32 Latency

Kristin Veel

Etymologically, *latent* refers to something concealed or secret. It comes from the Latin *latentem* (nominative *latens*), the present participle of *latere*, meaning "to lie hidden, lurk, be concealed," which is also related to the Greek *lethe* ("forgetfulness, oblivion") and *lethargos* ("forgetful"). In the seventeenth century, it came to connote something "dormant, undeveloped," in the medical sense of a disease that is present but not yet producing symptoms or clinical signs. The notion of *latency* is thus situated in the twilight zones between visibility and invisibility, knowing and unknowing, gesturing toward something hidden from view that we expect to emerge into visibility at some point in the future. Besides prompting fundamental ontological, epistemological, and hermeneutic questions about the properties of that which is latent and how we may come to know it as such, it prompts spatial considerations (where is something hidden?) and temporal stretches of anticipation (when will it show itself?). These spatiotemporal connotations of a fluctuating field between the visible and the invisible are pertinent when we try to grasp the properties of the *uncertainties* that abound in big data archives, making latency, with its cross-disciplinary connotations, a particularly apt entry point for consideration of a field that by its very nature requires interdisciplinary methodologies.[1]

The Temporality of Uncertainty

As we enter the twentieth century, the connotations that etymologically link the word *latency* to the uncertain gradually move from the realm of the unknown (as in secret) toward something one tries to understand and master, which can to some degree be measured. In medicine "a latent period" designates the delay between stimulus and response, not just in the waiting time before a disease manifests but also in the period before the effect of an administered drug becomes apparent. This marks a different relation to uncertainty in which we are not merely at latency's mercy—forced to wait until what is hidden reveals itself—but

are also in a position of control because we have the means to measure the delay and understand its mechanisms.[2] In physics and engineering, latency as time delay is explained by the velocity and speed at which things with spatial dimensions can interact. According to the laws of physics, such physical changes are always less than or equal to the speed of light, and this creates a delay in response. In the computational use of the word, *latency time* is what limits the maximum rate at which information can be transmitted, and the minimization of latency time remains a key challenge in communication engineering. Here the uncertainty is no longer a condition we accept or merely try to understand but one that we actively engage with and try to manipulate. An example is the waiting time involved in live transmissions, when the signal travels a certain geographic distance through a chain of communication equipment (satellites or fiber-optic cables). The parameters that can influence latency time, and which engineers seek to minimize, include the delay incurred by the medium (wired or wireless), the size of the packet, the gateway nodes (such as routers) that examine and possibly make changes in what is sent, and (in the case of Internet latency) the server's occupation with other transmission requests. Tuning the computer hardware, software, and mechanical systems is a technique to reduce latency. Latency can also be camouflaged through prefetching, in which a processor anticipates the need for data input and requests the data block in advance so that it can be placed in a cache and accessed more quickly. In some of the applications based on blockchain technology (for example, cryptocurrencies), an emergence of what might be called a *latency economy* can be seen, insofar as the users are able to pay to have their transaction placed in a more advantageous position in the distributed ledger and thereby minimize the latency between when the transaction is made and when it is registered in the ledger. Here the temporality of uncertainty is not only something over which mastery is sought; it has become a commodity in itself.

The term *latency* thus today carries a rich and diverse set of connotations spanning a wide range of disciplines, most embedded in temporal trajectories and overlays in which the presence of that which is latent conflates the past, present, and future in intricate constellations. The temporal connotations of the invisible that latency carries make it a potent term for addressing the uncertainties of big data archives, which are not only repositories of the past but also vehicles for predicting and preempting the future.

The Stowaway

Latency's temporal conflation is also foregrounded in the application of the term in aesthetic and cultural theory, where it has received considerable interest in recent years (Bowker 2014; Gumbrecht and Klinger 2011). Cultural theorist Hans Ulrich Gumbrecht (2013), for instance, uses the term *latency* to argue that the twentieth-century conception of time has

transformed, from a linear directionality aiming toward change and progress to a condition of simultaneity that he calls the broad present, in which it has become impossible for us to leave the past behind. In making this argument, Gumbrecht references Dutch historian Eelco Runia's concept of presence as linked to the figure of the stowaway, which foregrounds the spatial dimensions of a sense of latency and gestures toward the difficulty of grasping that which is not (yet) there: "In a situation of latency, when a stowaway is present, we sense that something (or somebody) is there that we cannot grasp or touch—and that this 'something' (or somebody) has a material articulation, which means that it (or he, or she) occupies space. We are unable to say where, exactly, our certainty of the presence comes from, nor do we know where, precisely, what is latent is located now" (Gumbrecht 2013, 22). Not only does the figure of the stowaway invite us to consider in more detail the spatial connotations of latency (what are the properties of this space where someone or something lies dormant?), but the anthropomorphic connotations inherent in the figure of the stowaway also allow us to think more closely about uncertainties as carriers of agency and intent. What kind of "consciousness" or "cognition" can we ascribe to this stowaway if we conceive of it as an uncertainty embedded in a big data archive?

We may expand on this analogy by turning to Sigmund Freud ([1905] 1999), who speaks of the *latency period* (after the oral, anal, and phallic stages and before the genital stage of puberty, when the child develops sexual interests in people outside the immediate family). It is a period when the sexual drive lies dormant, and desires of the earlier stages are repressed or sublimated. It thus forms a small lacuna between more libidinal phases, bridging the desires of early childhood and anticipating the development of adult sexuality in puberty, but it also holds the potential for breeding neuroses, Freud argues.[3] Metaphorically, we may see uncertainties in big data archives as situated in similar lacunas, where their properties as skewed biases or ethical dilemmas have not yet taken form as fully fledged neuroses. As long as they are indeterminately categorized as "uncertainties," without specific properties that would call them out of their latency and require them to take tangible form with specific consequences, their libidinal drive (intent or agency) is likewise difficult to determine.

Determining Uncertainties

The latent uncertainties in big data archives encompass the unknowns or unknowables that we are blind to and therefore do not think to harvest. They also encompass the inherent biases or social sorting mechanisms that reveal themselves when the archives are put to use, rendering users as well as the system itself vulnerable. As is often emphasized, a quantitative approach and a focus on the aggregation of vast amounts of data means a larger tolerance for flaws in individual pieces of data, based on the assumption that these flaws will even out

as long as the collected data material is big enough (Cukier and Mayer-Schönberger 2014). Nonetheless, what the types of latent uncertainties mentioned here (which, although they are not necessarily perceptible to human cognition until they reach critical mass, can have severe real-world implications) have in common is that they are difficult to address. How do we call them into visibility and understand their mechanisms without thereby altering them?

This notion of uncertainty is in accordance with that asserted by quantum physicist Niels Bohr. In contrast with Werner Heisenberg's uncertainty principle, Bohr did not understand uncertainty as arising from the experimenter's interference but rather asserted that *position* and *momentum* do not have determinative values *until* they are measured (Barad 2007). Latencies occupy the space before measurement. They may, however, be further understood as operating in the realm of what literary scholar N. Katherine Hayles, in her bridging of neuroscience, cognitive biology, computer science, and literary studies, calls *nonconscious cognition*. This term describes the level below modes of awareness (where the psychoanalytical notion of the unconscious is located[4]) and applies to human, animal, and technical cognition alike. Hayles (2017, 28) writes: "Removed from the confabulations of conscious narration, nonconscious cognition is closer to what is actually happening in the body and the outside world; in this sense, it is more in touch with reality than is consciousness." Hayles's approach allows us to see latent uncertainties being played out in a realm below conscious awareness and in correspondence with ongoing natural, technical, and bodily processes that take place in the world, often without our conscious recognition of them. Understanding the uncertainties of big data archives as latencies that operate on the level of nonconscious cognition, where they do not yet have determinative values, may offer an entry point for better understanding the indeterminate spatial and temporal properties of those uncertainties (their position and momentum, if you like), as well as ultimately acknowledging the existence of those uncertainties at a stage before we are able to consciously engage with them. Reconceptualizing them as nonconscious cognitive latencies, we may think of the cognition of uncertainties in big data archives without recourse to the anthropomorphic figure of a stowaway with a consciousness while retaining the questions of intent and agency.

However, it is important to avoid the fallacy of regarding uncertainties as somehow "intrinsic" or "innate" in the big data archives where they occur, which would remove human responsibility for identifying their causes and consequences. Latency (with the particular spatial and temporal connotations that the word carries) may help us to avoid dismissing uncertainties by black boxing them while retaining their ontological indeterminability. It may thus leave us better equipped to address the hermeneutical conundrum, so pertinent to big data archives, of the agency and intent of the uncertain.

Archives, Agency, and Intent

Media theorist Wolfgang Ernst draws a distinction between data and narrative: "In the archive, nothing and nobody 'speaks' to us—neither the dead nor anything else. The archive is a storage agency in spatial architecture. Let us not confuse public discourse (which turns data into narratives) with the silence of discrete archival files. There is no necessary coherent connection between archival data and documents, but rather gaps in between: holes and silence" (Ernst 2004, 3).

Nonetheless, huge efforts are currently being made to "make data speak," often through machine learning and artificial intelligence (AI) technologies and propelled by the argument that there is an intrinsic knowledge "hidden" in the data that can be teased out with the right technology. This can, for instance, be found in the marketing rhetoric of companies promoting data visualization or "natural language generation" with slogans such as "tell the stories hidden in your data."[5]

Literature and digital humanities scholar Franco Moretti takes Ernst's argument further, claiming with regard to the mass digitization of archives that "one cannot study a large archive in the same way one studies a text: texts are designed to 'speak' to us, and so, provided we know how to listen, they always end up telling us something; but archives are not messages that were meant to address us, and so they say absolutely nothing until one asks the right question" (Moretti 2013, 165). Both Moretti and Ernst point to the difference between an archive of data and a text with narrative intent, emphasizing the importance of the questions asked of data rather than transferring intent onto the data itself. In other words, intent is incurred in the interaction with the archive, not necessarily present in the individual data as such. It is in that moment of calling the latent into visibility—of determining position and momentum—that intent, and hence also potential bias, reveals itself. In the act of turning the latent into something more manifest, the uncertainties take concrete and specific form.

However, what the notion of latency emphasizes is the intricate temporality of this act that conflates past, present, and future. As latently present, the uncertainties are already there in the archive before any questions are asked, embedded in the structures that make up the archive and in the decisions about what to include and what not to include. Indeed, they may even solicit particular questions. We thus need to acknowledge the fallacy identified by Ernst and Moretti that data "speaks" to us while keeping in mind that intent emerges in the complex assemblages of conscious and nonconscious cognition of the humans and technologies that brought this data into being. Addressing big data archives as latencies allows us to recognize that uncertainties and their properties are dependent on the questions we ask of data, as well as to acknowledge that with AI and machine learning this calling into

visibility is a human as well as a technological process that takes place just as much when it is programmed as when the data is being interpreted.

By regarding our engagement with big data archives in this way—as an interaction with a spectrum of nonconscious cognitive latencies stemming from humans and technologies alike—we can begin to think critically about the meaning-making processes that big data archives simultaneously stimulate and reflect.

Notes

1. This chapter draws on Veel (2016, 2017a, 2017b, 2018), as well as my book with Henriette Steiner (Steiner and Veel 2020).

2. Marika Cifor's engagement with *undetectability* as "the status of a person living with HIV who, enabled by pharmaceutical treatment under medical supervision, has lowered the load of the HIV virus in their body to levels that are insignificant statistically and that render it non-contagious" (Cifor, forthcoming) speaks to a condition of controlled latency. So does the use of latency to describe the halt of the development of biological cells in cryobiology (Radin 2013).

3. For instance, in "An Autobiographical Study": "Of all living creatures man alone seems to show this double onset of sexual growth, and it may perhaps be the biological determinant of his predisposition to neuroses" (Freud [1925] 1946, 66). See also his wider conceptualization in "Moses and Monotheism" (Freud [1938] 1939).

4. Freud ([1933] 1999, 70) describes latency as a form of the unconscious that he terms "the preconscious," which can more easily become conscious again than the unconscious proper.

5. For instance, Narrative Science, Narrativa, and Automated Insights, Inc.

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