The latter would not yet have received it, the second would already have received it, the first would be receiving it, in three simultaneous presents bound into the same universe. This would be a sidereal time, a system of relativity [...] where there are not only different worlds [...] but where one and the same event is played out in these different worlds, in incompatible versions (Deleuze 1989, 102).

These simultaneous presents are bound together through the occurrence of the same event, and yet they remain distinct from each other, thus constituting “a system of relativity” where the simultaneous actualisation of each “sidereal time,” each present, is not impossible but “impossible” together (Deleuze 1989, 130). Deleuze builds on the notion of “compossibility” from Leibniz, with which Leibniz argues for the existence of a plurality of worlds composed by individuals (whether things or people) that may be contradictory to one another but are nonetheless “compossible” together (Deleuze 1989, 130). Deleuze furthers this view in his argument that the same event occurs in simultaneous presents that are not compossible together as part of the same world, since this would negate their autonomous actualization, but they are relatively bound in the same universe and thus ‘impossible’ together.

While contemporary regenerative real-time networks were not yet developed when Deleuze wrote his philosophic books on cinema, his term *peaks of present* as an image of the sensation of time is highly relevant if we are to understand and further explore Ernst’s argument that “the present becomes radically temporalized” through real-time data processing (Ernst 2018, 172). What happens to our ways of making sense of the worlds we inhabit when memory, as the virtual reserve of an event’s actualization, “has become a function of immediate access to data storage centers” (Ernst 2018, 172)?

TORRENTS OF MEANING

Today, sense is made in conjunction with the real-time distribution of images that are formed and transformed in the local and global realities in which they circulate. Images of a world cup victory, a political scandal, or an environmental catastrophe are transmitted to a global audience and responded to in real-time. People from different cultures and in different social contexts all relate and respond to images of the same events as they occur or in their aftermath. These images are transmitted through a vari-

ety of channels, where personal devices supplement the production and transmission of images in traditional news media such as newspapers and television. Live video streaming via Facebook or Periscope, Twitter texts and instant messaging apps, and Snapchat photographs constitute some of the applications and platforms through which individuals produce and distribute multimodal images of events occurring far away – globally felt as familiar and near or just around the corner, yet strangely felt as distant and peripheral. Circulating among these abundant streams of videos, texts, sounds, and photographs are modified imagery and fake news. Whether they are forgeries or actually communicate real situations, a common trait of these rapid streams of images circulating the Internet is that they all claim to be true, and in the anarchival paradigm of real-time processing and short-term memory, they all become true—in the sense of real, online information.

The non-commercial institutions that had more or less exclusive rights to write and maintain history in print culture (libraries, archives, museums) are under pressure from corporations with commercial interests in engaging a broad public in the production, consumption, and sharing of cultural and social content (e.g. Facebook, Google, Apple, Amazon). Collective memory is thus no longer filtered and accessed through centralized institutions at a national level, but through distributed channels on a global scale. It is through these real-time networks, informed by policies and values from a globalized context, that we as individuals make sense of the different worlds we are connected to and inhabit.

Increasingly, the individual is thus under pressure (from time and peers) to make sense of the torrents of meaning that can be attributed to information on the WWW. The accelerated response time entails that habits of affect reaction are more likely to dominate how information is received and produced in the continuous engagement with real-time news, for example. In a way, the body has been transformed from what we might call an event-container, where memory creatively intervenes into sense-making procedures, into an *interface* through which signaletic flows are modulated and relayed according to automatic, or habitual, responses.

The body as interface emphasizes how the experiential process of filtering and processing sensory input has been accelerated and to some degree automatized by real-time interfaces. Moreover, real-time technology seems to push and extend the feeling of presence to such a degree that we feel like everything is happening right now, and it would be a shame to

miss out. So many channels of information scream for our attention in a sort of ‘actuality overload’ which might cause a general ‘fear of missing out’ (FOMO) on what might prove enriching events (social gatherings, cultural and political activities, job opportunities, etc.). What could potentially go down in history as ‘the best pool party ever’ or ‘a turning point for the climate crisis’ hold promises of being included into the social and collective memories of groups and societies in a constant search and push for events to come. This striving to take part in, to consume, social and cultural memory as it happens—or even premediated (Grusin 2010)—is followed by a drive to produce and publish imagery that documents one’s own presence in the situation, thus inscribing oneself into its immediate history.

MORE THAN REAL-TIME

Through *Listening Post*, we take a step back from the streams of actualities that perpetually overflow our news feeds and inboxes. In doing so, we may gain access to the peaks of present—as an anarchive of sorts—that permeate digital networks. Resembling a large-scale version of monitoring stations from which security guards or data analytics observe offline and online movements of the masses, *Listening Post* does not call for active participation but rather encourages people to wait and allow for something to happen in its own time. Unlike data analytics, however, the decoding of data does not occur through a reductive model of truth, but in a falsifying manner where nonsensuous linkages across data create a fabulatory allure. When a text like “I am at a train station” appears on one of the small screens, memory traces of train stations might appear and flicker away, and you might begin to wonder and to construct a world around this deterritorialized fragment of information. Where is the train station? Why do we need to know? Where are you going—and why?

The point of interest, however—in *Listening Post*, as well as in *The Pirate Cinema*, is not the reception of each individual image. It is rather the way streams of images are dynamically organized to constitute what Deleuze calls *signaletic material*, “which includes all kinds of modulation features, sensory (visual and sound), kinetic, intensive, affective, rhythmic, tonal, and even verbal (oral and written)” (Deleuze 1989, 29). The signaletic material encompasses that which is in excess of representation’s narrative function—what has traditionally been treated as ‘noise’—and it thus underscores and modulates the potential for communication to

arrive. In relation to real-time interfaces, Bodil Marie Stavning Thomsen argues that the signaletic material presents “a becoming of time itself” (Thomsen 2012, 3), which differs from the encapsulation of time in older media. Building on this, Anna Munster argues, “For time to become—that is, for it to become potential tendencies other than *real time*—intensities and different durations also need (their) time” (Munster 2019, 232). For real-time to be perceived as live and contemporaneous with the recorded situation, any ‘dead time’—i.e. discontinuities and delays in data transmissions—should be minimized and rendered imperceptible. Any reason to doubt, to question, and to oppose the signal’s authentic origins is effectively ruled out in the smoothing out of real-time data transmissions.

To give intensities and durations (their) time is to reclaim the time of the *event* in which fabulation may flourish in dynamic assemblages of the imaginary and the real. Death, forgetting, and the anarchic is paramount to revitalizing event potential beyond the ‘actuality overload’ of too-real-time. This is because the event, “is always a dead time; it is there where nothing takes place, an infinite awaiting that is already infinitely past, awaiting and reserve” (Deleuze & Guattari 1994, 158). Encountering the interfaces of *The Pirate Cinema* or *Listening Post* you are encouraged to wait. You are encouraged to wait for the event to take you through an intensive experience of time’s becoming, to wait for memory’s virtual reserve of past presents to superimpose itself on the signaletic material’s nonsensical data. Sensory registration of the signaletic material’s plastic dynamics are thus shot through with affect’s nonsensuous coupling of data, which enables a fabulatory generation of more than real-time informational compositions. *Listening Post* and *The Pirate Cinema* thereby facilitate new modes of experiencing real-time network transmissions, sidestepping the accelerated sense-making procedures in contemporary human-computer interactions. Patterns form and transform across data that have been extracted from their archival roots (from online forums and file-sharing networks). This anarchival procedure reconfigures the potential for data to be perceived virtually, so to speak, in sensing time as a becoming—as peaks of present—rather than in terms of an organizational order in archival space (e.g. understanding a discussion in a chat room by reading posts in their chronological order).

Far from revealing ‘the essential point,’ *Listening Post* and *The Pirate Cinema* compose time-images that allow for the networked simultaneity of actualized presents to be virtually ‘seen’ in their temporal becoming

and reflected upon through nonsensuous linkages in perception. Instead of reducing the realities from which the conversations are pulled to statistical measures, *Listening Post* invites the audience to complicate their actuality by fabulating on their relative existence in a network of simultaneous presents. Similarly, *The Pirate Cinema* scaffolds a kind of nonsensical ‘network narrative’ where the perception of simultaneous flows of real-time data transmissions causes an abundance of patterns and similarities to emerge from the signaletic material. Such real-time circulation of nonsense data produces a sensation—intense and excessive—of the way information is assembled, modulated, and distributed in digital networks.

This chapter has proposed to understand the prevalence of real-time networked technologies in terms of an anarchival amplification, and I have shown how the new means of transmission may be operationalized to facilitate a ‘power of the false.’ I have argued that real-time processing has its risks and opportunities in terms of modulating how social memory is produced and distributed, and thus how people individuate as groups and as individuals. Through analyses of *The Pirate Cinema* and *Listening Post*, I have shown how real-time processing does not necessarily lead to pre-emptive modes of experience, but can reconfigure and revitalize virtual time. I thereby argue that the continuous development and deployment of modulating real-time networks hold the possibility of an excessive production of affects and values that resist, slip through and bounce off capitalistic capture. By accentuating the anarchival potential in digitally mediated sense-making procedures, I argue that what matters is not the technology itself, but the strategy through which the technology is developed and set in motion. I have proposed the Deleuzian ‘power of the false’ as one such strategy as a movement away from memory becoming “a function of immediate access to data storage centers” (Ernst 2018, 172) and towards leveraging memory’s capacity to fabulate—to produce affect and make sense from nonsense. An anarchival approach to the design and operationalization of technology may thus be a way of working affirmatively with the excess of memory, affects, and sensations produced in affective interface events.

NOTES

1. The chapter is part of a broader PhD project, where I work with the notion of the anarchive as a potential resource for interaction design.
2. For a more elaborate analysis of *The Pirate Cinema* in terms of its technical and temporal aspects, see Cox 2015.
3. The BitTorrent protocol allows for a file to be simultaneously uploaded/downloaded among an infinite number of 'peers,' rather than the file emanating from a single source. The protocol divides the file into smaller pieces, and whenever a piece has been downloaded by a peer, it becomes a source for others to download; when a recipient has downloaded all pieces of a puzzle, the protocol reassembles the file. This distributed sharing in a network of peers is an efficient way of reducing bandwidth load.
4. While Parikka (2015) has problematised the ecologies of planned or accidental obsolescence of media technologies (from production to electronic waste) that follows from this rapid development and replacement of hard- and software, Chun (2016) argues that new media technologies are not actually working to make a difference in terms of the long-awaited democratic empowerment, but are habituating our ways of relating to the world by "updating to remain the same" (#).
5. For a deeper inquiry into the mortality of digital data in real-time information networks, see Mackenzie (1997).
6. In his work on memory and time, Deleuze draws on Henri Bergson's notion of 'duration' (*durée*) in order to distinguish chronological time from felt time, 'chronos' from 'aion.'

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