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ARTICLE

Sailing on Encrypted Seas: The Archive and Digital Memory in African and Diasporic Futurism

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Digitization has commonly been marketed as a predictive technology that can enable humanity to intercede into the future. This faith in digital media's prophetic powers, however, obfuscates the fact that digitization is unavoidably stuck in the past. In effect, digitization transforms the past into highly mutable and volatile data sets that are persistently rewritten by computer's memory refresh circuits. While some lament this temporal incongruity as problematic to the archival process, African and diasporic futurist artists are utilizing digital distortion as an opportunity to emplace the archival process within the sea and reimagine the archive as an impermanent, transitory, and fluid practice that has the capacity to usher in a more culturally and scientifically nuanced understanding of memory. This article explores the capacity of the sea to reorientate digital humanities scholarship around the cyclical interplay between machinic, environmental, and human social systems and craft historiographical methods around envisioning a viable future for humanity.

Introduction

In Nnedi Okorafor's debut novel *Lagoon*, digital media crash lands into Earth where it quickly finds its alien home in a murky lagoon off the coast of Lagos, Nigeria. Okorafor's literary metaphor might seem odd when considering that digital media runs on electricity, yet the metaphor of sea vividly captures digital media's watery futures (Okorafor). Submerging scholars in an unfamiliar, alien world where the materiality of texts and objects are fundamentally transformed into ephemeral moments in time that are routinely pulled back by the tide and mixed with new itemsets and clusters to be reborn as fragile new hybridities, digital media does not store the past. Rather, it fundamentally transforms the past into what can only be described as terrifying monsters that slither back beneath the interface's murky waters as quickly as they surface on our screens.

Okorafor's metaphor of sea exemplifies a growing scholarly and artistic movement within digital humanities to relocate digital media's origins from the US military's static and uncompromising command structure to the strange and otherworldly undercurrents of humanity's watery futures. In particular, digital futurist artists Geraldo Oliveira, Alex Chivir-Ter Tsegba, and Jean-Pierre Marchant demonstrate how scholarship can approach digital

media's volatility as an opportunity to immerse archival material into a contested sea of memory where humanity can regenerate otherworldly visions of humanity's futures. Reimagining the story of digitization from the perspective of the sea offers a renewed narrative framework for digital humanities scholarship that effectively grapples with digitization's inherent volatility while simultaneously drawing attention to digital media's complex and dynamic relationship to the environment.

Regenerating the Archive

On September 23, 1949, US President Truman's announcement of an atomic explosion in the Soviet Union shocked Americans. Until the invention of atomic weapons, Americans tended to have an unrelenting faith in the ability of the Pacific and Atlantic Oceans to protect them from military threats. Growing fear over the potential for Soviet nuclear weapons to fly undetected across the Bering Strait quickly shattered Americans' faith in the sea's cloak of military invisibility.

To thwart this watery threat, the military launched the United State's first air defense system, the Semi-Automatic Ground Environment, or SAGE. The idea was fairly simple in that it consisted of a large and expansive network of radar that detected incoming missiles flying across the Bering Strait and transmitted that information back to a centralized direction center. SAGE transformed the United States into what Paul Edwards has described as an "air-defense bubble" (Edwards 104).

Central to the project's completion was the development of a fundamental concept in computing, memory. Rather than use storage tubes, SAGE used hard magnetic material as transformer cores to store bits of information. Electric current pulses sent in some of the wires through a core allowing the direction of the magnetization in that core to be set in either direction, thus storing a one or a zero.

Magnetic core-memory was a watershed development in the history of computing, since it dramatically improved the efficiency and speed in which data could be stored and would become the first step toward RAM memory. Prior to the development, the storage process was unreliable and subject to variation. Magnetic core-memory seemed to provide no limitations in its capacity, eliminating the problem of state decay and the consequent need for refreshing (Edwards 102). In fact, they were able to hold their states even after the computer was powered off.

Although SAGE dramatically improved the efficiency of computation, the system was quickly usurped by a far more powerful alternative. The invention of the transistor-based semiconductor memory and the integrated silicon RAM chips of today's computers were faster, smaller, lighter, and more economical than their magnetic precursors. A memory refresh circuit periodically rewrites the data and restores the capacitors to their original

charge to offset the leaks on the capacitors attached to the electrical charge. In effect, semiconductor memory sacrifices the permanence, stability, and reliability of the US military's magnetic core memory for speed and efficiency.

The decision to sacrifice stability and reliability for speed was one that foreshadowed digital computation's watery futures. First introduced by John Vincent Atanasoff, the idea of regenerative memory was initially used to describe the processes by which non-static devices could hold their values because their signals degenerated overtime, such as Williams tubes, the predecessor to the magnetic core (Mackintosh 90–92). Atanasoff did not initially use the phrase "regenerative memory" to describe this process. Instead, he used the concept of "jogging one's memory" to describe the way in which the charge needed to be restored in a capacitor so that it would not decay to 0 or negative (92). Atanasoff thus imagined the capacitor as functioning in much the same way as the biological processes inherent in nature.

Semiconductor memory's apt similarities to human memory's inherently volatility are crucially important, since they reveal digital media's inherent volatility and unpredictability. Semiconductor memory supplanted the US military's promise of stability with a volatility that fundamentally dismantled the military's assurances of magnetic core memory's impenetrable safeguards. What emerged from the watery threats across the Bering Strait was neither static nor safe but a highly mutable and volatile instrument that remained impervious to human control.

Rather than issue warnings about semiconductor memory's inherent volatility, digital technology companies instead marketed digitization as a stable and reliable tool that could save physical materials threatened by material decay. By the early 2000s, Google was rapidly becoming an early evangelizer of digitization's seemingly limitless storage capacity and played a formative role in shaping early expectations and assumptions about digital media's capabilities. Google's evangelization efforts tended to converge around what many believed to be the ultimate source of material decay in society: the archive.

In 2004, Google promoted an ambitious program that aimed to save the archive from material decay, called the Partner Program, but announced publicly as "Google Books." The program involved a collaboration with publishers whereby Google actively worked to persuade publishers to scan their books and deposit their scanned texts into their centralized digital database. Google promoted the program as free marketing and advertising, since it would allow users to sample a portion of the book (Thompson).

Unbeknownst to publishers at the time, Google was also working on a more covert project called "The Library Project" that attempted to digitize university archives. The University of Michigan was among the first

universities to agree to digitize its entire collection of more than seven million books. Stanford soon followed behind Michigan and agreed to initially digitize two million books with the stated aim to soon expand the program. Each library received a digital copy of the scanned book deposited into Google's database in return for their participation in the program. Google, conversely retained the scanned copy in its search index (Harpur 135–37).

While Google stressed that the program was intended for research and preservation of the globe's most valuable resources and ensured the longevity of existing archives, some publishers contested the project as an infringement of copyright. The debate eventually progressed into a lawsuit between Google and the Author's Guild and the Association of American Publishers (AAP).

In 2011, the US District Court for the Southern District of New York rejected the proposed settlement between the AAP and Google, arguing that Google's process of digitization was inherently "transformative." The Judge found that "Google's use of copyright works is highly transformative" in that "Google digitizes books and transforms expressive text into a comprehensive word index that helps readers, scholars, researchers, and others find books" (Healey). Furthermore, the Judge claimed "Google Books has transformed book text into data for purposes of substantive research including data mining and text mining in new areas."

From the perspective of the US District Court, Google was not merely storing nor extending the lifespan and accessibility of text-based archives, but they were creating something entirely new. The Court's astute recognition of digital media's unique capacity to transform text-based media exposes a central problem at the heart of digitization. The computer does not merely 'store' texts or images, but it refreshes the past through a volatile process of degeneration and regeneration.

Describing this central distinction, media theorist Wolfgang Ernst argues that digitization fundamentally shifts the priority of traditional archives from storage to transmission and access (Ernst 194). In the past, traditional archives used metonymic linguistic ordering to categorize information into discrete names, dates, and categories. These discrete categories in turn allowed historians to construct links between the materials in an attempt to create unified and cohesive narrative representations of the past. By contrast, computation reframes and reorganizes uploaded materials into itemsets and association rules, clusters and clusterings, and decision trees that ultimately aim to find similarities and patterns between certain identifying characteristics.

In the case of images, Wolfgang Ernst explains that digitization is not interested in establishing authorship. Rather the expressed goal is to establish an objective means of describing and identifying pictorial similarities, including color, motif, form, etc. As Ernst describes, "Since the comparison

of images here is of a simple overlay kind, and points of similarity and difference are recorded during the process of comparison, the central criterion is a simple matching process - a visual equivalent of the well known word search that is a standard feature of every word-processing and database computer software" (118).

In effect, when an image is uploaded into a digital database, it is transformed into a set of quantifiable elements that fundamentally change and distort the image to fit within its frames of reference. Moreover, digital media cannot 'store' these materials, but it can only temporarily suspend its refresh cycle to display the uploaded sounds and images on screen temporarily. It is for this reason that Ernst describes digitization as "time-based media," since digitization fossilizes time or transforms time into a series of discrete sounds and images that can only be momentarily suspended on screen.

Building upon Ernst's insights, media theorist Wendy Chun warns that digitization "transforms processes in time into texts and discrete artifacts in space" (Chun, *Programmed* 19). The key behind this transformative process is source code. As Chun explains, "Source code as technê, as a generalized writing, is spectral. It is neither dead repetition nor living speech; nor is it a machine that erases the difference between the two. It, rather, puts in place a relation between life and death, between present and representation, between two apparatuses" (25). Source code effectively transforms alphanumeric text into a set of moving images and sounds that make it appear as though source code's alphanumeric text has come to life before the user.

Although source code might be written in the past, it is projected out at the user as present action. Chun describes this effect as a form of "sourcery," since it conceals from the user the very obvious fact that source code is not the singular power that animates their screen. According to Chun, "The information traveling through computers is not 1s and 0s, beneath binary digits and logic lies a messy, noisy world of signals and interference" (139). The interface conceals the messy interpretive process from the human user who is tricked into believing that source code is an animating force. Without the ability to see the messy interpretive process behind the black screen, the user is left with a powerful illusion.

Digitization then is not just time-based media, but it is time-based media that fundamentally disrupts our perceptions of time. In contrast to the traditional archive, digitization inverts time, reframing the past as an enduring present. The clear distinction between our 'stored' past and the elusive present is blurred before the user who only sees and hears what appears as 'living' animated sounds and images. Ernst calls this effect "archival phantasms," since digital databases neither extend nor remap the archive. Rather, they are an "ideological deflection of the sudden erasure of archives (both hard-and soft-ware) in the digital world" (Ernst 119).

This erasure, in turn, induces a certain forgetfulness or uncertainty, since digital media will not always regenerate everything that it persistently erases. Computation's growing ability to amass more data is marketed as increasing certainty, yet it does the exact reverse and induces a false sense of security (Thylstrup et al. 1–5). Even the Internet Wayback Machine or web.archive.org which is commonly called the "library of the Internet," cannot store or preserve webpages but only regenerates links on webpages, many of which are broken, since webpages can only link to images and those link locations are always changing. The IVM is a zombie graveyard in that the pages being 'backed up' are merely empty corpses of what once was, neither dead nor alive, linking to addresses that no longer exist.

Submerging the traditional archive within a murky lagoon of persistently changing currents, digitization poses a significant challenge to historians. If the task of the historian is to preserve and tell the stories of the past, digital media's teams of bots, servers, electrical currents present a central obstacle. In effect, digitization's inability to store materials means that it cannot point to the future. For example, you put an object into storage, because you anticipate that you will need it in the future. Whereas storage is primarily focused on the future, memory, by contrast, points back to the past and requires repetition, due to its transient nature. As Chun aptly describes, "Memory contains within it the act of repetition: it is an act of commemoration—a process of recollecting or remembering" (133).

While digital media might be commonly marketed as immutable storage, it is in fact as mutable as human memory. Yet, the power of sourcery obscures this from the human user who believes that source code has the ability to manifest visions of the future on screen. The common marketing of digital media as ushering in the future obscures and mystifies the fact that digital technologies only function by redirecting humanity back to the past. A tweet, for example, is already the past once tweeted. Twitter might organize this past into "trends" in an effort to reframe them as pointing toward some imagined future, but those trends in fact point back to a certain past. Digital media, as Chun notes, merely 'updates to remain the same' and thus cannot offer anything new but persistently attempt to reframe the past in different ways to present the illusion of newness (Chun, *Updating* 3).

Digital technologies might be sold as storage, but they are simultaneously and paradoxically pointed to the past. This paradoxical tension is nowhere more apparent than with the growing threat of bugs. Because source code functions around the ability of programmers to predict how computers will interpret their instructions in an imagined future, bugs or unexpected circumstances remain a persistent problem for computation. Computers routinely interpret instructions in ways in which programmers cannot foresee or predict. Bugs thus reveal the fundamental inability on the part of human programmers to control computation.

Computer scientist Joseph Weizenbaum describes the problem that bugs pose to computation as animating from two opposing and irreconcilable facts which a programmer must reconcile with: "First, he knows that he can make the computer do anything he wants it to do; and second, the computer constantly displays undeniable evidence of his failures to him. It reproaches him. There is no escaping this bind. The engineer can resign himself to the truth that there are some things he doesn't know. But the programmer moves in a world entirely of his own making. The computer challenges his power, not his knowledge" (Weizenbaum 115).

Building upon Weizenbaum's insight, bugs frustrate digitization's conflation of storage with memory, exposing the inherent transience, fragility, and unreliability behind digitization. Whereas the task of the historian was once to stitch together archival documents that sat passively and safely on storage shelves, bugs reveal how those archival documents are not only alive but incredibly volatile. It is as though digitization has submerged the archive within an alien world where the once passive and safe archival documents have been transformed by digitization's sourcery into temperamental sea creatures.

This alien world, however, is not entirely unfamiliar to historians. In much the same way as digital media had a tendency to conflate storage and memory, the invention of photography fundamentally transformed the assumed distinction between storage and memory. Exploring photography's influence on human understandings of time, religion scholar Molly McGarry describes the processes by which photography's presents seemingly irrefutable and immutable representations of the past (McGarry). Like digital media before it, the photograph was assumed to be transparent, immune to human manipulation, since it was assumed to be under the exclusive purview of an objective machine. The camera was intended to outlast and outperform the body's inherent mutability and fragility, offering humans the possibility of release from their vulnerability to time's unrelenting degeneration.

Although photography might have been represented as immutable, photography was in fact an act of sorcery. In effect, photography created a temporal inversion of sorts whereby the screen of the camera transformed time itself into tangible visions that were in turn projected back out at the viewer as if they were visions of their future. Through the manipulation of light, the camera created a haunting mimesis of the past that could stretch indefinitely into the future. Looking at a photograph of a civil war battlefield, for example, continues to transform contemporary Americans' attitudes about war. It brings the civil war into the future with vivid detail and seemingly irrefutable historical accuracy.

In much the same way as digital media confuses the delineation between storage and memory, photography creates what McGarry describes as 'ghosts of futures past,' since photographs are neither memories nor storage but

create ghostly specters of the past that haunt the future (McGarry 2). According to McGarry, 19th century Spiritualists actively utilized photography's sorcery and purposely used photographic distortion techniques, often called "spirit photography," to create haunting specters of the dead that hovered over the living.

While humans might have been mortal, Spiritualists astutely recognized that the camera offered humanity the opportunity to create spirit doubles that could live on into the future. As McGarry explains, Spiritualists were not naive about the camera's distortive abilities but were in fact astutely aware that the camera's promise of immortality for humanity was bound up with a fundamental act of distortion. Rather than refute photography's distortion of the past, they instead embraced it as an opportunity to create new, creative representations of the past that actively and consciously attempted to reach into and shape the future.

McGarry's exploration of 19th century Spiritualism offers important insight for digital humanities scholarship today. In particular, digital media and photography function in much the same way in that they both confuse and distort the distinction between memory and storage. In the case of photography, this fundamental distortion of the past heralded an era of sorcery where the distortive powers of photography were actively harnessed by Spiritualists as a medium to reach into the future and create a unique image that would speak to and inspire future generations. Like photography before it, digitization also has the potential to herald a renewed age of machinic sorcery. Rather than reject digital media's volatility, is it perhaps time for digital humanities scholars to embrace a sorcery of their own?

Sailing on Encrypted Seas

When it comes to digital sorcery, there is perhaps no better place to look than the work of African and diasporic futurist artists. African and Diasporic Futurism are diverse global movements with a variety of different manifestations but can be loosely defined as movements aimed at creating dynamic visions of the future that challenge eurocentric narratives of the past (Yaszek). From Afrofuturism to Black Quantum Futurism, Astro-Blackness, and Diasporic Futurism, futurist artists tend to draw upon ritual ideas and practices from African and indigenous cultures, merging them with new technologies and scientific innovations to usher in visions of a future where African, indigenous, and diasporic communities play an active role in creating and ushering into being. As Africana studies scholar Reynaldo Anderson explains, black futurists are "reclaiming the right to tell their own stories but also critique the European/American digerati class of their narrative about cultural others, past, present, and future, and challenging their presumed authority to be the sole interpreters of Black lives and Black futures" (Anderson 228).

Figure 1. Geraldo Oliveria "Humanum Est", (2020).

A crucial component of this effort to reclaim the right to tell their own stories involves the digital repurposing of archival materials and texts that were historically used to represent the lives and experiences of African and diasporic communities. In futurist art, the archive is not dismissed or disregarded as an important artistic resource. Rather, the archive figures prominently in futurist art where it routinely serves as the primary resource for creative materials.

The recent work of Brazilian digital artist Geraldo Oliveria offers unique insight into the processes by which futurist artists creatively repurpose archival materials. In "Humanum Est," Oliveria takes an archival photograph of two African men and fundamentally transforms it with digital distortion techniques (Figure 1). The distortion technique enables Oliveria to create an entirely new landscape behind the two men.

This new landscape projects the two African men into outer space. The sun, planet Jupiter, and a large white lotus flower encircle the men. The distortion makes the men appear as though they are a space shuttle, preparing to take flight and travel across the cosmos to the planet Jupiter. The compilation of these different images imbues the image with a SciFi feel and cosmic reference point while simultaneously drawing on African imagery, cultural customs, and traditions.

Although the original image was rooted in a particular political and historical context, the digital repurposing of the image emplaces them within a cosmic and universal framework that remains rooted in the past while simultaneously pointing to an interplanetary future. In *Space-Time Collapse I: From the*

Congo to the Carolinas, art historian Rasheedah Phillips argues that such creative acts in futurist art attempt to embrace African notions of time as relational and experiential. As Phillips explains, "In many indigenous African cultures and spiritual traditions, time can be created, is independent of events, is not real until experienced, and is often intimately connected to genealogical, astrological, and ecological cycles ecology" (20).

Building upon this insight, political scholar John Ayoade has argued that Yorùbán ritual approaches time as a product or compilation of events. From the perspective of Yorùbán ritual, "Time devoid of events makes little sense" (Ayoade 99).Challenging time's presumed universality, Yorùbá society understands time as not just a subjective experience but a communal one that emerges from a community's unique experience of it within the world. Moreover, nature is not just impacted by time, but it is events within nature, such as the changing of the seasons, that determine time.

This focus on nature's impacts on time, according to philosopher Fayemi Ademola Kazeem, manifests not just a cyclical understanding of time but one with a celestial-cosmic focus: "Environmentally, time is measured either through celestial-cosmic cycle, the terrestrial-ecological cycle or both" (31). Yorùbá society balances the terrestrial-ecological, such as the life cycles of a human being, with the celestial cycles of the moon to produce a multifaceted understanding of time that emplaces the terrestrial-ecological story of humanity into a larger cosmic frame.

This astronomical or cosmic framework, in turn, challenges linear notions of time. As political theorist Bukola Oyeniyi argues, Yorùbá society understands cosmic and terrestrial events to be intimately interwoven together: "In the Yorùbá world, events have not only a relation to the past and the present but also to the future" (Oyeniyi 9). The future could thus be described as pulling the past toward it. From the perspective of Africana religions, understanding the past requires a keen understanding of the future, since the future necessitates the past just as much as the past determines the future.

According to Phillips, this explicit repudiation of time's presumed linearity is commonly reflected within African futurist art where the primary goal is to "dismantle the clockwork universe" (Phillips 15). Western mechanical conventions of time or the Western consciousness of time as fixed events moving forward along a forward-looking mechanical timeline promotes the notion of a progressive future in which the past is inaccessible. By contrast, African futurist movements embrace the cosmic or astronomical frameworks of time in Africana religions where the past is determined by the future. As Phillips explains, "Once the future event is experienced, it instantaneously moves backward into the present and past dimensions" (22). It is only by experiencing the future that one can access the past.

In addition to drawing upon Africana ritual, African futurism's unique understanding of time simultaneously draws upon the innovations and discoveries in the field of quantum physics, such as fluidity and dynamism. In quantum physics, the notion of time's mutability and subjectivity is particularly influential in futurist artwork where time is depicted as mutable as human memory. As Carlo Rovelli explains in *The Order of Time*, western mechanical conventions about time are fundamentally flawed and do not adequately capture time's volatility: "The fact that we cannot arrange the universe like a single orderly sequence of times does not mean nothing changes. It means that changes are not arranged in a single orderly succession: the temporal structure of the world is more complex than a simple single linear succession of instants" (Rovelli 10).

Building upon this insight, Rovelli explains how Boltzmann's theory about the arrow of time is commonly misunderstood and wrongly used as evidence of time's directionality. According to Rovelli, Boltzmann argued that humans attributed particularity or order to certain characteristics of matter, because they lacked the ability to see material reality in all its microscopic detail. The idea of time's direction forward was thus born from our inability to bear witness to molecules' microscopic variables. As Rovelli writes, "This is the disconcerting conclusion that emerges from Boltzmann's work: the difference between the past and the future refers only to our own blurred vision of the world" (33).

Rovelli, however, cautions that this does not make a perceived order to time entirely illusory and nonexistent, but our subjective experiences with time are what make time real: "It is a local and complex one that is not amenable to being described in terms of a single global order" (113–14). Time might be mutable, but it's mutability is what makes it real.

African futurism's amenability to quantum physics' dynamic and fluid understanding of time makes the movement uniquely suited to grapple with the temporal effects of digital technologies. Digital media does not abide by linear conventions but exists within a temporal configuration that collapses the assumed binary between past and future. The sorcery of source code takes the past and projects it back out at the user as if it were a vision of an imagined future to come. We wait in eager anticipation of the computer's processing of our commands with our necks strained and backs hunched in tense anticipation for the computer to respond to our cursor clicks.

This process is made possible by the conflation of storage and memory, since conflating the two effectively hides the complex and messy social and machinic relations that are constantly transforming our clicks and keyboard strokes into moving sounds and visions in an anticipated future. In many ways, digitization reveals the secrets behind time's illusory directionality. The screen distorts or blurs the details from the user who consequently assumes that it is the future that they see before them.

In Oliveria's digital image, this digital sorcery is exemplified in the image's paradoxical temporal framework. Situated in both the past and future, the image's unique temporal configuration allows Oliveria to visually capture the collapsing of temporal binaries. In the process, Oliveria's artwork reframes the two men at the image's center as eternal, because of their relationship to the artist who not only sees himself in them but also is astutely aware of those in the future who see themselves in his art. As Oliveria explains, "I bring in my art the aesthetics of Afrofuturism where I rescue my ancestry and reverence black culture, using historical photographs of African peoples and black personalities, adding contemporary influences. The idea is to imagine future black people, alive, strong and unique" (Jepchumba).

The manipulation of historical photographs of African peoples does not necessarily distort history, but it reorganizes history around human relationships to actualize its promise of offering revelatory knowledge of the future. Building upon this insight, Phillips explains that African futurism tends to represent the future as multidirectional, since "time depends on the quality of the event and the person experiencing it" (22). The past is not inaccessible to the future, but one can only travel to the past by experiencing the future. Past and future are thus unfolding simultaneously with the two bound together by intergenerational connections.

Oliveria's reframing of the image repairs the traditional archive's damage to his relational connection to his ancestors. According to historian Camae Ayewa, the founding moment of modernity was the fracturing of African conceptions of time and imposition of colonial mechanical conventions onto African communities with the seizure of Africans from their homes, families, and communities and forcible trafficking across the sea (Ayewa 9). The trauma of this rupture would in turn be preserved in the traditional archive with historical photographs of Africans rooting them in a particular geopolitical context and denying them the universalizing cosmic frameworks that their ritual traditions demanded.

Digital technologies' conflation of storage and memory is here embraced by Oliveria as an opportunity to challenge colonial conventions of time and repair his relational connections to past and future generations. By purposely using digital distortion techniques to change the image's background, Oliveria is able to restore his relational connections and project the two men into a cosmic or astronomical temporal frame. As Oliveria explains of his artwork on social media, "I don't want to be modern, but I want to be eternal" (Oliveria).

African futurist artist Alexis Chivir-Ter Tsegba embraces a similar temporal perspective within her work and uses digital technologies as a mechanism to create digital collages that transform mundane photographs of daily life into explorations of the otherworldly. In "Generation," Tsegba manipulates a digital photo of a group of African women pounding rice and purposely

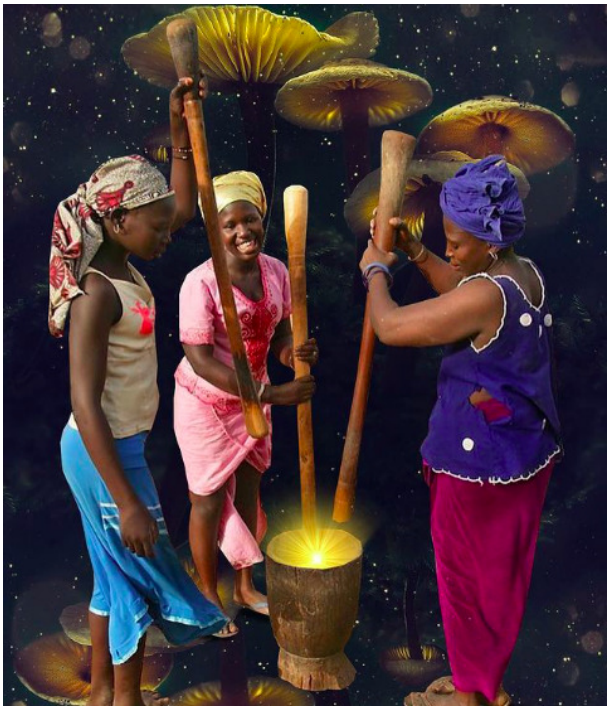

Figure 2. Alexis Chivir-Ter Tsegba *"Generation"*, (2018).

manipulates the background, enwrapping the women in gold stars and golden mushrooms (Figure 2). She also infuses the mortar with a golden ray emanating from within it.

The digital distortion of the image makes the women appear as though they are standing atop the stars and thus creates a cosmic and otherworldly feel. It is as though the image is actively inducing a psychedelic vision or trance-like state in the viewer. Inducing a trance-like state in the viewer, in turn, enables Tsegba to infuse the seemingly mundane image with sacred undertones.

Tsegba's focus on the mundane activity of pounding rice also reframes housekeeping, a duty and responsibility primarily associated with women, into a sacred, otherworldly act that sustains and ferments relational connections between past and future generations. The three women's participation in this gendered activity makes them appear as though they are eternal. The act of pounding rice is consequently transformed from a mundane, everyday activity to a medium for divine revelation between past and future generations.

"Generation" reflects Tsegba's larger concern with gender's impact on our understanding of time. In other art pieces, Tsegba explores this theme at length, using digital distortion techniques to invoke visual connections between women's reproductive experiences and cyclical notions of time. As gender theorists Ben Davies and Jana Funke explain, the idea of time's linearity or mechanical notions of time's progression forward tends to privilege men's reproductive experiences of the world. In contrast to men's reproductive experience, menstruation plays out cyclically while resisting

a linear progression of time and sharing a complex, albeit controversial, relationship to the 29.5 day moon cycle (Davies and Funke). Moreover, Davies and Funke explain that after menopause, a woman's body is 'queered' in that she can engage in sex without consequence or reproductive futurity and consequently poses a serious challenge to the progressive vision of time as bound around an unrelenting reproductive futurity.

In "Generation," Tsegba uses digital manipulation to reframe the three women within a gendered framework of eternal cyclicality. The key to this temporal subversion of linear time is the cosmic background that is digitally inserted into the photograph. The insertion of this cosmic background binds women's participation around the simple and mundane performance of pounding and preparing rice to be consumed, allowing past generations to sustain themselves and bring into being the future. Although the traditional archive might dismiss such an image as a mundane and inconsequential daily life activity, Tsegba transforms the image into an encounter with the sacred whereby past and future collapse inward on each other.

Through the application of digital manipulation techniques to the photograph, Tsegba demonstrates how simple and routine embodied actions create the very temporal framework that holds together the universe. Yet, it is only in the past that the future can be encountered and made manifest. Tsegba has not manipulated nor distorted the past, but she has seized upon digital technologies' conflation of storage and memory as an opportunity to restore a notion of time rooted in African women's unique subjective experiences of it.

Likewise, diasporic futurist artist Jean-Pierre Marchant uses digital manipulation of historical video footage to emphasize the subjective nature of time. The primary source of his films are archival footage and his personal home movies of his family and friends. Contrasting archival footage with home videos, Marchant is able to reveal inconsistencies and gaps in official archival footage and the archival record of an event. "A Life on the Borderlands," for example, tells the story of his father's immigration from South America to Canada (Figure 3). In this short film, he interlaces official government documents that document his father's immigration with home videos and his own personal memories of his father.

At various points in this video narrative, his father's official immigration documents challenge his personal memories of his father. In the case of his father's education, for example, government documents claim that his father had over ten years of schooling and education. Marchant, however, remembers that his father in reality had very little to no schooling. Archival documents are exposed as inconsistent with his own memories of his father. Moreover, the official collective memory of his father, as preserved in government archives, opposes his own personal memories of his father.

Figure 3. Jean-Pierre Marchant (2020).

At points in the film, Marchant also wonders if his memories of his father are as flawed as official archival documents. His film critically interrogates whether he misinterpreted his father's life and legacy. The interlacing of home videos and official archival images distorts his father's legacy to the point that the viewer is as confused as the film's creator as to who his father really was. The distortion transforms his father into an otherworldly being who enchants and haunts the past while simultaneously directing Marchant to his own future. The central purpose of his film is not to better understand his father but to confuse and distort his father's legacy to the point that his father becomes as unknowable and inaccessible as a God-like figure. His father haunts Marchant's memory, simultaneously pulling Marchant forward to the future and back to the past.

Like Oliveria and Tsegba, Marchant embraces digital manipulation as an opportunity to challenge the archive's progressive linear narrative and distort the archive's objectivity by interlacing the archive with his personal memories of his father. Digital distortion presents Marchant with a tool to tell his father's story from his own unique perspective as a diasporic individual. The "borderlands" referred to in the film's title refers to the temporal experience of diasporic communities who feel as though they do not exist in either the past or the future.

At one point near the film's conclusion, Marchant wonders if the future is in fact informing the past, since his own children are redirecting him back to the past and thus reversing the perceived arrow of causality between past and future. Are his children in the future in fact pulling him back to his

past? Marchant's concluding question is deeply reminiscent of Oliveria and Tsgeba's experiences of time as a deeply subjective experience, staked in the ephemeral and fleeting relationships with past and future generations.

Rather than organize time into a discrete linear flow, Oliveria, Tsgeba, and Marchant use digitization as a mechanism to confuse and distort time, rendering it into a discrete set of events connected through ephemeral relationships that render the past into a space of encounter with the otherworldly. Ultimately, their work pulls viewers to the past via the future in order to demonstrate how history only comes into being through our relational connections with those who will come after us. Marchant's experience as a father to his children, for example, is the triggering event that compels him to remember and think back on his own relationship to his father. His relationship to his children in the future are shaping his own understanding of his past.

African and diasporic futurist artists effectively reveal how digitization's volatility can usher in a distinctive understanding of time as fluid, cyclical, and mutable. In all three cases, they present the past as ethereal, mutable, and deeply entangled in the future's otherworldly and cosmic potentiality. From the perspective of African and diasporic futurism, the job of the historian is not necessarily to tie historical documents and archival materials together in a static linear narrative that points to an ever more progressive and advanced future. Rather, the purpose of history is to intentionally distort those supposed links and connections while questioning the assumed causality informing progressive linear frameworks.

In effect, digital media has fundamentally transformed the archive into a medium for revelation that shares very explicit connections to the cyclicity of the natural world. Revelation here refers to digital media's distortion of materiality as an opportunity to reformulate historiography around nature's unique time cycles. Put simply, if digital media can only regenerate the past by fundamentally changing it, then the digital archive reproduces itself in much the same way as the natural world. Just as the Fall makes the Spring possible with nature ushering in the future through the degeneration of its past, the volatility of digital archives means that the central task of digital humanities scholarship is ultimately one geared around understanding nature's cyclicity.

Tsegba vividly captures this insight and elicits the connections between digital media and nature's cycles in her recent work titled, "Receiving Light." In the art piece, she purposely uses digital distortion to drown and immerse archival material in the soft glow of the sea (Figure 4). The image of an African man resting next to the sea is interlaced with an image of an African woman's body. The interlacing of the two images makes it appear as though the man is seated on the stomach of an African woman's body with a rainbow extending from his head.

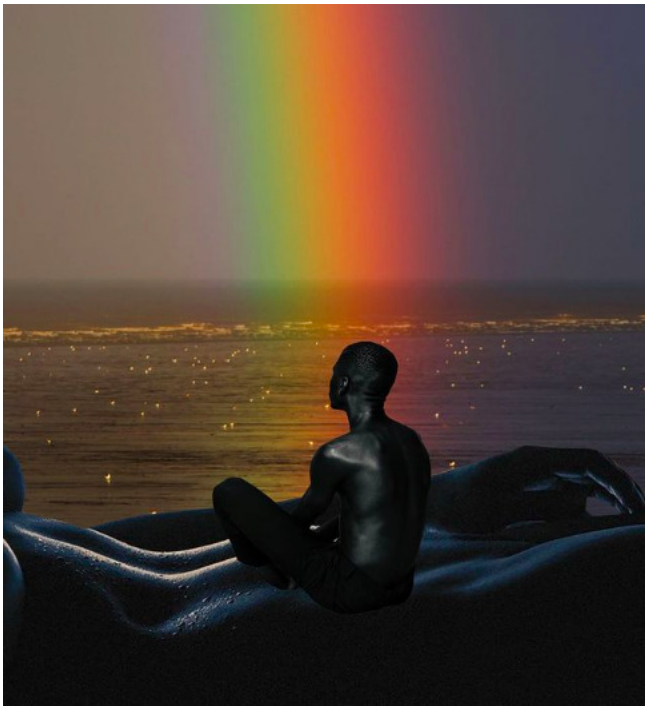

Figure 4. Alexis Chivir-Ter Tsegba, *"Receiving Light"*, (2020).

Tsegba makes no attempt to hide the fact from the viewer that the sea is a synthetic reproduction. It is not 'real' in that it was clearly produced from a software program. Yet, the application of digital enhancement and editing to the image makes the sea seem as though it is more alive. It is not passively resting in the backdrop of the image, but Tsegba uses digital distortion to pull the viewer's eyes into the sea. Tiny golden lights across the image make the sea appear as though it is electrified and pulsating with the very same energy pulses as the digital device that allowed Tsegba to create the image.

Probing the connections between digital media, the sea, and the human body, Tsegba illicites an important aspect of African futurist conceptions of nature and technology. Rather than trace digital media to the land, African futurism instead imagines digitization's origins as residing in the sea. In particular, digital media is commonly depicted alongside depictions of Mami Wata, a West African sea deity. Mami Wata's presence within futurist art is historically significant, since she is closely associated with the experiences of African communities forcibly captured and trafficked to the Americas via the slave trade. Women slaves thrown overboard became associated with the mythology of Mami Wata who were assumed to live under the sea with the goddess (Samatar 176).

Mami Wata's presence in futurist art likely recalls this history as well as the sea's capacity for the politics of cooperative adaptation. Marine ecologies are constituted by habitats, populations, and interactions among interdependent beings and the surrounding environment all working toward mutualistic symbiosis. The sea's adaptive politics and historical relationship to African ritual and slavery provide an apt landscape for African futurism to explore

how humanity and the nonhuman environment are working cooperatively together to symbiotically merge with digital media. This understanding of digital media as bound up with nature's cyclicity challenges western philosophies of technology that infer technology ferments human dominance over nature. In contrast to this approach, African futurism's effort to visualize the connections between digital media and nature demonstrate how digitization is increasingly making humanity more reliant and subject to the sea's spontaneous and unpredictable forces.

African futurism's emphasis on the relationship between digital technologies and the sea is not entirely unique, but watery metaphors have proliferated in popular culture. In *Technobiophilia: Nature and Cyberspace*, Sue Thomas explores why water metaphors are among the most powerful and popular metaphors used to describe digital media. Nets, waves, surges, floods, and surfing commonly proliferate as metaphors to describe digitization and its effects. According to Thomas, while digital media might run on electricity, marine ecologies offer one of the few ways to describe digital technologies' complex and interlocking networks, with their networking abilities operating in much the same way as water tributaries. As Thomas describes, "In my own sense of cyberspace, fanned-out fresh water tributaries pass into the spreading salty ocean beyond, then are sucked back in again by the tide along with strange new materials which fertilize yet more novel processes and tenuous hybridities, only some of which will fully develop"(54).

Perhaps more than any other watery metaphor, sea travel metaphors, such as sailing and surfing, remain among the most popular ways to describe digital media's effects. The origin of the surfing metaphor remains shrouded in some debate with scholars struggling to trace its exact point of origin. While some argue that the metaphor can be traced back to public librarian Jean Armour Polly who used the concept to describe the experience of using the internet, others trace the metaphor to the artwork of futurist artist Tom Mandel who used the concept of surfing to describe the internet at the Stanford Research Institute International Business Intelligence Program (Thomas 55).

It is somewhat odd that this watery metaphor would quickly gain traction, since the act of surfing could not be more different from the actual experience of using digital media. In contrast to the surfer who traces a path across dangerous and powerful ocean waves, someone using digital media remains static and safely seated in their chair, gliding their fingertips across the keyboard and mouse pad. How could the idea of surfing possibly describe the seemingly static and immovable experience of using digital media?

The metaphor of surfing might seem odd, but it does in fact have the unique ability to capture digital media's influence over our temporal and spatial perceptions. In much the same way as the surfer remains static on the surfboard as they glide across the water, people remain seated in front of their computers while gliding across cyberspace's temporal and spatial landscapes.

Building upon this insight, Thomas argues that Polynesian traditions approached nautical navigation and sailing as a process whereby human beings remained static with the sea traveling past them. As she explains, "When Polynesian people speak of navigation they do not conceive of themselves as moving objects traveling across the sea, but rather as static objects which the sea travels past"(60).

Building upon Thomas' insight, there is also a real danger to surfing the internet just as there is a real danger to gliding over the sea. The internet throws people into currents and flows where they may be overrun, hacked, and/or influenced into engaging in dangerous or even deadly practices. Like a sea on the verge of an impending storm, digital media is a contested sea of memory where people battle to remember against RAM's inevitable degeneration while simultaneously facing the unrelenting currents of other people's memories that constantly threaten to erase, distort, or reinforce their own memories of the past. Moreover, the metaphor of surfing or sailing aptly captures the fact that humanity largely remains at the will of the non-human environment.

When it comes to using digital media, humanity is not necessarily in control. Using digital media necessitates that a person give up control to what is essentially a non-human composite of aluminum and silicon. The metaphor of digitization as a contested sea of memory where people attempt to surf or sail across digital media's dangerous currents offers an apt metaphor to describe this complex exchange between machinic, environmental, and human social systems.

The dangers that lurk behind digitization's interface are all too real. Yet, those dangers are not necessarily insurmountable. Rather they require a unique approach that embraces digital media's tumultuous currents as an opportunity to reconnect humanity to the non-human environment.

This metaphor is an important one, since it offers a narrative framework for digital humanities scholarship that can shift away from digitization as storage and grapple with digital media's unique volatility. Metaphors have the unique ability to help us imagine and thereby create new worlds. As Thomas explains, "And once a new metaphor has been created, its very existence reconfigures the world as we know it" (5). As a contested sea of memory, digitization ushers in a distinctive understanding of time that vividly captures digital media's sorcery.

While the US military might have heralded digitization as an impenetrable storage device, African and diasporic futurist artwork demonstrates the failures of that promise. Rather than store the past, digital databases pull the past into its intersecting currents of itemsets and clusters where the past is persistently remade and reborn into ghostly hybridities that degenerate as quickly as they regenerate on our screen. Digitization's inability to store the

past, however, is not necessarily a problem that needs solving. As African and diasporic futurism reveals, digital media's volatility can usher in a distinctive understanding of time as a sea of memory where past and future are always intersecting in digitization's volatile currents and crosscurrents. It is here in the murky waters of digitization that digital humanities scholarship can embrace a sorcery of their own.

Conclusion

Approaching time through the prism of the sea at this geologic epoch where the sea remains more endangered and imperiled than ever before inevitably directs digital humanities scholarship to the future. Environmentals have routinely warned the world about the Anthropocene, a geological age where human activity exercises a dominant influence on the environment, and called for new historiographical methods that engage and cope with environmental loss while offering hopeful visions of a livable future that moves human civilization into a more-environmentally centric direction (Ladino; Nowviskie). Digitization's transformation of the traditional archive might present an opportunity to seize upon this call and build historiographical methods around envisioning a future for humanity that remains informed by the loss and tragedy of the Anthropocene while simultaneously offering hope for the future epoch to come.

The beautiful and haunting images produced by African and diasporic futurist artists like Tsegba, Marchant, and Oliveria are so compelling and enthralling precisely because of their grounded and forward-looking perspective. While themes of loss and despair saturate their landscapes, so too do themes of hope, joy, and excitement for what lies before the past. Futurism's power is bound up in its ability to inspire and move people from apathetic despair to a grounded sense of hope for the future. Just as looking out at the vastness of the ocean can calm a person, so too can digital humanities projects and research facilitate a metamorphosis in a person that compels them to reimagine their possible futures. There is no reason why digital humanities scholars cannot merge their methods with those of futurist artists. As Guldi and Armitage have previously explained, "Alternative futures became the purview of futurists and science-fiction writers only when historians gave up the field" (30).

The key behind this merger of methods stems from the embrace of digital media's unpredictability and volatility. Digital media's conflation of storage with memory does not just confuse and distort the remnants of the past, but it fundamentally transforms the past into ethereal visions of the future that vanish from digitization's watery interfaces as quickly as they surface on the murky waters of our screens. Capturing the full scale of digital media's effects on society requires embracing a dynamic understanding of time that can go beyond big data analytics and capture this otherworldly effect. Digital

distortion is not a problem for digital humanities scholarship, but it is a crucially important resource that can enable scholars to usher in grounded visions of livable futures for humanity.

It is in the murky waters of the lagoon where digital humanities scholarship finds its definitive task. The liminal space where sea meets land is an apt metaphor and one that exposes the fundamental incongruence between storage and memory at the heart of digitization. Navigating through these treacherous waters requires an acute understanding of the dangers and opportunities that lurk beneath the interface's blackscreen. As Nnedi Okorafor warns in *Lagoon*, digital media can drag down unsuspecting human victims into its murky abyss where it fundamentally transforms them into monstrous and horrifying reflections of the people that they once were. Likewise, digital humanities scholars can easily become lost in digitization's alien waters. Perhaps the only way for digital humanities scholarship to navigate such dangers is to pitch a sail and chart a path across digitization's encrypted waters.

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