Embodying the Database: Race, Gender, and Social Justice
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In Tara McPherson's groundbreaking 2012 article, “Why are the Digital Humanities So White? Or Thinking the Histories of Race and Computation,” she explains:

The difficulties we encounter in knitting together our discussions of race (or other modes of difference) with our technological productions within the digital humanities (or in our studies of code) are actually an effect of the very designs of our technological systems, designs that emerged in post–World War II computational culture. These origins of the digital continue to haunt our scholarly engagements with computers, underwriting the ease with which we partition off considerations of race in our work in the digital humanities and digital media studies.¹

She asks whether critics may “argue that the very structure of digital computation develops at least in part to cordon off race and to contain it? Further, might we come to understand that our own critical methodologies are the heirs to this epistemological shift?”² She points to Omi and Winant when she asks “how might we understand the infusion of racial organizing principles into the technological organization of knowledge after World War II”?³ Her article then juxtaposes the development and structural frames of UNIX in relation to the goals of modularity as a way to “decrease ‘global complexity’ and cleanly separate one ‘neighbor’ from another (Raymond, 85)” with urban white flight, spatial segregation and also with the literary theoretical tradition of New Criticism which became central during the cold war.⁴ As she explains from the work of Christopher Newfield and Gerald Graff, New Criticism’s “relentless formalism, a ‘logical corollary’ to ‘depoliticization’ (145) that ‘replaced agency with technique’ (155),” the critical discussion aligns New Criticism’s frames with the frames of business management.

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² ibid., 143.
³ ibid., 143. See also Omi and Winant, Racial Formation in the United States, 3rd edition, Routledge, 2014.
⁴ ibid., 149.
cultural, modular systems, and also computational modular code. The decoupling of context and relationality from textual culture becomes a means to put distance from the bodies at the center of texts, textuality, data, and databases.

McPherson wrote and published the article in a world she described as “postracial.” I think we have at this particular political, cultural, and critical moment debunked the myth of “postracial.” Her call to extend critical methodologies for literacies in “code,” “algorithms,” “interface,” have now become daily journal articles in a late fascist surveillance culture that in the last two years wants to: tell us that AI is racist and sexist; Amazon, Palantir (the offshoot company run by Peter Thiel based on the work at Cambridge Analytica) are helping locate undocumented Americans to help ICE deport them; and 23 and me and Ancestry.com are gathering your biometric and DNA profile in order to hand it over to law enforcement and others who are happy to use it for surveillance. We are bombarded every day in personal, local, national, and global ways with how very much digital data, tools, algorithms, and interfaces are not neutral. As we have watched in the last two years of elections (2016-2018), it has been palpably clear that our digital tools, our digital systems, our scholarship, our bodies are political. There is no hiding behind a sign of neutrality.

In fact, we can update this point of view by examining the work of Safiya Noble’s *Algorithms of Oppression* (2018) in which she succinctly states in the opening: “This book is about the power of algorithms in the age of neoliberalism and the ways those digital decisions reinforce

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5 McPherson, "Why Are the Digital Humanities So White?" 143.
6 ibid., 152.
oppressive social relationships and enact new modes of racial profiling, which I have termed technological redlining.”8 This article takes McPherson’s methodological call to arms for a practice that will value “broader contexts, meaningful relation, and promiscuous border crossings.”9 But it considers the longer history of data computation and Noble’s explanation that “On the Internet and in our everyday uses of technology, discrimination is also embedded in computer code and, increasingly, in artificial intelligence technologies that we are reliant on, by choice or not. I believe that artificial intelligence will become a major human rights issue in the twenty-first century.”10 How did we come to this juncture in which the 21st-century’s next human rights arena—in relation to race, gender, sexuality, disability, etc.—will be the development of AI technology? I would argue that artificial intelligence and our current discussions about its potential harm begins with an examination of our past historical interactions with computational databases and the biopolitics of data.

I will examine the database, data, and information textuality through the historical lens of a very long history of informational communication (also known usually as the history of the book), from the angles of surveillance studies, Sylvia Wynters and Alexander Weheliye’s work on black feminism and biopolitics, as well as a way to consider literary reader/response and reception theory. This article is both about the materiality of text, platform studies, media archaeology, as well as an examination in designing interactive media structures. My main point is to ask and try to answer the question that McPherson centers in her article,

“So if we are always already complicit with the machine, what are we to do?”11

10 Noble, Algorithms of Oppression, 1.
11 ibid., 152.
In this article, we will encounter what McPherson desired in a different vision of the digital humanities: “hybrid practitioners, artist-theorists, programming humanists, activist-scholars, theoretical archivists, critical race coders.” I will address the visibility and legibility of bodies and the “tactics” used in both “surveillance” and “sousveillance.” As Simone Browne explains in her book *Dark Matters: On the Surveillance of Blackness*: “[Steve] Mann developed the term ‘sousveillance’ as a way of naming an active inversion of the power relations that surveillance entails. Sousveillance, for Mann, is the act of ‘observing and recording by an entity not in a position of power or authority over the subject of the veillance.’” Thus, this article sifts through and examines the texture of databases—in telling stories of the bodies in its system, in making visible and marking those bodies, in allowing those bodies to find ways to enact sousveillance.

I tell the promiscuous history of the database: transhistorical, transatlantic, and transmedial. This is an unbound history of the database: an information and textual form that has temporal medieval beginning. As a technological informational structure, databases always have the pitfall of structuring racism, sexism, ableism, and other systems of oppression. Because a database organizes data—and thus bodies—its mechanisms of organization, its various modes of interface are always in relation to the body’s sensory experiences. The database is an eclectic mechanism of organizing communication because it is also the foundational narrative told about the digital humanities. However, what are other models of databases that glitch and rearrange our frames? I will argue that the directionality of media history does not move linearly in a progress model but rather has multiple angles and rays. Database history in the digital humanities has been told in a particularly conventional, medieval, white, progress-model way that has valorized one serendipitous and innocent origin point. This article offers a more diverse history of the

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12 *ibid.*, 157.
database precisely because data is embodied and databases have such terrible political and material consequences for certain racialized, gendered, disabled, non-heteronormative bodies. The history of the computational database in the 20th century is also the history of racialized, religious genocide.

In addition, my account is not a standard one that allows us to recover and celebrate the women and marginalized bodies that are part of these histories. We also must address the difficult histories that include the white supremacist and nazi genocidal politics that brought certain bodies to be intimately part of building and running genocidal databases. In this way, I am using Foucault’s concept of genealogies to disrupt an idea of technological progress and mythic and innocent origins. I have taken this Foucauldian genealogy of the digital humanities back because I believe we must as humanists be uncomfortable about a positivist historiography of humanities computing. I believe that if we are to shape the digital humanities, it must be with the central tenet that social justice and the ethics of data are at its center. And this is what my article tries at the end to address—are their methods and ways to disrupt, resist our situated location in these digital genocidal machines? My article’s itinerary begins in precolonial and pre-Columbian America, travels onto industrial 19th-century France and England, before a transatlantic discussion between the US and Europe. Temporally, I begin in late medieval time but in the Americas.

An Alternative History of the Digital Interactive Database: the Khipu

The first informational interface in my promiscuous media history situates us in the medieval temporal spaces of the Americas. In this case, this temporal/geographic location allows us to view slant another traditional frame—the history of the book. In Matt Cohen and Jeffrey Glover’s collection Colonial Mediascapes, they explain in their introduction how they expand past the frames of European-centered book history in order to bring other communication forms into discussion. Their expansion moves away from linear models of progress/development in
discussions of the history of the book. Inspired by the push of the work of Elizabeth Boone and Walter’s Mignolo’s edited volume *Writing without Words* (1994), Cohen and Glover are especially cognizant of Boone and Mignolo’s point that “the history of writing is not an evolutionary process driving toward the alphabet, but rather a series of coevolutionary processes in which different writing systems follow their own transformations.”

Thus, they argue that the “medium shapes, but does not determine, meaning in communication.” They move away from writing, text, book history as centered on narratives of Western European scholarship and towards “media” as a way to open up non-alphabet driven forms of communication including “performance and other-than-textual communication and reconstructions of impermanent media.”

However, this work of recasting book history in relation to indigenous histories has also been addressed by indigenous scholars. In Lisa Brooks’ *The Common Pot*, she explains:

> Just as Native writers spin the binary between word and image into a relational framework, they also challenge us to avoid the ‘oppositional thinking that separates orality and literacy wherein the oral constitutes authentic culture and the written contaminated culture,’ as Muskogee author Craig Womack argues in Red on Red. He suggests that such notion may actually hinder our understanding of a ‘vast, and vastly understudied, written tradition’ in Native America. Like Silko, Womack raises the example of the codices,” written in Mayan pictoglyphic symbols before contact, and in Mayan in the Latin alphabet afterward,’ as a ‘fascinating study in these regards.’ As he rightly points out: ‘These books were used as a complement of oral tradition rather than a replacement. The books were recited and even read in precontact schools to educate the young in the oral tradition. The idea, then of books as a valid means of passing on vital cultural information is an ancient one, consistent with the oral tradition itself.’

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16 Cohen and Glover, "Introduction," 3. They further explain that methodologically, in reference to their title, the pull from “postcolonial anthropology and on historical media studies, in which redefinition of media categories offers ways to resist the magnetism of teleological stories of cultural development that follow from the valorization of writing and print” (3).

Similarly, Silko speaks strongly about the interdependence of oral and written traditions and points to the adoption of alphabetic writing as a form of adaptation. She relates that the original Mayan codices had complementary texts that were composed after the arrival of the Europeans. She explains that they were written in Spanish and Latin 'by the first generation [of Mayan children] that the priests put in schools. And they could read and write. When they went home, the elders saw that the oral tradition could not be maintained, where you had genocide on this scale... The old folks thought about it, had people explain to them what writing was. It dawned on them; it’s a tool. It’s a tool.'  

I would also like to qualify here that as critics have aptly pointed out, indigenous writers have been readily erased from the Anglo-American record even when they have used their understanding of the settler colonial tools of empire—an understanding of the history of letters, English writing, and colonial rhetoric—to construct what Malea Powell describes, with the examples of two nineteenth-century Native American intellectuals Sara Winnemucca Hopkins and Charles Alexander Eastman, as a “rhetorics of survivance.” She writes:

Despite hundreds of years of pressure, first from European colonists then from Euramericans, American Indians did not disappear. And though our visibility has been repeatedly erased in American discourses of nationhood, we have, just as insistently, refigured ourselves and reappeared... In the Euroamerican insistence upon our absence we have become permanently present... My point is that even though we received the tools of Euroamerican cultural participation in a less than generous fashion, Native peoples have used the very policies and beliefs about “the Indian” meant to remove, reserve, assimilate, acculturate, abrogate, and un-see us as the primary tools through which to reconceive our history, to reimagine Indian-ness in our own varying and multiplicitous images, to create and re-create our presence on this continent.

And finally, to discuss indigeneity, media, and text/textuality also means we should examine Marisa Elena Duarte’s work in *Network Sovereignty*. She asks in her first chapter,

How does the concept of technology relate to the concept of indigeneity? How are the technical devices that shape contemporary day-to-day life woven into those moments that define what it means to be Indigenous?... How do these parallel imaginaries weave together? How does does thinking in terms of networks and relationships help us

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understand the way the divide between the technical and the social manifests in Indigenous contexts? Understanding the concepts of technology, Indigeneity, and networks requires an understanding of the functions that communications technology and Native peoples—Indians—completed in the formation of the modern technically advancing nation-state.

We can consider the lineage of the wireless mobile phone, before the landline telephone, before wireless telegraphy, when the railroad barons were competing in the race to build a transcontinental railroad. In the United States and parts of Canada, the late nineteenth century spelled the beginning of an increasingly industrial era of modernity, as well as a century of campaigns against Indigenous peoples...Dreams of transcontinental transportation, communication, and shipping seemed very possible with the inventions of the steam engine and telegraphy, as well as Frederick Jackson Turner’s burgeoning vision for Manifest Destiny.20

I do not believe it is just serendipity and accident that Duarte utilizes the language of the fabric arts—weaving—concomitantly with the question of technological lineages and settler colonial genocide. In this way, we can see that histories of digital and computational technologies are always wrapped up with violence, genocide, and devastating harm to the most marginal and vulnerable communities.

In considering promiscuous database histories, rhetorics of survivance, the entanglement of settler colonialism and North American, and the history of the book, I turn my gaze to a prime example of American “media” that is a form of “other-than-textual” communication is the Andean khipu. In earlier accounts—as in Samuel Purchas’s Purchas His Pilgrimes: Contayning a History of the World in Sea Voyages and Lande Travells by Englishmen and others, in his section “A Discourse of the Diversity of Letters used by the divers Nations in the World”—the South American khipu was imagined as a visual communication alphabet. As Purchas writes:

Now for the varitie and differing forms, Art hath superabounded: both in the subject and instrument, some writing with Pencils as the Japenites and Chinois, others with Pens, other with instruments of Iron as the Malabars, of Gemmes, Brasse also, or other metal, in Table-bookes, Leaves, Barkes, Wood, Stone, Aire, Sand, Dust, Metall, Paper, Cloth, Parchment, and innumerable other materials: in the forme also and manner, with Quippos in Stones or Threads, as in Peru; with Pictures as in Mexico, and the

Instead, the khipu is a tactile, haptic, indigenous database system. I offer the khipu as example in order to resist ideas of the database’s evolutionary progress model. The khipu is an alternative media history node that is part of the long history of informational communication; in addition, it demonstrates the different directions and capaciousness that databases and the bodies they organize can take.22

The Andean khipu is an early informational communication database believed to organize the census, food and agricultural inventories, the organization of villages and other population centers, calendars, genealogies, and thus various types of statistical, accounting, and narrative information. Purportedly from the testimonies of Spanish colonizers, khipus also were used to record letters, histories, family information, narrative stories.23 It is an informational media database that has a history that began before the Inka Empire (c. 1450-1532) but takes its name, the khipu, from the term for “knot” from the administrative cosmopolitan language, Quecha, of the empire.24 As a data system constructed of skin and knots, it is an interactive, haptic, mise-en-système.

Johanna Drucker, in her book Graphesis: Visual Forms of Knowledge Production has discussed how digital media environments are a mise-en-système.25 As I have written, this means that they need “multimodal reading, creation, and interpretation,” that an interactive mise-en-
système is in Drucker’s words, “an environment for action.”\textsuperscript{26} I have argued that though medieval book history invented the organizations frames of “mise-en-page”: layout, marginalia, paratext, columns, table of contents, indexes, chapter headings, medieval manuscripts can also be an interactive mise-en-système. What we find here, in the pre-Colombian and precolonial contact with the European codex, is an interactive “digital” (interfacing with the hands and fingers) mise-en-système that is an informational ecosystem always in flux in which “the main question posed is how the interface iteratively and at various moment can “enunciate” the subject/user/reader.”\textsuperscript{27}

The khipu is a digital interactive and haptic mise-en-système informational database that requires dynamic multimodal embodied making and reading. It is already always an environment of action that at its very essence is an embodied and vibrant digital system. The khipu is created by twisting, knotting, weaving various cotton and/or animal hair threads by hand (by human digits) in what has been seen by the leading scholar on Incan Khipu as a version of “binary code.” As Gary Urton explains khipu is “a system of communication based on units of information that takes the form of strings of signs or signals, each individual unit of which represents one or the other of a pair of alternative (usually opposite) identities or states.”\textsuperscript{28}

In early part of 2017, Sabine Hyland’s \textit{Current Anthropology} article have revealed that her analysis of later khipu in the Andean village of San Juan de Collata from the 17\textsuperscript{th} and 18\textsuperscript{th} centuries, may be evidence of a logosyllabic writing system that uses the different cords (using multiple forms of animal hair) and 14 different colors that allow for 95 cord patterns to create combinations that represent syllables or words.\textsuperscript{29} Hyland’s recent research also highlights the

\textsuperscript{27} Kim, "Building Pleasure," 4.
\textsuperscript{28} Urton, \textit{Signs of the Inka Khipu}, 1.
\textsuperscript{29} Sabine Hyland, "Writing with Twisted Cords: The Inscriptive Capacity of Andean Khipus," \textit{Current Anthropology} 58, no.3, available online at http://www.journals.uchicago.edu/doi/pdfplus/10.1086/691682. Daniel Stone,
complexities of a Native media item that has a long durée history from the medieval epoch to its current use in Andean life. This then is a complex, iterative, ever-changing history of an indigenous American media database. At the end of 2017, Manny Medrano, an undergraduate student at Harvard, appears to have begun to crack the khipu code which was published recently in the *Journal of Ethnohistory*.\(^{30}\) Urton with Medrano had compared Spanish 1670s census documents from a specific region in Peru:

> It was what the colonists referred to as a *revisita*, a reassessment of six clans living around the village of Recuay in the Santa valley region of western Peru. The document was made in the same region and at the same time as a set of six khipus in his database, so in theory it and the khipus were recording the same things.

> Checking it out, Urton found that there were 132 tribute payers listed in the text and 132 cords in the khipus. The fine details fitted too, with the numbers on the cords matching the charges the Spanish document said had been levelled… Medrano painstakingly generated tables of the khipu data and combed through them in search of matching patterns. This year, he and Urton showed for the first time that the way pendant cords are tied onto the primary cord indicates which clan an individual belonged to.\(^{31}\)

Both the two separate research discoveries on the khipu make clear that khipus do encode narrative information. Hyland explains that her khipus reveal that “This is a writing system system that is inherently three-dimensional, dependent on touch as well as sight…”\(^{32}\) Urton believes that the khipus may be ‘semasiographic, a system of symbols that convey information without being tied toa. Single language. In other words, they would be akin to road signs, where we all know what the symbols mean without having to sound anything out.”\(^{33}\) In other words, khipu may be a haptic, sensorial system of code.

> Its media archaeology is based on the hardware of the processed weaving of animal hair

\(^{30}\) Manuel Medrano, Gary Urton; Toward the Decipherment of a Set of Mid-Colonial Khipus from the Santa Valley, Coastal Peru. *Ethnohistory* 1 January 2018; 65 (1): 1–23. doi: [https://doi.org/10.1215/00141801-4260638](https://doi.org/10.1215/00141801-4260638)

\(^{31}\) Daniel Cossins, “We thought the incas couldn’t write. These knots change everything.” New Scientist, September 26, 2018, [https://www.newscientist.com/article/mg23931972-600-we-thought-the-incas-couldnt-write-these-knots-change-everything/](https://www.newscientist.com/article/mg23931972-600-we-thought-the-incas-couldnt-write-these-knots-change-everything/).

\(^{32}\) Ibid.

\(^{33}\) Ibid.
(“vicuna, alpaca, guanaco, llama, deer, and the rodent vizcacha”) and cotton. One of the interesting questions that Urton and other khipu scholars have discussed is who actually “made” the khipu. Who made the hardware of this database device and who structured its coded software? This question has vexed scholars because there is no definitive account that explains exactly who made them in the early Spanish colonial documents of South America. However, Urton highlights an illuminating passage from the account of a “seventeenth-century Augustinian friar Antonio de la Calancha” in his Crónica moralizada del orden de San Augustín en el Perú. Calancha describes the work of a khipukamayuq (knot maker/record keeper/reader) as follows:

the [the khipukamayuq] continually studied the signs, ciphers, and relations, teaching them to those who would succeed them in office, and there were many of these Secretaries, each of whom was assigned his particular class of material, having to suit [or fit] the story, tale, or song to the knots of which they served as indices, and points of “site memory” [punto para memoria local].

The description indicates that the khipukamayuq’s role was that of someone who could add, subtract, read, explain, and basically do data entry for this media database; others created the physical components of the media database and also set the software encoding (the framework of knots, colors, etc.). Urton explains that explicit discussion of who created the khipu’s components may have been so obvious that Spanish colonial documentary accounts do not see the need to discuss it. Andean culture had a high production and output of textiles. Women created the textiles; women would “spin, ply, dye, knot” threads. And as we see in this image from Felipe Guaman Poma de Ayala’s El primer nueva coronica y buen gobierno (1615/1616),

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34 Stone, “Discovery May Help Decipher Ancient Inca String Code.”
35 Urton, Signs of the Inka Khipu, 121–25.
36 ibid., 121.
37 ibid., 3.
38 ibid., 122. This is Urton’s translation of Antonio de la Calancha, Crónica moralizada del orden de San Augustín en el Perú con sucesos ejemplares en esta monarquía, vol. 1, Transcripción, estudio crítico, notas bibliográficas e índices de Ignacio Prado Pastor (Lima: Universidad Nacional Mayor de San Marcos, 1638; reprint 1974), 205.
there were “chosen women” who spun thread. The research, though Urton and other scholars wish there was more evidence, indicates that women made both the media database’s hardware (threads, weaving, etc.) and also created the software—the code itself to frame out the khipu as media database. Long before the Western European view of an interactive, multimodal database system constructed in binary code, we have the long capacious history of such a database built, designed, and produced by Native Andean women as a part of their deep textile weaving cultures.

It’s from Guaman Poma de Ayala’s *El primer nueva corónica* (holograph MS) (date 1615/1616), that we also have an example of how a haptic, digital interactive database mise-en-système can be translated to the European codex mise-en-page. *El primer nueva corónica’s* first written page discussing “the ‘paths’ of men and women in Incan society” has a mise-en-page layout that appears to be a form of intermediation. Laid out in a descending triangle at the top, Poma de Ayala appears to have added “lines … on the page as hanging down like cords on a khipu”. Thus, the directionality of media history does not move linearly in a progress model of mise-en-page to eventually mise-en-système, but rather has multiple paths and loops. In addition, Ralph Bauer’s article entitled “‘Writing’ as Khipu” argues that the book *Instrucción del Inca Don Diego de Castro Titu Cusi Yupanqui al Licenciado don Lope Garcia de Castro*—a 1571 collaboration between Titu Cusi Yupanqui (the 2nd to last ruler of the Inca dynasty) and “an Augustinian monk and mestizo secretary”—exposes how Titu Cusi saw European codex writing culture as a form of khipu. Titu Cusi also framed the Augustinian monk and mestizo secretary as a khipukamayuq who could take his communication and mold it to the appropriate material and

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genre forms of the Spanish documentary culture.\textsuperscript{42} These examples show that there have always been models of digital interactive and haptic media, especially beyond the Western European models that have set up ideas of progress narratives. They also reveal how media and cultural translation is multidirectional.

\textbf{Looms, Loops, Lovelace}

The juxtaposition of text/textile/textuality has been an ongoing link in the histories of media communication and especially the database. It becomes the central metaphor in a very English Romantic and early Victorian literary and science history. In this temporal/geographical instance, the history of databases returns to the texture of materiality and the metaphors of cloth and fabric in the form of the Jacquard Loom, the figure of Ada, Countess of Lovelace, and the theorization of computational database software.

The received narrative of digital databases picks up in the late 18\textsuperscript{th} c. with the silk weaving loom and the city of Lyon. As a recent critic of textile preservation explains: “The Loom, like the computer, uses a binary code for processing infinitely complex information.”\textsuperscript{43} The innovation that occurred in the Lyonnaise silk industry was Joseph Marie Jacquard’s refinement and invention of a programmable loom in order to more quickly produce silk jacquard fabric (i.e. brocade). This was accomplished through the use of paper punch cards that would direct the loom to precisely weave the silk jacquard fabric and changed the speed of production from 2 inches a day to 2 feet a day of material.\textsuperscript{44} This also put many bodies out of work who previously had hand-fed the loom patterns into the loom. The jacquard loom, invented and patented in 1801 revealed how the loom itself was the hardware of this computational

\textsuperscript{42} ibid., 325–56.
system and the punchcards were the software.

In England, Charles Babbage and Ada, Countess of Lovelace both were enamored with the jacquard loom and particularly the role of these punchcards. Augusta Ada Byron (1815-1852) was the only legitimate child of the Romantic poet Lord Byron and Annabella Millbanke.

Is thy face like thy mother’s, my fair child! 
Ada! sole daughter of my house and heart? 
When last I saw thy young blue eyes they smiled, 
And then we parted, --not as now we part, 
But with a hope.—

Awaking with a start, 
The waters heave around me; and on high 
The winds lift up their voices: I depart, 
Whither I know not; but the hour’s gone by 
When Albion’s lessening shores could grieve or glad mine eye.

Lord Byron, *Childe Harold’s Pilgrimage*,
Canto 3, 1816

She knew her father for the first month of her life and never saw him again. Her mother raised and educated her, from all accounts, in a way to try to curb any poetic and excessively Romantic tendencies—she was instructed in the logics of math and music. She and her mother circulated amongst the London salons of Charles Babbage, a well-known scientist and inventor, whose frequent guests included a varied intellectual circle among them the female mathematician and scientist Mary Somerville. Somerville apparently became keen on mathematics through her reading of Victorian embroidery magazines that included complex mathematical puzzles for their readers. At one of Babbage’s salon in June, 1833, Ada Lovelace first encountered Babbage’s Difference Engine. This was an automatic calculating machine powered by steam that used punchcards. She and Babbage corresponded for numerous years about their shared mathematical

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48 *ibid.*, 85.
and scientific interests and particularly his next iteration of his steam-powered engine, the Analytical Engine. This was never produced because of the lack of financial backing, but the ideas of it were discussed and prototyped on paper. The Science Museum of London used the design schematics of the Analytic Engine and assembled one in the 21st century.\footnote{ibid., 113-130.} In 1843, Ada Lovelace published a translation into English from the French of the Italian engineer, Luigi Menabria’s explanation of Babbage’s Analytical Engine. After this translation, Lovelace added a long set of Notes by the translator that both explained the engine but also theorized its possibilities.\footnote{ibid., 149-180. See also, L.F. Menabrea, “Sketch of the Analytic Engine invented by Charles Babbage” translated by with notes upon the Memoir by the Translator, Ada Augusta, Countess of Lovelace, available online at \url{https://www.fourmilab.ch/babbage/sketch.html} (accessed May 1, 2017).}

She writes:

The Difference Engine can in reality (as has been already partly explained) do nothing but add; and any other processes, not excepting those of simple subtraction, multiplication and division, can be performed by it only just to that extent in which it is possible, by judicious mathematical arrangement and artifices, to reduce them to a series of additions…. The Analytic Engine, on the contrary, can either add, subtract, multiply or divide with equal facility; and perform each of these four operations in a direct manner, without the aid of any of the other three. This is one fact implies everything; and it is scarcely necessary to point out, for instance, that while the Difference Engine can merely tabulate, and is incapable of developing, the Analytic Engine can either tabulate or develope.\footnote{Menabrea, "Sketch of the Analytic Engine."}

The specific difference between the possibilities of the two engines are then moved into the language of textual/textile/textured metaphor when Lovelace explains:

The distinctive characteristic of the Analytic Engine, and that which has rendered it possible to endow mechanism with such extensive faculties as bid fair to make this engine the executive right-hand of abstract algebra, is the introduction into it of the principle which Jacquard devised for regulating, by means of punched cards, the complicated patterns in the fabrication of brocaded stuffs. It is in this that the distinction between the two engines lies. Nothing of the sort exists in the Difference Engine. We may say most aptly, that the Analytical Engine weaves algebraical patterns just as the Jacquard-loom weaves flowers and leaves.\footnote{ibid.}
Lovelace identifies the vision of a “programmed computer” close to 100 years before its operational existence. She expresses this technical vision through a poetic metaphor. This poetic metaphor grounds her in what we now would identify as environmental humanities in her frameout of the computational network as a natural ecosystem. In this way, her “Notes of a Translator” become the text where the arts collaborate with mathematical science. Her article becomes the ground in which the Western European frame of the digital database springs.

Lovelace also wrote several command sequences for the Analytic machine and used, played, and refined several structural tricks—the subroutine, loop, and jump—in completing these sequences. These terms and practices are standard in computational processing and particularly reference back to importance of textiles and tactility in the history of computational databases. In particular, the idea of the “loop” becomes a way to create instructions that would allow an engine or a computer to go back and repeat a previous sequence. Lovelace thus invented the computational “loop”—as Howard Rheingold explains, “the most fundamental procedure in every contemporary programming language.”

One of Lovelace’s imagined future potentials for the analytic engine was that the engine could compose complex music. In 2015, Pip Wilcox at the Bodleian Library and a team of musicologists and computer scientists have experimented with the Analytic Engine and Lovelace’s interest in programming music. They have run a series of humanities “making” experiments that have involved a variety of techniques: “from a software simulator, a web app and the use of a computer algebra system, to construction of arduino micro controller hardware, agent based simulation and scripting for modern professional audio tools.” These experiments

54 *ibid*.
create an Analytical Engine soundscape through their computational fabrication. Steve Goodman’s essay “The Ontology of Vibrational Force,” in *The Sound Studies Reader*, explains that sound “comes to the rescue of thought rather than the inverse, forcing it to vibrate, loosening up its organized or petrified body (70).”56 This is such an experiment that makes us sensorially reevaluate the texture of the creative and technical beginnings of computational programming in relation to our contemporary bodies.

In 2015, Levi Strauss and Google collaborated to introduce a new product called Jacquard. Picking up on the history of textiles and also, one assumes, the history of computer coding, they endeavored to create a smart jacket in which conductive computer threads and textile would allow the jacket to act as a computational device.57 It is a woven, haptic computational device, a form of wearable tech, in which touch, swipes, and other tactile actions control whether you can turn off your music, rewind, explain when you will arrive at your location etc. Compared to a “smart watch,” the Jacquard jacket is also a woven, computational form of biometric surveillance.58 It can pinpoint your location and like other forms of biometric surveillance—smart watches, 23 and me, Facebook, etc.—can be used and is structured with toxic racism, sexism, ableism, etc.59 The history of jacquard becomes then a history that weaves the agendas of surveillance states and biopower over of the most vulnerable communities.

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But it is Edmond Chang’s forthcoming essay, “Why are the Digital Humanities So Straight?” that plays, I feel most intricately, with these elements of texture/text/textile of early software computing.\(^6^0\) The essay is written in code and is an actual text game that at one point asks you whether you want to play as Alan Turing, Ada Lovelace, or Purna (a character from Techland’s 2011 “Dead Island” game). If you choose Ada Lovelace, you play a text game set in the “Loom Room” filled with various woven, textured, tapestry, tufted, and embroidered fabrics. And then you come upon her image done in text code. In this way, Chang’s text/textual/textured essay/game performs a loop: it returns to the Jacquard Loom and Charles Babbage. It loops back to the woven image of Jacquard that Babbage displayed as a curiosity for guests at his Salon—the image of Joseph Marie Jacquard with his loom and the tools of his trade that on first glance appears to be an etching. But as Prince Albert correctly guessed is actually a woven textile that took 24,000 punch cards to create. It loops to the mathematical puzzles available in Victorian women’s embroidered magazine; it returns to the “lace” in Ada’s own name.\(^6^1\)

If Chang’s option to play Ada allows us to loop back to the history of computer software and database programming and the metaphors of gendered textile/textuality/text, it is Chang’s option to play Purna, the black female character in the 2011 zombie game “Dead Island” that reminds us exactly how racist, gendered, and oppressive systems are built into the coded machine. The game company that created “Dead Island” accidentally sent a copy of the non-retail version to Steam; a computer gamer unlocked the game’s coding to find out that Purna was assigned an unlockable skill that allowed her to “deal extra damage against male victims.” In the game, it’s termed “gender wars” but the code shows that it was named by the computer coders and designers “FeministWhorePurna.” If you wonder why artificial intelligence models currently


\(^6^1\) Menabrea, “Sketch of the Analytic Engine.”
are racist and sexist, you can see this as an example of how digital computational design is an extension of the bodies that create it. This is the effect of having our Digital Humanities be so white and so straight.

The creation of software to weave, loop, link algebraic code and the computational fabrication that can turn digital computer text and schematics into musical and visual art reveal the possibilities of the computational database. But always in these often awe-inspiring, breathtaking examples are the coded ghosts in these machines. As we follow the media object and texture of the punchcard, we return to Tara McPherson’s question:

“So if we are always already complicit with the machine, what are we to do?”

We will never address our complicity unless we know and address database history.

The Story of Punch Cards: DH and Data Ethics

After the 2016 presidential election, an online petition and activist group sprung up in the tech industry. Their website “never again” http://neveragain.tech posted a pledge that began to gather signatures from tech workers in the US:

We, the undersigned, are employees of tech organizations and companies based in the United States. We are engineers, designers, business executives, and others whose jobs include managing or processing data about people. We are choosing to stand in solidarity with Muslim Americans, immigrants, and all people whose lives and livelihoods are threatened by the incoming administration’s proposed data collection policies. We refuse to build a database of people based on their Constitutionally-protected religious beliefs. We refuse to facilitate mass deportations of people the government believes to be undesirable.

We have educated ourselves on the history of threats like these, and on the roles that technology and technologists played in carrying them out. We see how IBM collaborated to digitize and streamline the Holocaust, contributing to the deaths of six million Jews and millions of others. We recall the internment of Japanese Americans during the Second World War. We recognize that mass deportations precipitated the very atrocity

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62 McPherson, "Why Are the Digital Humanities So White?"
the word genocide was created to describe: the murder of 1.5 million Armenians in Turkey. We acknowledge that genocides are not merely a relic of the distant past—among others, Tutsi Rwandans and Bosnian Muslims have been victims in our lifetimes. Today we stand together to say: not on our watch, and never again. 

This pledge makes clear a central and salient point in the field of digital humanities: Bodies are a form of data; data is always embodied. What powered the Third Reich’s ability to automate the Holocaust was IBM’s Hollerith punch card machine platform. IBM Hollerith punch card platform was a technology of what Simone Browne defines as “racializing surveillance”: “when enactments of surveillance reify boundaries along racial lines, thereby reifying race, and where the outcome of this is often discriminatory and violent treatment.” The Hollerith punch card system actually was invented and then first used as a mass data processing platform to tabulate the 1890 US census. Herman Hollerith’s Tabulating Machine Company would eventually become the International Business Machines Corporation when Hollerith sold the company to Charles Flint in 1911 and Thomas J. Watson became its CEO. Thomas J. Watson is the figure that is intimately involved in both the 3rd Reich’s automation of the Holocaust and the first purported “DH project.”

In numerous digital humanities collections—A Handbook for the Digital Humanities, Defining Digital Humanities, Debates in the Digital Humanities—the history of humanities computing has been described as one that “dates back to the 1940s and the work of Father Roberto Busa, an Italian Jesuit priest who launched a tool to perform text searches of St. Thomas

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Aquinas’s oeuvre” (95). Though this genealogical history has been one of the centers of DH historiographies, I want to reconsider the geopolitical history occurring at this time in Europe.

Father Busa’s vision for a digital *Index Thomasticus* was helped by development, funding, training, and technical support from IBM starting in 1949. But it also began as a dissertation project written during WWII in Italy while “up until the end of 1945” Busa worked on Thomas Aquinas’s philosophical texts “surrounded by bombings, Germans, partisans, poor food and disasters of all sorts.” IBM sponsored this early Humanities Computing project for several decades. As Busa himself describes it, it began with the punch card system developed by IBM: “I was given an IBM 858 Cardatype, which was a kind of a transitional link between unit record and data processing machines.” In fact, the most recent book that has delved into this early historiography of DH, has called it “The Priest and the Punched Cards.”

To understand how Father Busa’s *Index Thomasticus* is linked to the 3rd Reich’s data management of the Holocaust, you have to understand how both IBM machines are basically the same computational platform that developed from 1933 into the 1950s. In addition, as a Arun Jacob’s forthcoming piece, “#haunteDH: Punching Holes in the International Busa Machine Narrative,” explains, Busa was a chaplain for the fascist Italian army of Mussolini from 1940-43 and seemed to be working on his project before the availability of the 858 Cardatype (1955) on earlier IBM machines. And in Busa’s own writing about how he came to the database for his

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69 *ibid.*, 84.
72 Jacob, 3. Passarotti (2013)
*Index Thomasticus*, Jacob points to this passage from Busa’s discussion of how he came upon using this platform for his *Index Thomasticus* in a 1980 article:

> Although some say that I am the pioneer of the computers in the humanities, such a title needs a good deal of nuancing... [O]n the stacks of the IBM library in New York City I had spotted a book (whose title I have forgotten), which was printed some time between 1920 and 1940: in it someone mentioned that it was possible to make lists of names by means of punched cards” (Busa 1980).73

Jacob persuasively argues that this book was probably the work of Gustav Tauschek, an Austrian engineer, who in 1928 patented a “a punched-card multiplier.” He worked for IBM from 1931-35 during which time IBM also acquired a number of his patents. Tauschek’s previous patents for Rheinmetall (*Rheinische Metallwaaren- und Maschinenfabrik AG*) would be bought by Dehomag, the German IBM subsidiary. Thus, this book that Busa was discussing was probably work in which Tauschek explains how a punch-card accounting machine could work to process massive amounts of named data.74 Thus, the database model in which Busa framed out the *Index Thomasticus* was based on the media hardware and process of what would be the IBM machines that powered the Jewish Holocaust.

When one examines the media archaeology of the Holocaust, what jumps out is its incredible intimacy. In 1933, for Hitler and the Third Reich to begin its first major census to gather data (primarily to identify a range of unwanted bodies in Germany and especially to identify Jewish bodies) it contracted with IBM Germany (Dehomag) *Deutsche Hollerith-Maschinen Gesellschaft mbH* for a data system to complete this task. The scope of this census and later ones included not just name, age, gender, but also religion/race, disability information, it eventually included medical information, genealogical information pulled from church registries and baptismal books, to financial information from banks (since they all used

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74 Jacob, 14.
Dehomag), and also school test scores. This allowed the 3rd Reich, after the 1st census in 1933, to begin forced sterilization for the health and well-being of the population and to start the process of attempting to biologically engineer a superior Aryan race.\textsuperscript{75} The DEHOMAG Hollerith punch card machine platform allowed the 3rd Reich to create an early version of Haggerty and Ericson’s “surveillant assemblage” in which “the surveillant assemblage sees the observed human body “broken down by being abstracted from its territorial setting” and then reassembled elsewhere…” and in this case into a punch card computational database.\textsuperscript{76} Thus, the industrial textile code moves the punchcard from jacquard loom, to a Victorian imagined computational database, to the first series of “surveillant assemblages” in the form of the creation of the US census database, and finally travels back to Europe for its devastating use in the 3rd Reich.

IBM’s worldwide policies were to never sell machines, but to always lease them, lease the parts, manufacture specific materials (i.e. punch cards themselves) for the machine, and to customize everything to each customer’s specific projects and goals.\textsuperscript{77} Thus, the IBM Hollerith platform for the 3rd Reich was custom-designed and continuously upgraded, developed, and expanded for the specifications of their largest clients. IBM would create separate specific systems from its Hollerith machine platform to design, among other things, the systematic inventory of Luftwaffe war machine parts; the entire German railroad system and its schedules and cargo; and the registration, identification, sorting, and genocide of the Jews in Germany and eventually all other invaded territories.\textsuperscript{78} IBM didn’t just supply machines and punch cards, they were intimately involved in creating and designing the entire database from the ground up.\textsuperscript{79} They worked with each project to decide what fields would be programmed on the punch card

\textsuperscript{75} Black, \textit{IBM and the Holocaust}, 52–74.
\textsuperscript{76} Browne, \textit{Dark Matters}, 16.
\textsuperscript{77} Black, \textit{IBM and the Holocaust}, 52–168.
\textsuperscript{78} \textit{ibid.}, 137–68.
\textsuperscript{79} \textit{ibid.}, 49–50.
itself, including what to use in its 60-column x10 horizontal field format. This allowed for 600 “punch hole possibilities” and thus an endless combination of information: biology, disability, location, genealogy, race, physical characteristics, income, profession, family members, etc.\textsuperscript{80}

As with the standard in the history of early computer science and computation, the bulk of the people working, fine-tuning, and processing the data were women. Thus, for example, with the first 1933 Nazi census, Dehomag used a Berlin employment agency linked to the German Labor Front, a group known for its radical Nazi leanings. They used nazi patriotism in their job call for these first positions.\textsuperscript{81} They hired over 900 plus women and trained them in a 2-week data processing immersion course. What these women did included punching in data from handwritten census questionnaires, and then they would “sort, tabulate, verify,” cross-reference and complete other data processing tasks.\textsuperscript{82} They were thus writing computational code when they translated written census questionnaires into punch card code. There has been much work in the history of computer science to begin acknowledging and boosting the women who were so integral to this field—this includes Ada Lovelace, the Bletchley Hall women in WWII, and even more recently the book and movie \textit{Hidden Figures} that discusses the African American women computers of NASA. However, less is discussed about what I would call the alt-feminism or nazi-feminism of this history.\textsuperscript{83}

Likewise, the punch cards were not sturdy, easily acquired, or stable material. Because of the “delicacy” of each Hollerith machine, the punch cards had precise material, dimensional, and other specifications:

\textsuperscript{80} \textit{ibid.}, 56.
\textsuperscript{81} \textit{ibid.}
\textsuperscript{82} \textit{ibid.}
Because electrical current in the machines sensed the rectangular holes, even a microscopic imperfection would make the card inoperable and could foul up the entire works. So IBM production specifications were rigorous. Coniferous chemical pulp was milled, treated, and cured to create paper stock containing no more than 5 percent ash, and devoid of ground wood, calc fibers, processing chemicals, slime carbon, or other impurities that might conduct electricity and “therefore cause incorrect machine sensing.” Residues, even in trace amounts, would accumulate on gears and other mechanisms, eventually causing jams and system shutdowns. Electrical testing to isolate defective sheets was mandatory. Paper, when cut, had to lie flat without curl or wrinkle, and feature a hard, smooth finish on either side that yielded a “good snap or rattle.”

Tolerances necessitated laboratory-like mill conditions. Paper thickness: .0067 inches plus or minus only a microscopic .0005 inch. Width: 3.25 inches with a variance of plus .007 inches or minus .003 inches. Two basic lengths were produced: 5.265 inches and 7.375 inches, plus or minus only .005 inch in either case. Edges were to be cut at true right angles, corners at perfect 60 degree angles, with a quarter-inch along the top and three-eighths along the side, all free from blade creases with paper grain running the length of the card. Relative humidity of 50 percent and a temperature of 70-75 degrees Fahrenheit was required at all times, including transport and storage.84

IBM had a monopoly on the cards and at various points during the 30s and 40s, 1/3 of their revenue came from the sale of cards used in data processing.85 The cards are a form of media archaeology and what they tell us about this computational processing platform is that it needed a lot of bodies and hands for it to work efficiently. These were always bespoke computation systems that required constant hands-on maintenance as well as a satellite of manufacturing units nearby that produced both parts and the cards themselves. The people who designed, built, ran, and maintained these machines were intimately involved in what these machines were built to do. This was not abstract or distance data processing. And Dehomag knew clearly that they had created a total and racialized surveillance system of the 3rd Reich’s population. They even used it to advertise their services by referencing the media material itself that made it possible—the punch card:86

84 Black, 97.
85 ibid., 98.
86 ibid., 104.
The Hollerith system was an intimate, hands-on, labor-intensive data processing method. This meant that there were also Hollerith systems at various strengths, types, and vintage at concentration camps throughout the Reich. And it’s with the example of Auschwitz that I would like to end this section because it makes so explicitly clear how much data itself is about explicit and implicit embodiment.

Starting in 1933 and with every subsequent census and then annexation of more European territory, the Hollerith system gave each Jew a number which then allowed them to be tracked throughout its system. Recently, documents have been unearthed at Auschwitz that definitively show that the Hollerith numbers were tattooed on the Auschwitz Jews during the summer of 1943, though tattooing numbers would branch into different systems afterward. This is a horrific example of “biometric identification” and an example of what Browne, Haggerty and Ericson explain as “the markings of the surveillant assemblages, that “reduce(s) flesh to pure information.”

Thus, Hollerith card information was tattooed on the flesh. As archivists have recently discovered, this means that there was an IBM customer site at the concentration camp. It was a huge I.G. Farben factory complex that was in the Monowitz concentration camp. It ran all the three major areas of Auschwitz: Auschwitz I, the camp that dealt with “transit, labor, and dentention”; Auschwitz II, also known as Birkenau, where extermination happened in gas chambers and ovens; and Auschwitz III, known as Monowitz, which was the slave labor camp. The size of this particular IBM center in Auschwitz would have included a dozen punching

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87 ibid., 351–52.
89 Browne, Dark Matters, 26.
machines, a sorter, and one tabulator. The bodies needed to run the data processing would have amounted to close to 30-40 women along with their German supervisors.  

If IBM’s participation in helping to create an indexing program for Thomas Aquinas data is one genealogy in DH, the entwined one occurring also in the 40s is IBM’s negotiations with the Third Reich to use IBM’s Hollerith punch card machine in automating the process of identifying Jews in census data, registration forms, and government records that allowed Germany to manage and automate the Holocaust, to in essence create a genocidal racialized surveillant assemblage.

As medieval graphesis (visualization of knowledge) and twelfth-century scholastic university education invented and refined the forms of the index, concordance, and table of contents, there is a rather disquieting and discomforting appropriateness to this uncanny medieval/modern digital history. This entangled Jewish/Christian history underscores the ethics of data and the devastation, destruction, and horror of computational data that fueled the birth of humanities computing. Todd Presner writes about the intertwined issues of ethics in digital humanities and Jewish studies in his article, “The Ethics of the Algorithm.” Presner references IBM and the Hollerith punch card machine to foreground a discussion of Holocaust digital projects and what he discusses as the limits and possibilities of the algorithm. In essence, IBM’s collaboration with the Third Reich and its refinement of computational census processing “invented the racial census—listing not just religious affiliation, but bloodlines going back generations… Not just to count the Jews—but to identify them.” In this case, the beginning of humanities computing, the beginning of the computational algorithm that led to Busa’s Index Thomasticus, was so efficient and complete as a database system—it exterminated millions of

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91 Johanna Drucker, Graphesis.
92 Black, 10.
European Jews. Thus, the first big data project in the digital humanities was a project of racial/religious genocide.

**Busa, Bombs, DARPA**

In 1949, Thomas J. Watson met Robert Busa in NY, and Busa convinced him to give both technical and financial support to build an *index verborum* (an index of words) for the entire Latin corpus of Thomas Aquinas, a 13th-century century Italian theologian,93 which constituted a “massive lemmatized concordance to the...writings of St. Thomas Aquinas.”94 This relation lasted several decades. There were several options when Busa decided to work through his *Index* with computation methods, one of them was the punch card system, but he had other options including Vannaver Bush’s Rapid Selector. In the end, he chose the Cardatype and punch card system. IBM helped him customize, set-up, and equip his project in a former cloth factory in Gallarate, Italy (this is also a loop and a return to the media database’s textile/textual roots). They helped him create, run, and fund a literary data processing center that was established in 1956 [CAAL]. He had a cadre of young Catholic women who became his data processing operators and did the hands-on, meticulous processing, calibrating, and data work. This early computer coding history has recently been highlighted in articles by Melissa Terras, Julianne Nyhan, etc.95

Busa not only received money from the Italian government but also from Euratom, the European Atomic Energy Community when he brokered a deal to work on an Anglo-Russian project with Georgetown Linguistics Professor Leon Dostert for DARPA (Defense Advanced Projects Research Agency) at the Pentagon. The origin myth of DH has always gone back to this

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93 Jones, *The Priest and the Punched Cards*, 2.
94 *ibid.*, 28.
story of a priest getting the IBM CEO to fund and technically support a digital medievalism project. Yet, what does not get so frequently discussed is that Busa also worked for the Department of Defense/Pentagon on a DARPA project from around 1956 to the early 60s on what was named “the Anglo-Russian project.” This Anglo-Russian Project basically was to find ways to machine translate. But Busa was not machine translating Latin, he was trying to find ways to machine translate Cyrillic/Russian science abstracts into English. Usually these were Physics abstracts and thus related to the nuclear arms race. The military-industrial complex, the frames of the Cold War, and what that means to data and the development of DH needs to be an integral part of the field’s origin story.

As the DH account @DHDarksider once tweeted, “Robert Busa wasn’t merely the first DH [Digital Humanities] enthusiast. He was the first in a long line of enthusiasts working for The Man.” In this case, Busa did not just work for one of the most powerful business figures in the first half of the 20th century—a figure not without documented examples of massive war profiteering and also intimate involvement with the data processing machinery that made the Holocaust so total and so efficient. Meanwhile, he was also working for the Pentagon, the other man of the American mid-century.

DARPA (or the Defense Advance Research Project Agency) was created in 1958 by congress as a branch of the Department of Defense. Its mission is to “create revolutions in military science and to maintain technological dominance over the rest of the world.” It is not an in-house Research Development agency but rather it “hires defense contractors, academics, and other government units to do the work.” It powered the research and continual creation of nuclear warfare, which was the focus of its developmental interests in the 50s and 60s. It is

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96 Jones, *The Priest and the Punched Cards*, 11.
97 DH Dark Sider (@DHDarkSider), Twitter post, July 18, 2014, 6:14 am.
considered either the “pentagon’s brain” or the “heart of the military-industrial complex.” It is one of the most mysterious and most independent units of the government. The good PR from DARPA that it promulgates points out it created the Internet, GPS, and “stealth technology.” Among other things, it began creating drones during the Vietnam War that it finally armed effectively during the war in Afghanistan in 2001.99

What the women were customizing to code at CAAL for Busa was Latin, Hebrew (because by the 60s he had started to work on the Dead Sea Scrolls with Jewish academics), and Cyrillic. Thus, they too were part of DH’s hidden history, a hidden history that includes an army of women coders and data processors and workers doing the hands-on, meticulous, and customized work of a Humanities database project, as well as working on the Cold War nuclear arms race. As we saw in the 3rd Reich, this was an intimate task that meant building database systems and machine interfaces from the ground up for each project and constantly reprogramming the punch card fields for the specific frames of each humanities project.

I would like to finish this portion of my article considering how the White House since 2017 have commemorated National Holocaust remembrance day, this is particularly fresh as we just have witnessed the massacre at the Pittsburgh synagogue in Squirrel Hill.100 The White House did this, from the playbook of Breitbart and the white nationalists, by erasing the Jews. Let us not re-enact a similar erasure by not confronting what the origins of one genealogical branch of the DH reveal. The digital humanities have always had the capacity for untold harm; “big data,” from its earliest inception, has always meant that the most marginalized have been targeted, deported, sterilized, and killed. The digital and embodied database when created and

99 ibid.
used has always been political. If we are to think about how to shape the digital humanities, it must be with the central tenet that social justice and the ethics of data are at its center.

The never again petition is an example of a recent upsurge in the centralization of digital data and social justice activism. We have recently seen people helping to archive the White House pages for the Internet Archive; the extraction and removal of all the data related to climate change moved out of the US; and even government agencies refusing to hand over data to the White House as a form of ethical protest. We have heard calls to erase the data of DACA students who had voluntarily turned in their information for registry during the Obama administration. And we have watched librarians, scientists, and other information workers save the endangered data being erased by our current government or mapping all the locations of government detention camps throughout the US. I wonder then have we hit another critical turn in the Digital Humanities?

Again, how do we answer Tara McPherson’s question:

“So if we are always already complicit with the machine, what are we to do?”

Designing Mechanisms of Complicity and “Train”

One answer to this question is to consider if there are ways to use the machine to underscore the ethical lesson of the 3rd Reich’s use of it for racialized genocide. I look to Brenda Romero’s work on The Mechanic is the Message. In these series of analog games that are also forms of “conceptual art.” Romero, a major feminist game pioneer, attempts to work through the experience of complicity that harnesses the mechanics of the game to make players face

\[101 \textit{ibid.}
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\[103 \text{Brian Upton, The Aesthetic of Play (Cambridge, M.A.: MIT Press, 2015), 269.}
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ethical, social, and often devastating complicity in various catastrophic world tragedies all linked
to various kinds of racial/religious discrimination. In particular, I want to turn my attention to
“Train.” All of Romero’s games—she has finished “The New World” (about the Middle
Passage), “The Irish Game” (about Cromwell’s conquest of Ireland and his slaughter of the
Irish), “One Falls for Each of Us” (about the Trail of Tears) and “Train”, she is currently
prototyping “Mexican Kitchen Workers” (which is about undocumented kitchen workers)—are
not for the public buying market and there is only one copy of each game that she keeps in her
home. She personally constructs these analog games which often means she paints the parts
individually, she builds certain props, and she brings personal items into this game world. She—
like the punch card operators—has an intimate relationship with the material and structural parts
of this game mechanism.

“Train” usually is played in organized events at universities and in art museums as a
hybrid game/art installation. She has spoken about “Train” in video talks; there is extensive
media coverage about “Train,” and a couple of videos that document groups playing train at
individual events. Otherwise, one cannot actually examine the game unless you have seen it
being played or through the filters of accounts vis-à-vis video, articles, and personal conversation
with witnesses. 104 “Train” is set up with 3 railroad tracks on top of a white framed window, with
a black Nazi typewriter at one end, and several trains and numerous wooden yellow figures. The
rules of the game are placed in the typewriter.

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104 My thanks to Brian Upton for telling me about what he saw when watching "Train" and particularly the broken
rules in the typewriter. See also Stephen Totilo, "How People Played a Holocaust Game," Kotaku, December 14,
No One Wants to Play More Than Once," The Wallstreet Journal: Speakeasy (blog), June 24, 2009,
https://blogs.wsj.com/speakeasy/2009/06/24/can-you-make-a-board-game-about-the-holocaust-meet-train/; and
Brenda Brathwaite, "How I Dumped Electricity and Learned to Love Design," talk given at The Game Developers
As Brian Upton explains, “The object” of Train “is to load small yellow pawns into boxcars and move as many of them as one can along the tracks to their final destinations. Initially, players aren’t given any context for these actions—the game presents itself simply as a logistical challenge. Only when the first boxcar arrives and the “Auschwitz” card is revealed does the metaphoric significance of their earlier moves become apparent.”

Upton further explains that what makes this game a “work of art” is “how the rules are constructed. Romero has created a set of rules that are deliberately broken. They contain strange contradictions and ambiguities. Players are forced to come up with their own negotiated interpretations as they play.”

Several different plays of the game have resulted in different actions by the players. Some have immediately—upon seeing the set-up—refused to play and so the game ends. Others have only realized after the first card is read and then spend the rest of the game finding ways to sabotage the game: players have derailed trains, released the yellow figures, or hidden the figures so that the trains arrive to their destination without any bodies. Romero describes that she has had one group and particularly one competitive player actually become swept up in the play of the game who finished the game by delivering all their Jewish bodies to various concentration camps. This group broke down after the game was “won” by the one competitive player. They began a series of angry recriminations towards this one player that reverberated well past the end of the game. This game and its effects are thus, “portable” they go beyond the space of the game itself.

Visually, several players have immediately identified the objects of “Train” as part of the Holocaust. The glass in the window eventually got smashed entirely by one player; the window signifies Kristallnacht. The Nazi typewriter links Train to the Hollerith punch card machine and

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105 Upton, The Aesthetic of Play, 269.
106 ibid.
107 Brenda Brathwaite, "How I Dumped Electricity and Learned to Love Design."
its deadly efficiency. She also used difficult-sized yellow pawns so that loading these bodies onto the train cars required player discomfort and hardship. What Romero has structured in her game design/conceptual art piece is complicity. She’s used the difficulty, horror, and excruciating discomfort of that complicity to force her players to confront their place in violent systems and regimes. The fascinating side effect to this game is that it then forces players to stretch their ethical empathy.

So to answer Tara McPherson’s question: “So if we are always already complicit with the machine, what are we to do?”

I would answer, we center that difficult feeling of complicity and we turn our labors to resist. And in the example of Romero’s train, we can see how the design of a game system can help change the stakes of a player/user/reader’s ethical engagement in the devastating politics of our world. We design our computational databases, data, algorithms, systems with the centrality of justice, with an understanding of our complicity, with reminder of our field’s terrible histories.

**Database Design and Centering the Marginal Reader**

Because it is an interactive narrative play system, one of the standard tenets in digital and video game design is that you always build for the player. Likewise, in interactive DH database and archive projects, we always design for the purported public audience. But what reader/user/player bodies are we centering in this design and building? Databases are not neutral because audiences themselves are not neutral. Our scholarly database design privileges an imagined universal community of a white, male, benign, and benevolent audience members. This is also the case for our data, our algorithms, our computer languages which have always been touted as something “universal” and “for all” but really designed for “the man.” I would argue,

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108 *ibid.*
that the “universal” audience is one linked to the white male enlightened subject. Yet, as the work of biopolitics and particularly as Sylvia Wynters and Alexander Weheliye discuss, what bodies matter? In Alexander Weheliye’s *Habeas Viscus: Racializing Assemblages, Biopolitics, and Black Feminist Theories of the Human*, he articulates a biopolitics filtered through black feminism that decenters whiteness and centralizes race in this discussion. Weheliye describes the black studies and black feminist intervention in biopolitics. Based on Sylvia Wynters work, he explains that race is not “biological” or “cultural” but rather a “conglomerate of sociopolitical relations that discipline humanity into full humans, not-quite-humans, and nonhumans.”^109^ In essence, then, race is a political system that orders what bodies matter and encompasses both the cultural and biological discussions of those bodies. Weheliye particularly critiques the discourses around biopolitics and bare life to explicate how much they have disregarded critical race studies in relation to thinking about the category of “human” and imagines a universal biological substance that is separate from race. Weheliye’s and Wynters’ work puts pressure on us to center marginal communities and marginal bodies when we build our databases. We must ask what bodies matter and what happens if we center the most intersectional and vulnerable bodies in our digital scholarly work? Who gets to be human?

There is also another urgency to center the most marginal bodies as the imagined audience community for our digital humanities databases, projects, and archives. In literary studies, two theories of textual reading—reader/response theory and reception theory, have had a long and deep history.^110^ I can point to both the scribbled marginalia of medieval readers often

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on the side margins of manuscripts to the opening of section of Samuel Purchas’s “To the Reader”. Both these literary theories focus on “the ways in which literary works are received by readers.” My focus in bringing together racialized biopolitics and reader/response and historical reception theory is to examine how both critical race studies and critical whiteness studies will change our digital design decisions. Though we have theorized and considered the worlds of the “resistant” or even “suspicious” reader, we are at a critical juncture where we must address the place and decide our engagement (or not) with the hostile, harassing reader who is interested in “alt-facts” interpretation and fascist ideological propaganda. We cannot build with a neutral “universal” audience/reader community in mind anymore because this “alt-right” audience reads neutrality in certain areas of our literary and cultural canon as a location for a white supremacist/fascist agenda.  

As a medievalist, I can say this centering has to be done by all areas in the English literary world because the textual and visual rhetoric of the white supremacists, white nationalists, and fascists—currently sitting in prominent positions at the White House—are also connoisseurs of the Middle Ages and more recently Jane Austen. There is an urgency for us to rethink our digital scholarly structures, databases, data, projects in relation to a hostile, harassing, toxic audience that will read neutrality as a form of agreeing with their white supremacist ideologies. For example, the largest number of bodies encounter the Middle Ages through digital video game culture. Yet, digital video game culture centers an idea of the medieval past as always white and thus part of a white nationalist narrative. One cannot see an image of a historical crusader without it being identified as a fascist sign. Or, as the antifascists explained their graffiti campaign at the University of Texas Austin, they identified “Celtic Cross graffiti,” a symbol for the Aryan Nation, as a white supremacist cultural sign that their own graffiti at

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specific fraternities was fighting against.¹¹² These canonical literary culture objects are not neutral anymore and they are not seen as benign. Instead, we have a hostile audience ready to repurpose them that transforms the power dynamics of these literary cultural figures, texts, and objects into a white supremacist rhetorical tool.

Similarly, there is an urgency to support, design, build, and preserve DH databases and archive projects that focus on the cultural production of marginalized groups. The same hostile and harassing white supremacist/white nationalist/manosphere reading community has been coopting these historical figures, authors, texts, and objects. For example, the Southern Poverty Law Center and Safiya Noble’s work on Dylann Roof’s digital white supremacy is an example of how cooption happens.¹¹³ Roof googled “Martin Luther King Jr.” and found a series of white supremacist sites dedicated to MLK. His further internet research led him into an information cascade in which opening up one such white supremacist MLK link would then have the algorithm suggest other similar sorts of sites.¹¹⁴ Likewise, a colleague recently explained to me that when she, several years ago, googled “Aztlán,” white supremacist/white nationalist and anti-immigration sites would be what was top of the Google search board. This is why we need to invest in work like being done by projects like “Chicana por mi Raza”.¹¹⁵

I think we can move away from the question of “Why Are the Digital Humanities so White”” to “How Do We Make an Antifascist Digital Humanities?”; “How Do We Make a Digital Humanities that Centers Social Justice?”; a digital humanities that can harness the power of DH on behalf of marginal communities? Eduard Arriaga at the MSU Global DH conference in

¹¹⁴ ibid.
2017 argued that decolonizing the digital is happening in Global South communities through open access social media platforms that communities are repurposing for their own cultural/political ends—Instagram, Twitter, Tumblr, Facebook etc.\textsuperscript{116} I agree that this is the space where digital decoloniality is occurring for marginal communities. However, I also believe that we cannot just cede the institutional space especially in this time of crisis.

I want a Resistant Digital Humanities. I am modeling this idea on what I have seen happening in the Antifascist Science Communities\textsuperscript{117} (especially #BlackandStem)\textsuperscript{118} particularly the vocal in critique of the Science March #MarginSci\textsuperscript{119} and also from a recent conference organized by the Zapatistas, the “Los Zapatistas y las ConCiencias por la Humanidad.”\textsuperscript{120} This conference focused on twinned and intertwined themes: “an interrogation of science as an oppressive force and the potential, through this awareness, to harness the power of science on behalf of indigenous communities.”\textsuperscript{121} These two should be the twinned goals of the Digital Humanities. We must interrogate DH’s history as an oppressive force and then through this awareness harness its power on behalf of marginalized communities.

I end with a new question: How do we build a Digital Humanities for the Antifascist Resistance that centers race, gender, sexuality, disability? What does a Digital Humanities Resistance look like?

\textsuperscript{117} Chanda Prescod-Weinstein, Sarah Tuttle, and Joseph Osmundson, "We Are the Scientists against a Fascist Government," \textit{The Establishment}, February 2, 2017, https://theestablishment.co/we-are-the-scientists-against-a-fascist-government-d44043da274e.