# ACCESS AND AGENCY: RETHINKING THE PUBLIC THROUGH DIGITAL HUMANITIES

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# Contents

# INTRODUCTION

Widespread access to the internet and increasingly powerful computing has facilitated unprecedented change in our world. Perhaps no moment better captures this change than during the spring 2020 COVID-19 pandemic, when governments across the globe asked citizens to stay home and corporations encouraged or mandated that employees work from home, leveraging digital technology to maintain social connections and perform jobs typically done in person. Only a generation ago, this type of quarantine might have been more destabilizing. Much like the printing press, which facilitated a shift toward print culture and expanded access to information and ideas in unprecedented ways, the technologies of the digital frontier are typically understood to be a force of good in the world: democratizing societies through open access, connecting people across continents, and automating once-difficult jobs. But the emerging digital culture, which is constantly and rapidly shifting, also presents challenges. Tools that were initially used to support democratic practices have now been weaponized by autocratic governments. Uncompromising partisanship and nationalism are on the rise. The world is facing wicked problems such as climate change that can only be solved through sustained and collaborative actions across the globe. Understanding these challenges requires us to both connect and cross communities, countries, and campuses.

These challenges are reflected on our college campuses as well. We witness conversations about why students are "forced to take" General Education requirements rather than value the perspectives gained by exploring their interests or finding new ones through different disciplinary lenses and methods. In short, there is a lack of communication to students that these requirements are the scaffolding of their citizenship and personal interactions within their choice of study. We see it in classroom conversations when students brought up within filter bubbles of social media cannot even fathom that someone may have different views, whether those conflicts arise in issues of consequence like tax policy or less threatening fare like that of comedic taste. How can we expect citizenship and public discourse if we cannot anticipate what others will or may bring to the table? All of these examples suggest contextualizing, and in some cases empathizing with, people and experiences outside your own norms is a hurdle to 21st-century citizenship--in and outside of academia. The authors present Digital Humanities (DH) as a field to engage in broader perspectives and offer informed alternatives that overcome filter bubbles and facilitate 21st-century citizenship.

What answers might the academy, and DH in particular, offer in the face of these emerging challenges? We argue that answering this question requires understanding ourselves as existing both as part of the academic ecosystem and also beyond it. These dual roles reveal the multiple publics in which we each participate and provide opportunities to increase our agency. In a globalized era of not simply information overload, the internet, and social media but of such realities as ubiquitous surveillance, data privacy concerns, machine learning, proprietary algorithms, and the Internet of Things (IoT), the geographic, conceptual, and even methodology divides that seemed useful only decades ago are overrun by the scale of inquiry and criticism necessary for today, much less tomorrow.

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Digital Humanities opens up one avenue of possibilities by increasing the connections available--between departments on campus, across campus and community, and more. In this paper, we explore the new opportunities afforded by such connections, in part by sharing the work we have each begun in our classes and our research throughout the paper. We begin by considering how seeing ourselves and our students as members of multiple publics rather than a general public, or as simply a professor and a student, opens up the conversation around the social functions of a university beyond its immediate constituents. Rather than the university being itself an academic ecosystem, we look at how the academy is but part of a larger knowledge ecosystem and how such a switch in perspective is not necessarily a threat to expertise. Imagining our academic work as part of a larger knowledge ecosystem means that our assumptions about what scholarly work "looks" like or what defines its "value" is up for debate. It also means that the academy's trend towards increased specialization might not best serve the kind of research necessary or requires more interdisciplinary teams of researchers who must work to build conceptual bridges between their disparate practices, methods, and languages. Finally, we turn to how humans and the humanities must reconsider the scope of their ecosystem in a digital age when much of what concerns us is beyond human scale.

# MULTIPLE PUBLICS AND "ACTIVATING" AUDIENCES

"The public digital humanities starts with humans, not technologies or tools, and this terrain must be continuously co-constructed. There is no place within the public digital humanities for exclusion or anti-intellectualism. No place for hierarchies: inside the academy-outside the academy; teacher-student; senior scholar-junior scholar, tenure-track-adjunct, all too distant past-inaccessible future."[1]

The concept of "multiple publics" is not a new one; however, with ever-changing technology, globalization, and movements to democratize access to information and experiences, the development of multiple identities or characterizations has expanded—yet navigating this expanse, and developing the tools to do so, remains a difficult and open question across academia, politics, gaming, and beyond. While it is certainly easier to compartmentalize our lives into distinctly separate roles, our lived experience in a digital age has moved beyond the one-to--many model of mass media, making it impractical to single out a role from the many roles one plays in independent and overlapping publics. Communication technologies from the networked computer and the internet to the smartphone and social media make our inclusion in groups evident in the structure of our digital identity and contribute to blurred lines between work and home life or consumer and producer roles in the marketplace.

Multiple fields have leveraged the concept of "the public" as part of their methodology. These approaches span media studies (audience studies), public history, Science, Technology & Society (STS; intersections of science, government, and public participation in policy), the hard sciences (citizen science projects), and civic engagement. Early approaches to "the public" have conceptualized it simply as a homogeneous "other" existing outside of a particular discipline. By contrast, in the field of media studies, "[t]raditionally we have analytically placed media power first and audiences second. With the waning (and scattering) of the term audience, we can reverse the polarities: active audience power, reactive discourses. As the active subject of production, the 'wellspring of skills, innovation, and cooperation' (Dyer- Witheford, 1999, p. 65), audience power is self-valorizing."[2] This conceptualization can clarify our thinking about how we define the public, as there is conceptual overlap between audience and publics. In other words, the public is not simply a homogenous collective that uncritically consumes media, but rather individually and actively interprets media messages and, especially in the age of the internet, can easily respond and shape that narrative. However, algorithmically created filter bubbles introduce an additional challenge to conceptualizing audiences because in many cases they are designed to artificially limit the audience to those who are like-minded. This filtering process likely plays a role in increased partisanship and the growth of extremist views because social pressure causes one to harmonize their beliefs with those "around" them.[3]  Therefore, although the internet has been conceptualized and previously leveraged as a platform for activism that increases one's agency, the use of algorithms has increased the

[1] Jesse Stommel, "The Public Digital Humanities," in *Disrupting the Digital Humanities,* eds. Dorothy Kim and Jesse Stommel (Earth: Punctum Books, 2018), 81.

[2] Jack Z. Bratich, "Amassing the Multitude: Revisiting Early Audience Studies," *Communication Theory* 15, no. 3 (2005): 262.

[3] Lee McIntyre, *Post-Truth* (Cambridge: MIT Press, 2018).

effort required to access content or reach audiences that are not already aligned with one's views.

However, each of these fields has wrestled with increasingly complex notions of publics, positing more nuanced approaches that complicate the notion of what might constitute a public. For example, some STS scholars have adapted John Dewey's pragmatist approach to argue that a public can be understood as those affected by the policies, actions, or decisions made by various organizations such as churches, governments, educational bodies, etc.[4]  In this approach, there are a variety of different and overlapping audiences that can move into and out of existence. For example, the effects of COVID-19 and COVID-19 policies in 2020 created new publics such as "essential workers" and "high-risk groups." These publics have been articulated in new ways, may overlap, and the meanings will shift as the worst effects of the virus recede. Shifting away from the concept of a general audience to the notion of multiple publics can empower communities and activate a particular multitude to form a particular "public." Presenting that process of activating a public and or inhabiting multiple publics as a reality of all community members serves as the foundation for the collective functioning of society.

However, such a sense of agency requires conscious attention to one's place in the world. In that regard, the frequent assumption students make of the "college experience" as a sort of bubble that insulates them from what they colloquially call "the real world," or the world they will live in after graduation, undermines the sense of power and purpose an education can have when applied to other realms of their lived experience. For starters, students constitute a public that is impacted by the educational institution in which they are enrolled. But even within this public, we can make further divisions. They are part of the public that constitutes students who have a stake in current institutional policies. They are part of the public that engages with faculty members to address "big questions." They are part of the alumni public that is impacted by the reputation of the institution over time. The latter two publics can certainly extend past the time spent at the university as a student.  And while students may view themselves with multiple personas within the academic sphere, those tend to end at the edge of campus, thus neglecting transformational citizenship in favor of satisfying, in the most transactional way possible, a general education requirement. A sense of public belonging and collective power gives their work purpose beyond simple evaluation for an end grade in a course and forces students and faculty to think about the applications of what they are doing.

The digital humanities (DH), however, offer a solution that allows members of disconnected communities to connect, be that what they are learning across their curriculum, what is happening in their local communities, and ultimately understanding how they fit into the broader trajectory of the human experience. Because of its inherent interdisciplinarity and emphasis on accessibility, DH is well suited to help publics develop and extend their agency to communities, networks, or ecosystems that we may or may not see themselves as a part of thus activating new audiences.[5]  Digital humanities scholarship requires students to apply skills from multiple disciplines to create robust projects. But because the end projects often live online, in an app store, or even in public places, students have to think about

[4] Noortje, Marres, "The Issues Deserve More Credit: Pragmatist Contributions to the Study of Public Involvement in Controversy," *Social Studies of Science*, 37, no. 5. (2007).

[5] The technologies of DH are platforms that bridge previous models which have attempted to connect the public in this way such as civically engaged scholarship, public history, and service learning.

the public audience that might consume whatever they create. Seeing themselves as this public audience, and furthermore, that they constitute many publics that exist outside of the university, could infuse their intellectual work with an immediate purpose. They are, for example, impacted by government laws, regulations, and policies created at the city, state, and federal levels. They are a part of a family, a cultural group, an employee. DH offers multiple ways to re-imagine these publics and engage with these publics. They could leverage augmented or virtual reality to extend projects into new places, such as historical sites or even main streets of small cities. Additionally, they move the realm of interaction outside of academic journals and classrooms and into the realm of the digital or social space, meeting the public where they already feel comfortable. Finally, a DH project alters its participants' understanding of the publics in which they take part. Most importantly, these efforts make clear that faculty members and universities are part of larger publics consisting of local communities.

As educators, we often respond first in terms of our students' needs, but in this case, we don't perceive this need for a publicly-engaged and community--oriented populace as a lacking feature of young adults or students in particular. We can, of course, turn a critical eye towards ourselves and the academic institutions we represent as Matthew Wickman has done. At a time when Academia.edu gets over 36 million unique visitors each month, he questions academia's assumption that university students are "the public" and even notes the divisive role higher education might play as "one of the (culturally) capitalizing effects of their educations is to give them an advantage over other, less-credentialed peers. In that respect, university labor also drives at least small wedges between the publics it serves."[6] Even turning to criticism of institutional and even pedagogical practices of using low-cost student labor or caching faculty research within class assignments—which students have no public recognition or choice to participate in their professor's research—draws attention to issues in how academia erases the work of student laborers, which itself is often used to devalue professional labor.[7] However, by embracing public-facing work that deliberately includes and celebrates the multiplicity of the publics we collectively represent, students and educators can realize and activate the many roles they serve beyond those defined by the classroom and the academic institution with an intentional agency.

Students are not alone in struggling to identify and engage outside of particular bubbles or identities. Several knowledge gaps might prevent people, students or otherwise, from engaging with their communities.

1. People may not see themselves (or other groups) as part of any particular publics.
2. People may observe that other community members are unwilling to see them as part of the public.
3. People may not understand how the actions of institutions are impacting them because they lack proper historical and social context.
4. People may feel powerless to intervene in social and civil processes.
5. People may feel that the responsibility to act is not theirs and that others are more interested and/or better prepared to tackle the issues.

[6] Matthew Wickman, "What Are the Public Humanities? No, Really, What Are They?" *University of Toronto Quarterly* 85, no. 4 (2016): 10.

[7] Spence D.C. Keralis, "Disrupting Labor in Digital Humanities; or, The Classroom Is Not Your Crowd," in *Disrupting the Digital Humanities*, ed. Dorothy Kim and Jesse Stommel (Earth: Punctum Books, 2018). Spencer D.C. Keralis argues that lacking funding and institutional support for the humanities frequently results in using low-cost student labor in digital humanities projects. He focuses particular attention on the practice of faculty members including their research projects as part of a class assignment. While he does not categorically claim it is unethical to include such work in a class, he does draw attention to how the classroom dynamic is not akin to crowdsourcing because of the lack of volunteerism and consent. He also looks at practices of crediting students for their contributions to digital projects and the value of Miriam Posner's efforts to write a "Collaborator's Bill of Rights" with her students.

Once such gaps are acknowledged, opportunities for agency become clearer. By understanding oneself as part of a mediated and emergent collective, it is possible to explore the idea of a distributed agency that can intervene experimentally at multiple levels.[8] These collectives consist of people of various backgrounds and knowledge coming together to collaborate or advocate for a particular cause -- an active audience as conceptualized above, though in this case, as likely to create its own content as to be active with mass media. For example, agency might be understood as actions that address each level of the knowledge gaps identified above. This expands the idea of "public participation" far beyond standard models of participatory events and incorporates activities such as knowledge-building that helps one understand which groups and publics they constitute.

By including publics beyond enrolled students, academia must also address its exclusionary practices and adapt to meaningfully include a broader constituency. This could manifest in embracing new media and forms of scholarship and structurally supporting collaboration across disciplines. It may also manifest through adopting inclusive practices that honor perspectives and narratives outside of the majority, as seen in recent citizen science projects. Citizen science projects offer opportunities for the general public to contribute and analyze data at large scales in collaboration with professional scientists. Academic institutions will certainly feel growing pains if they want to reach the transformative experience of an authentic investment in publicly-engaged teaching and scholarship as "some traditional forms of public investment reinforce hierarchies keeping the university beyond the reach of the impact many humanists seek."[9] Such practices can expand the horizons, particularly of a public university education, such that we see the network or ecosystem inside of and around the individual before the individual proper.

[8] Jason Chilvers and Matthew Kearns, Remaking Participation: Science, *Environment, and Emergent Publics* (London: Routledge, 2016).

[9] Matthew Wickman, "What Are the Public Humanities? No, Really, What Are They?" *University of Toronto Quarterly* 85, no. 4 (2016): 9.

# THE NEIGHBORLY UNIVERSITY: REIMAGINING THE "ACADEMIC" COMMUNITY

Seeing oneself as part of a particular public is an important first step in being able to act within that public. For many, a university campus can feel like a bubble or separate public that is not linked to the realities of day-to-day life. Those who feel as though they are outside of the university bubble often include community members who never attended college, community members who attended one institution but now live near another, non-traditional students, or alumni who have simply not kept in touch with their alma mater. In the "town and gown" divide, place and space play a significant role. Every place is more than its geographic location or intended function as they come loaded with connotations and assumptions that color who should be there and how they should act in that place. For example, the role of place became clear as co-author Sylvia's Communication Law and Ethics students hosted a series of public discussions about issues related to communication ethics. Early iterations of the event at public libraries did not draw significant public participation. However, hosting the event at a popular downtown coffee shop led to a large increase in participation by community members who were unaffiliated with the university. Feedback from these civic engagement projects revealed that many community members who are not currently connected to the university in an official capacity feel that they have few outlets in which they can discuss or explore the "big questions" with others and they are not looking to have those conversations in traditionally academic spaces like the university or library.[10]

Such feedback demonstrates that many community members have a desire to engage in complex humanities-based conversations, though they may not feel part of the "publics" that make up more traditional academic spaces such as university campuses and libraries. On the other hand, it also suggests that faculty members and students should more intentionally focus on seeing how they are always already part of larger publics that extend beyond the university. This might require efforts to "think outside the campus" and meet community members where they are most comfortable. To think of a different starting point than the academy is counter to the training most doctoral programs instill in their students, rubbing against institutional views on what merits tenure or earns prestige. However, the rising interest in public scholarship—thinking of the needs and interests of the public first rather than broadcasting the work and interests of an individual's scholarship—requires academics and academic institutions to rethink their priorities and their roles in the communities that they contribute to.

Rather than working through a model of distinction through difference that silos and divides communities, scholars could more actively listen to those outside of the academy and look for shared interests with a more broadly imagined community. For Maha Bali, this means more than welcoming others into your community. Instead, "inclusive communities and collaborations can only happen when we stop assuming that we can do so by simply creating the space and inviting everyone to it. We must ask what principles of learning and sharing the spaces are based on. Whose contexts and values undergird the space."[11] In leaving the classroom or academic space to work in the community, scholars and students must also consider what vestiges of those places they bring with them. In his

[10] The sheer number of articles and books criticizing the normalizing purpose of compulsory education are not surprising and highlight reasons why many would have negative connotations about schooling as rigid, abstract, critical, boring, and regulatory. Even the concept of a public education in the face of the rising number of charter schools, decreased funding for public schools, and the wildly unpopular concept of standardized testing breed negativity towards public schools in particular and intellectualism more broadly (see Erika Christakis's "Americans Have Given up on Public Schools. That's a Mistake" and David Freedman's "The War on Stupid People," both published in *The Atlantic*).

[11] Maha Bali, "The 'Unbearable' Exclusion of the Digital," in *Disrupting the Digital Humanities*, eds. Dorothy Kim and Jesse Stommel, (Earth: Punctum Books, 2018), 306.

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criticism of the academy as a patronizing system of oppressive rigor, Sean Michael Morris, a specialist in digital pedagogy, states: "So much of academic work aims at conformity. Even as we push against the oppression of the academy, we recycle and reuse that oppression in our relationship with others. As we work with one another, we frame relationships with expectations. We install and enforce—even unknowingly, even unwillingly—standards for participation in the community."[12]

Academics have long faced the problem of bridging academic work to general audiences. Their audiences are usually other academics first, students second, and the public last. If the general public is to engage with academic research, it often must be on the researcher's (or at least broader academia's) terms, which might mean reading about findings in an academic journal or looking up proceedings of an academic conference. However, much academic work is locked behind expensive paywalls, making it inaccessible without the access granted by an active university library account or a willingness to pay up to $35 per article. In its efforts to reach and include others beyond academics, the digital humanities have pushed back on the propriety model of academic publishing to promote an ethos of open access, which can take on a variety of forms. It might mean only publishing research in journals or archives that make their material freely available to the public. Or, it might mean creating work such as digital projects that live online, in an app store, or in public places. In other words, digital scholarship meets the user where they are. This gives them access and engages them with forms of media that they are used to consuming. In this sense, digital scholarship might not appear on the surface to be any different from entertainment or other informational sources that audiences already consume.

One of many such examples of a digital research project amongst the co-authors is Dr. Sylvia's *Aperveillance*, a dynamic data visualization that highlights the ubiquity of surveillance. The project created a grid constructed of recent captures of webcams that were publicly available in the greater Raleigh, NC area. These images were juxtaposed with text snippets from recent crimes that were accessed via the city's open crime database. This online experience was designed to showcase the type of watching that can be done with open data, and how intrusive this surveillance might be when combining multiple data sets. Sylvia added a screenshot from the local camera of the device being used to view the project, which ended up being the most interesting aspect of the project. While presenting the project at academic conferences,[13] Sylvia observed that even other academics were only mildly interested until they saw themselves in the surveillance, at which point they became more concerned about what data were being captured and how this impacted their privacy. In terms of publics, the viewer only saw themselves as part of the public that this data might encompass when they literally saw themselves in the data. This observation of the importance of seeing oneself led to the development of

[12] Sean Michael Morris, "Digital Humanities and the Erosion of Inquiry," in *Disrupting the Digital Humanities*, eds. Dorothy Kim and Jesse Stommel, (Earth, Punctum Books, 2018), 220.

[13] Although this project was publicly available via the internet, Sylvia was only able to directly observe the reactions of others to the project when it was presented at conferences.

the *Becoming Data* project, discussed below, which uses augmented reality to visualize the abstract ways that we interact with data.

Availability and accessibility do take on new characteristics in digital spaces not just in terms of the politics of privacy. Even in the early digital humanities work of digitizing archival collections, democratizing access has been ideologically central. Working with colleagues Katharine Covino-Poutasse and Annamary Consalvo, Elise Takehana digitized portions of the Robert E. Cormier collection expressly to make archival material easily accessible to middle and high school teachers who cannot physically visit the archives. In descriptions of artifacts, they avoided using academic language and privileged making contemporary and popular connections between the artifacts and today's social concerns or YA literature and media landscape. Not only did they want secondary school educators and students to see archives as open spaces of inquiry, but they also wanted them to see their dialogic value with the world beyond the archive. The first iteration of the digital exhibit even included a comment feature, allowing user comments to essentially become part of the archive, a sentiment Robert Cormier shared as he frequently told students he was sending their work to his archive. However, managing the onslaught of bot comments became too cumbersome to continue. In this regard, maintaining accessibility necessitates constant curatorship, not just in the pesky act of updating code or batting away bots, but in representing and contextualizing the entire collection through the artifacts selected for digitization. The work of preparing such exhibits, as is preparing data, does not carry the same awe and prestige of later analyses of these materials. This undercuts the work and expertise required and devalues scholarship that is accessible and adds to both the field's and the public's body of knowledge.

Because the internet is an open platform and a marketplace of ideas, anyone can have a voice. This has been at times democratizing, such as during the Arab Spring in 2010 and 2011, but at other times it has hastened the decline of expert knowledge by, for example, facilitating the rise of viral fake news. This tension can be seen in the core philosophy of sites like Wikipedia, which philosophically believe that the sum of collective knowledge can be just as accurate, if not more accurate, than the knowledge of an individual academic expert (the core philosophy of the now-obsolete encyclopedia). But it would be a mistake to interpret this shift as one hostile to academics, as experts can still be a voice in internet communities. Wikipedia has moved toward a model of gatekeeping editors over the years to prevent malicious edits. Furthermore, in an era of "fake news," more and more people might place special value on input from academic experts who meet them in everyday online communities where the public seeks out content: YouTube, Reddit, Twitter. These social media platforms have, in many ways, become a focal point in the struggle to understand and evaluate expertise. Twitter, for example, has taken aggressive action to prevent the spread of disinformation, especially during the COVID-19 pandemic in 2020. This has included labeling posts by President

Donald J. Trump as in violation of their terms of service, and temporarily restricting the account of his son, Donald Trump Jr., for sharing a video that contained misinformation about the virus. At the same time, they extended efforts to verify accounts of public health experts who can share their expertise. Yet, these actions, and the expertise that they value, are not uncontroversial. Many conservatives have begun using the social media platform Parler as an alternative to Twitter because it is more lenient in its content moderation.

Academics are increasingly entering into these public conversations. One of the authors, historian Joe Wachtel, demonstrates this in his work. Public historians have long emphasized "the public" as their primary audience--their job is to undertake and apply the same research methods of the professional historian to create an experience for non-academic audiences; in a sense, they have long engaged with this problem of open access. However, historical sites face many of the familiar challenges of the 21st-century, such as smartphone addiction. Visitors to sites often spend their time scrolling through their phones rather than engaging with the physical landscape they are visiting. For the public historian, this breaks the immersion that the site's team has so carefully constructed. Because smartphones are such a major component of our lives, it is not feasible to enact a policy preventing site visitors from using their devices (at least, not without the risk of alienating audiences). Instead, historical sites can leverage smart devices into an advantage; using gamification and augmented reality technologies, sites can integrate devices into the experience. In this way, the smartphone becomes a tool that encourages visitor interaction with the physical space and in some cases, gives visitors active roles in curating or narrativizing their experience. This technology has only become ubiquitous in the last few years, having previously relied on expensive equipment installed at the site itself. By migrating the technology onto the user's device, cash-strapped museums and historical sites can more realistically provide access to visitors. While AR's usage has been rapidly expanding, its potential for future integration—particularly as smartphones become more powerful and GPS tracking becomes more accurate—means that this type of access is still emerging.[14]

Wachtel's collaborator, game designer Jon Amakawa, has worked on integrating interactive media into museum settings and, since the advent of augmented reality, has been involved in transitioning historical sites to use AR technology, including projects commissioned by the National Parks Service. Amakawa's AR app *New Philadelphia AR* recreates the settlement at New Philadelphia, a National Historic Landmark in Pike County, Illinois. Settled in 1836, New Philadelphia is the first town registered by an African American (and former slave). What makes it a strong candidate for augmented reality is its relationship to space: the town no longer exists, and the site is an empty field in rural Illinois. Rebuilding the physical landscape would be prohibitively expensive, but using augmented reality, anyone with a smartphone and data connection can experience New Philadelphia as it might have looked in the 1830s. Not only does Amakawa's app engage the audience where modern audiences are by using their smartphones to interact with space, but it also allows an important but underfunded site to provide access to their historical interpretation when they might otherwise not have been able.[15] In 2016, a group

[14] Arielle Pardes, "For Museums, Augmented Reality Is the Next Frontier," *Wired*, 21 September 2018, https://www.wired.com/story/museums-augmented-reality--next-frontier/.

of history and game design students at Fitchburg State worked with the Museum of Russian Icons to create a historical AR app to augment their collection of mineias—church calendars that depict feast days of the saints. The app allows visitors to learn about each saint by "clicking" on the appropriate date on the calendar through the augmentation of a smart device installed at the museum.

The very nature of augmented reality—linking digital content to physical markers or GPS locations—not only brings places, their history, and their populations to life, but it also concretely demonstrates the ubiquitous interest in public inquiry and communal knowledge. When coauthor Elise Takehana worked with students to create *When We Were Normal*, an augmented reality tour of Fitchburg State University's past, they were enamored by the feeling of having a deeper knowledge and context of a place they all overlooked as a backdrop to their everyday lives. Some began their research with an interest in their major or on their club affiliations to ultimately find information on the fraught construction of Conlon or a prize-winning car rebuild covered in the *New York Times*. Such knowledge and knowledge production can breed a sense of belonging and responsibility to a collective that more transactional attitudes towards learning elide. Particularly striking to students was the role of the student newspaper and yearbooks played in telling the cultural history of the campus. As is typical, what appears in the official record glosses over the lived experience of people in the community. Students who worked on the project had a newfound appreciation for their student newspaper and local news more broadly. They saw that it was voices like theirs that wrote history both then and now.

Taking students out of the classroom and onsite means that they can leave some of the assumptions of the academic institution behind—providing physical distance to help dismantle the university filter bubble and illuminate the membership in the community. DH projects can reimagine education and step away from the transactional assumptions of education. While the iTunes U model of freely sharing recordings of entire University course lectures would provide ready and equal access to high-quality and credible resources that would have been otherwise unavailable to them, such a model of pushing out academic content to the general public continues a narrative of commodifying education rather than promoting an open and collaborative community. While "students" could learn from these lectures, without paying for the course, they cannot receive credit. This model fits the expectations of a university and even of its faculty, but to the audience, such a model feels all too similar to a "pay to win" model of gaming.

Without even leaving the academy, the rising cost of a public education aggravates classist barriers and puts colleges and universities in the position of justifying their monetary value to an individual rather than their holistic value to a community. Even in the efforts of public scholars to provide a broader value to a larger community, the assumptions and function of the academy still manage

[15] Jonathan Amakawa and Jonathan Westin, "New Philadelphia: using augmented reality to interpret slavery and reconstruction era historical sites," *International Journal of Heritage Studies* 24, (2017).

[16] Aimée Morrison, "Of, By, and For the Internet: New Media Studies and Public Scholarship," in *The Routledge Companion to Media Studies and Digital Humanities,* ed. Jentery Sayers (New York: Routledge, 2018), 59.

[17] Michelle Moravec, "Exceptionalism in Digital Humanities: Community, Collaboration, and Consenses," in *Disrupting the Digital Humanities,* eds. Dorothy Kim and Jesse Stommel (Earth, Punctum Books, 2018).
While the ethos of community, collaboration, and democratized access is foundational to the digital humanities, there are certainly criticisms of how such ideologies come into practice. For instance, Michelle Moravec, in conducting a discourse analysis of DH manifes-toes, definitions, and tweets under hashtag #digitalhumanities, found that many descriptions of commu-nity were utopic and largely general, especially as it came to addressing the audience for DH work (176). This trend could make it hard for DH practitioners to explicitly address "issues of power and identity" (184). Moravac's concern is that "because digital humanities describes itself as an open and encompassing community, and at times as even a 'model,' dedicated to greater 'democratization,' it sets itself up to be held to a higher standard" (185).

[18] Helen J. Burgess and Jeanne Hamming, "New Media in the Academy: Labor and the Production of Knowledge in Scholarly Multimedia," *Digital Humanities Quarterly* 5, no. 3 (June 27, 2011), accessed February 12, 2020, http://www.digitalhumanities.org/dhq/vol/5/3/000102/000102.html.

to co-opt such work, as sociology professor Aimée Morrison notes in a reflection of her 15 minutes of social media fame surrounding her tweet of sexist children's clothing. For Morrison, "a culture of academic micro-celebrity and personal branding" promotes the neoliberal university by "bringing reputational currency and prestige to the university and promoting a purported democratization of knowledge without truly changing anything."[16] The academic space, with its history of exclusion, distinction, rigor, and tradition, does not yet serve a 21st century imagining of community space and work that privileges action and accepts the reality of digital, decompartmentalized lives.[17]

Despite the many potential benefits of public-engaged digital humanities work, it is worth noting, at least in brief, that the structure of academia presents several challenges to such approaches. First, Morrison acknowledges how the safety of the ivory tower has sheltered vulnerable academics and allowed for controversial or progressive work to grow. For her, public scholarship is a challenge in the age of the internet, precisely because it breaks down the ivory tower. If one goal of academia is to explore new areas of thought and challenge established norms, this scholarship will likely create conflict with portions of the community. In the era of troubling movements such as GamerGate, untenured faculty and women and BIPOC faculty members may face greater risk if their work provokes even unwarranted public outrage. This suggests a potential need for balance in the work of scholars that includes meeting the public where they are but also still working to explore new areas of thought.

Second, there are always questions and misconceptions about what scho-larship means across disciplines. At large research universities, there is often a pressure for depth in the field—and more siloing—and digital work may not count toward evaluation and tenure standards for candidates in the same way that more traditional, written scholarship is evaluated. For example, Burgess and Hamming note that "Coding, shooting and editing digital video, interface and information design, data-basing, troubleshooting, debugging: these activities often fall outside the purview of traditional notions of humanities scholarship."[18] Therefore, scholars working in areas that utilize these skills are at risk of not achieving tenure, espe-cially when evaluated by scholars across a variety of departments that differ in their understandings of what constitutes scholarship. The lack of a standardized peer review process for digital projects that mirrors the process of more traditional writing or publishing also presents a hurdle, as peer review is often considered the gold standard for asserting quality in academia. However, recent projects such as the *Reviews in Digital Humanities* journal are working to address this gap.

Finally, one question which must still be addressed is the reliance of digital academic projects on often commercial tools or resources. What happens if these companies go out of business and the tools cease to exist? Or how are projects managed and archived as technologies continue to develop in new directions? For example, Sylvia's *Aperveillance* project came to an end when the majority of webcams on which this project relied upgraded to new software that processed and served the images differently, making them inaccessible as individual image files. When this change was made, the project was no longer functional and would

require a major reworking of the code and significant time investment. His subsequent project, *Becoming Data*, relies on the operability of the Microsoft Kinect with computer systems. Although this operability is likely to remain for the foreseeable future, it is not hard to imagine a point at which the Kinect itself will be outdated and no longer supported.  Because the content of the first project and the tools of the second project rely on third parties, ultimately the longevity of these projects is out of the hands of the creator. Similarly, because maintaining smartphone apps requires technical expertise that extends beyond the training of historians, public history sites must worry about long-term support for their apps.

While digital humanities offers exciting new opportunities to build agency by connecting sometimes disparate publics, there remains a risk to the scholars who choose to take on such work. Therefore, it will remain important for scholars who work in this area to use discretion regarding the types of projects they pursue, taking into consideration their safety and job security (or lack thereof) within academic institutions. Additionally, as this type of work becomes increasingly common within the university, some of these hurdles and burdens will be reduced. For instance, as such work becomes more accepted, perhaps new approaches or even alternatives to challenges such as peer review will emerge. In the next section, we consider other ingrained patterns of an academy structured upon disciplinary divides, which the digital humanities might productively challenge in ways that further increase agency.

# AGENCY THROUGH INCLUSIVE COMMUNITY BUILDING

Because the field of digital humanities does not exist within nor has it grown exclusively out of any particular discipline, it offers an opportunity to intervene in patterns that have become ingrained within university systems. The emergence of particular disciplines and departments that can be siloed off from one another is one prominent example of those patterns. Prior to the 1900s, logic and rhetoric were the primary skills taught as part of the educational process. This shifted in 1892 when a group of educators laid out a plan for a standardized K-12 curriculum to be divided into disciplines such as reading and writing, math, and science.[19]  Higher education followed a similar path by organizing into departments in the late 1800s.[20]  While rhetoric was primarily taught in Rhetoric and English departments, rhetoricians separated into a new department of Speech for the first time in 1914. By the mid-1900s these departments began to transition into more general departments of communication, and the focus on rhetoric was often diluted. These departments then began to specialize in specific areas of communication research, first broadly in terms of humanities or social science approaches, but then more specifically into areas like media, cinema, and game studies, for example. This move of departments into more specialized areas reflects the path that many departments have taken over the past century.

The increasing number of Ph.D.s granted throughout the twentieth century also facilitated this process of specialization. Between 1910 and 1919, universities granted an average of 546 Ph.D.s per year in the U.S. By 2000-2006, that average rose to 41,998 Ph.D.s per year.[21]  This represents an approximate 2000% increase in the number of doctorate degrees awarded per million people during this time period.  The requirements for earning a Ph.D. include developing new knowledge in a specific area, and as more people receive degrees, this new knowledge is most often developed in smaller and smaller niche areas of study. Focusing on such a small niche can sometimes make it difficult to fully appreciate the connections to the larger field of study, and especially other disciplines, as each discipline draws on specialized language that may not "translate" well to other areas.  The very organization of universities into these departmental silos coaches students into viewing the world and themselves through the lens of individual disciplines, rather than seeing overlaps and points of rich collaboration across disciplines. These processes of specialization contribute to the stereotype of the university as an "ivory tower," or, in more recent years, part of a system of "coastal elites" that are disconnected from the daily life of the communities that surround them (the town/gown problem). This disconnect can leave some people unwilling or unable to accept universities, faculty members, and students as part of the publics that make up the community—which works against rather than expands agency.

In contrast, the digital humanities is, at its core, interdisciplinary, which has allowed for a shared, collaborative language and methodology to emerge. In its earliest form, the digital humanities emphasized greater access to information for scholars and students regardless of their discipline, with a specific focus on information literacy, increasing digital access to databases, aggregating data, and digitizing documents. Everyone benefited from this emphasis on more open access. This ethos of open access means these materials are also available outside of academia and available to anyone who would like to access them.

[19] Jonathan Haber, *Critical Thinking* (Cambridge: MIT Press, 2020).

[20] Michael Dues and Mary Brown, *Boxing Plato's Shadow: An Introduction to the Study of Human Communication*, (New York: McGraw Hill Companies Primis Custom Pub, 2001).

[21] Barry R. Chiswick, NicholasLarsen, and Paul Pieper, "The Production of PhDs in the United States and Canada," *IZA Discussion Papers* no. 5367, (December 9, 2010), accessed March 14, 2020, https://papers.ssrn.com/sol3/papers.

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The digital humanities can provide a bridge that may help mitigate the challenging practices and assumptions that undermine disciplinary silos. As public perception of the value of a university degree has swung in the direction of job training, the perceived value of the humanities has declined because it is not perceived as offering practical job training.[22] This means that humanities departments struggle with small budgets and are often the first to be eliminated during economic downturns. Yet, STEM departments also face challenges. Though such degrees are in high demand, students leave STEM majors at a higher rate than any other field[23] and the gap in representation among women and people of color reflects challenges faced by these disciplines. For example, one of these challenges is the process of "gatekeeping," or only allowing high achievers, who are often perceived as having "natural" intellect, into the field. This systematic problem can be observed occurring as early as elementary school. Students in STEM fields often discount their ability to learn beneficial humanities-based skills such as writing or drawing. This disciplinary siloing is reinforced every time a STEM student echoes a sentiment such as, "I'm not a writer," or a humanities student laments, "I'm not a math person." Growth mindset research has demonstrated that these limiting frames are not true, and one can learn to write or do math if they both believe that they can learn new things and work hard toward that goal.[24] Digital humanities provide a needed bridge between these relatively newly siloed fields because the projects being developed demonstrate the need for and importance of skills from both the humanities and STEM.

There are those in both fields who willingly choose to remain uninformed by a pressure for depth and recognition in a microscopic field, lack of incentive to do so, or lack of respect outside one's field. For example, the WAIVS[25] project connected philosophers, artists, and computer scientists in museums, universities, and with the general public. However, the project required students (in set majors) and faculty (in set disciplines) to choose to learn how to speak each other's language. This included learning what they did not know, learning what they did not know they did not know, and choosing to communicate outside the typical guidelines of the discipline. Co-author Buell observed that there are disciplinary barriers to this collaboration in each area that created major hurdles to the communication process. Artists and philosophers working on the project admitted that there is often a goal in their discipline to "out word each other" and purposely make things harder to understand to make themselves seem smarter. The mathematicians and computer scientists are similarly competitive but take the opposite approach—they leave out explanatory pieces because they believe that if one cannot figure that, then they are not at the same level of understanding. Said another way, this meant that the mathematicians and computer scientists had to use more words and the philosophers and artists had to use fewer for the collaboration to work successfully. While the students did not want to exit their silos, they were more willing to do so than faculty, raising important questions about why experts do not want to be transparent, concise, and direct. Nonetheless, one important outcome of the WAIVS project was that it helped collaborators redefine their ideas about how their education and discipline

[22] Edward Conard, "We Don't Need More Humanities Majors," *Washington Post*, July 30, 2013. https://www.washingtonpost.com/news/innovations/wp/2013/07/30/we-dont-need-more-humanities-majors/.

[23] Xianglei Chen, "STEM Attrition: College Students' Paths Into and Out of STEM Fields," Center for Education Statistics, November 2013, https://nces.ed.gov/pubs2014/2014001rev.pdf.

[24] Carol Dweck, *Mindset: The New Psychology of Success* (New York: Ballantine Books, 2006).

[25] WAIVS, 2016, http://waivs.org/

contributed to society and to solving complex problems—both in and out of the digital humanities. In working with others across a range of technical skills and disciplinary backgrounds, digital humanities scholars can extend their reach and broaden their value to a community.

As the WAIVS project made clear, students and scholars who do possess appropriate technical skills might not have exposure to the disciplinary humanities research or interpretive skills necessary to develop robust humanities content. For example, how does a digital artist render a landscape that is not only imaginative but also grounded in the human experience? This problem gets particularly sticky when creating real-world—particularly historical—environments.[26] How does a 21st-century person create an accurate virtual representation of the past? This was the basic question facing co-author Wachtel when approached by game design colleague Amakawa in the spring of 2015. Amakawa wanted his students to create robust historical environments in his 3D modeling class but found that students relied too much on tropes and stereotypes or copied visuals from internet image searches. In other words, students training in digital design understand the technology and possess a variety of artistic skills, but they lack exposure to the humanities background required to give essential nuance to their work. Wachtel suggested a solution: give students an early modern travel narrative—journals from historical travelers who went to great lengths to describe the new places that they encountered.

This is a complex and multi-faceted assignment. Not only does it require students to imagine and produce imagery from text on the page, but students must also learn to peel back the multi-faceted layers within travel narratives them-selves. For example, to what extent does a 16th-century missionary understand the peoples that he encounters across the Indian Ocean or Atlantic world? To answer this question, the digital creator must understand the author's historical context and the presuppositions that a 21st-century reader brings to the text. This is fundamentally a humanities problem. Amakawa and Wachtel seized the opportunity to add history students to the project, creating multidisciplinary teams that emphasized technology, artistic vision, and historical interpretation. History students benefited, too: used to working within the boundaries of histo-rical research and writing, they learned the realities of budgets, project timelines, technical limitations, and arguments over artistic license. Ultimately, in late 2016 Amakawa and Wachtel used interdisciplinary teams made up of primarily game design students and history students (with a mixture of students from English Studies and graphic design) to create digital exhibits for the Museum of Russian Icons in Clinton, MA. Students conducted and interpreted historical research, interacted with the client, and produced vibrant augmented reality displays for the museum. Everyone benefitted: The museum could put themselves at the forefront of digital history, history students better understood the potential career uses of their interpretive and analytical abilities, and game design students engaged in tangible application of their technical skills. More importantly, it showed all students the necessity of interdisciplinarity in 21st-century workplace environments: historians understood how to work with technical and professional

[26] Andrew Reinhard, "Video Games as Archaeological Sites; Treating digital entertainment as built envi-ronments," in *The Interactive Past; Archaeology, Heritage, and Video Games*, eds. Angus A.A. Mol, Csilla E. Ariese-Vandemeulebroucke, Krijn H.J. Boom, and Aris Politopoulos, 99-112. Leiden: Sidestone Press, 2017.

limitations, and game design students learned how to interact with the past using proper historical methodology.

Amakawa and Wachtel now teach History by Design, a co-taught, interdisciplinary course built around these principles. In multidisciplinary teams, students conduct historical research, interpret the past, and design virtual game exhibits for historical sites. Under the guidance of both historian and game design faculty, students learn how to use the technical skills of history and apply game media and interactive design toward the creation of public-facing educational media and exhibitions. This includes learning how to conduct research like a professional historian, how to interpret and write about the past from that research, how to work with clients in public history, how to present nuanced arguments about the past in digital environments, and the technical and artistic skills required to create those environments. Past iterations of the class have built exhibits around sites along the Freedom Trail in Boston and Battle Road— the sites involved with the Battles of Lexington and Concord. In this project, the digital humanities shine by applying traditional humanities methodologies in new ways to create future-forward exhibits for 21st-century audiences.

The digital humanities have continued to grow in this spirit of interdisciplinary collaboration over time. On the one hand, the digital humanities are still not anchored in a particular discipline or modality of thought. But as the field grows, there has emerged a more practical problem: it's often impossible for one scholar trained in a particular discipline to possess all of the skills required to undertake digital projects, potentially shifting the perception of academic research in the humanities as less of an individualistic, single-author model of value to one that is predicated on teamwork and collective production in a more immediate way than the Burkean parlor model, though not a complete replacement of it. For instance, when discussing Marc Saporta's *Composition No. 1*, a loose-leaf novel with a supposedly randomized structure, Elise Takehana and her students ran up against several questions about the potentially strong cohesion of the story despite its material presentation. A corpus study of its pages alone would offer some insight into how randomness and cohesion might overlap in the work. Furthermore, the back of each page presents a piece of typewriter art that resembles topological charts. The potential patterns or connections in the visual material and its relationship to the textual might offer even more information. Not being a linguist, mathematician, or computer programmer makes it challenging for Takehana to answer the questions she and her students both have about this novel. In this case, close reading practices are not the best methods of addressing such inquiries, at least not alone.

As digital access to information has become the new normal, the digital humanities have become more concerned with how new technologies can assist with both analyzing data and representing findings in new ways. This presents scholars with new obstacles that can be solved through interdisciplinary collaboration. For

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example, a sociologist, historian, or political scientist might possess disciplinary methodological training to interpret data to draw conclusions, but they may lack the software experience required to imagine new ways to visually represent that data (such as 3D printouts). This is the major factor limiting how humanities scholars present their data—websites, video games, and other forms of interactive media that might be otherwise well-suited to the project might also not be feasible if the researcher does not know how to develop a website, program a video game, or create interactive media using video editing, 3D modeling, or graphic design software. Learning how to use such tools well also requires a significant time investment, which is not always feasible.

Such gaps in knowledge can instead be seen as opportunities to engage new audiences. For example, Girls Who Code has leveraged the digital humanities as an engaging access point for digital and computational knowledge for young women 6-12 years old. The group encourages projects that combine social reflection and cultural events into coding problems. A glance through the Girls Who Code projects[27] demonstrates the critical intersection of social, cultural, and political topics—including issues of race and gender—interwoven and contextualized through coding problems. Through programs like these, those who are under-informed in engineering and computer science due to lack of opportunity or lack of representation are provided an avenue to become better informed and share knowledge in a digital and human context. This particular example highlights the issue of gender representation in STEM, an issue that is less prevalent in the humanities. According to the Academy of Arts and Sciences,[28] 60% of all bachelor's degrees in Humanities were earned by women whereas 19% of engineering bachelor's degrees were earned by women. Conversely, the lack of men in some fields such as elementary education might negatively impact the pay and prestige associated with those fields due to sexist cultural stereotyping.[29] This gender imbalance is therefore problematic across disciplines.

Digital technologies have also been invaluable in the humanistic endeavor to reclaim Indigenous knowledge. For example, the Myaamia Center at Miami University, which seeks to strengthen the Myaamia Nation "through the revitalization of our distinct ways of knowing, speaking, and being", has employed digital technologies to preserve their cultural heritage. The Center aims to conduct research with the explicit goal of giving access to tribal knowledge as a way of perpetuating knowledge both to members of the Myaamia community and to students at Miami University. Although this has entailed several projects, the major initiative of the Center has been language reclamation: the process of reconstructing the Myaamia language for practical use among the community. This is not merely the work of Myaamia linguists, rather, the project employed computer engineers to develop the database and corresponding learning apps, which launched in July 2019.[30] The Center houses the *Breath of Life* project, which is a digital database of linguistic research focused on reclaiming over 55 Indigenous languages. For many Indigenous communities, reclaiming their languages is an important step toward preserving their histories and cultural identities, and the United Nations recognized the significance of this process when it

[27] "Project Gallery," Girls Who Code, https://hq.girlswhocode.com/project-gallery.

[28] "Humanities Indicators," American Academy of Arts and Sciences, https://www.amacad.org/humanities-indicators.

[29] Motoko Rich, "Why Don't More Men Go Into Teaching?" *The New York Times*, September 6, 2014, https://www.nytimes.com/2014/09/07/sunday-review/why-dont-more-men-go-into-teaching.html.

[30] Margo Kissell, "Miami Engineering and Computing Students Collaborate with Myaamia Center to Develop Digital Archives," Miami University, May 19, 2019. https://www.miamioh.edu/news/top-stories/2019/05/myaamia-center-and-engineering.html.

declared 2019 to be the International Year of Indigenous Languages.[31] For language reclamation, accessibility and ease-of-use are key, as the goal is to reach members of the community so that the community's history can be preserved by revitalizing a once "silent language" into everyday use. Now the Center is focused on reclaiming Myaamia stories: "Stories are the means by which we continue to tell our family and community narratives," said Myaamia Center director Daryl Baldwin, "This project fills a significant gap in the historical narrative of displacement and survival." Using GIS mapping, the project also shows the loss of tribal lands throughout the 19th and 20th centuries.[32] In summary, digital humanities offer an important opportunity to bridge divides both between disciplines themselves and between academia and other publics. This bridge will be increasingly important as the world is faced with a variety of wicked problems such as global climate change, pandemics, and social injustice that require complex, interdisciplinary, and globally collaborative solutions.[33] Driving interdisciplinary collaboration and helping academia be understood as part of larger publics are just the beginning, however. Digital humanities can play a vital role in revealing the agency that emerges through the community-building process, and it is to that role which we turn next.

[31] Mary Annette Pember, "The 'Thing That Thinks Fast' Is a New Way to Teach Indigenous Languages," *Indian Country Today*, July 29, 2019. https://indiancountrytoday.com/news/-the-thing-that-thinks-fast-is--a-new-way-to-teach-indigenous--languages.

[32] Kissell.

[33] Horst W.J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences* 4, (1973). https://doi.org/10.1007/BF01405730.

# CONTEXTUALIZING AGENCY BY DECENTERING HUMAN INTERESTS

What room is there in the humanities to consider the non-human? When one hears the term "digital humanities," one might see it as two separate concepts: digital tools and humanities disciplines. As a compound term though, perhaps computation and human expression should no longer live as false dichotomies and humanity should reconsider its place in an ecosystem of processes and things. When considering human relationships with their technologies, we might consider the generative possibilities of the technologies we are making. When we move past the assumption that our technologies are tools we utilize for our own means, then it becomes harder to ignore the agency they might have and the effects of that agency on human society. Collectively, these effects have been demonstrated by the authors through the lens of history, big data, literature, and mathematics.

Historians have long preferenced the human as the primary agent of change. Some have looked at individuals making free choices that shaped the past, others have looked at cultural constructs that determine patterns of behavior—either extreme centralizes the human in the chain of cause and effect. The environmentalist movement picked up on this trend by presenting the relationship between humankind and the environment as oppositional, implying that human behavior is not only inherently destructive but by emphasizing that human behavior rather than environmental factors primarily drive unfolding events. Environmental historians, on the other hand, have upended this assumption by analyzing how environments, ecosystems, and even animals have both presented and limited choices for both individuals and societies. Do we alter our environment through collective human action, or are we limited by environmental determinism? Environmental historian William Cronon argued both: "in studying environmental change, it is best to assume that most human activities have environmental consequences, and that change in natural systems (whether induced by humans or by nature itself) almost inevitably affects human beings."[34]

Cronon also pointed out that the environment, much like our own cultures, is ever-changing, making it incredibly difficult to understand the historical relationship between the environment and human decision-making. While this has been a pressing philosophical problem for environmental historians, it can also put public historians into a difficult bind: how do you remake historical space when the physical ecology of the space has changed? In many ways, visiting a historical site invokes the imagination, allowing the visitor to imagine what the past might have been like.[35] This could also inspire the visitor to consider how environmental factors might have affected decision making: while we may think of beach resorts and retirement communities, how might an indigenous Floridian or early Spanish explorer of the sixteenth century have behaved differently than we might have based on environmental realities? How can technology help "place" the public within the natural environment of history?

Emerging technologies such as augmented reality or virtual reality offer limitless possibilities for remaking the ecological landscapes of historical sites.

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[34] William Cronon, "The Uses of Environmental History," *Environmental History Review* 17, no. 3 (1993): 13.

[35] Cronon.

Take, for example, Battle Road, which British troops marched along from Boston to colonial Lexington and Concord (and then fled back again). Today, part of that road has been preserved by the National Parks Service, but Minute Man National Historical Park is mostly forested. In the eighteenth century, much more of the landscape that is now wooded was farmed—the forests of today's Concord did not return until the end of the 19th and early 20th-centuries.[36] This gives visitors a somewhat flawed image of how the famed battles may have taken place, but technology allows us to superimpose a historical environment onto the real-world setting. Another problem is noise pollution: surrounded by busy roads, a major highway, and Hanscom Airfield, Minute Man Park certainly does not sound like the 18th century. While current technology focuses on augmenting visuals, sound is a new frontier for creating digital settings.

Essentially, we can see humans as evolving by colliding with, shifting, and morphing into their environment: natural, social, technological, and so forth. Humans develop profound relationships with their environment and the objects therein. For instance, N. Katherine Hayles describes the heavily mediated environment of the currency exchange broker by highlighting how the brokers do not view the currency exchange market as abstract at all. She quotes one trader who calls the market "a lifeform that has being in its own right ... it has form and meaning as a greater being".[37] Hayles cites others who describe trading on the market as similar to sexual and physical vulnerabilities or violent bodily penetration. In the digitally mediated environment of the 21st-century, it can be challenging to reframe our relationship with technology as deeply foundational to our species. By taking up evolutionary requirements of tool use as primary to language development, Mark Coté highlights how deeply connected human bodies are to the technologies they adopt and develop. Stone tool use led to an upright stance, which eventually allowed for the development of a larger brain capable of language. When considering the fundamental relationship between human subjects and their techno-objects, Mark Coté argues that media and technology are not foreign, external objects. Building on Bernard Steigler, Coté posits that, "sensory perception is only ever calibrated in relation to technics"[38] in a way that we cannot understand media or technology by thinking about them but by feeling them. In this sense, humans do not use technology and media to accomplish a task. Instead, humans and their technologies interface with and overlap one another, thus coevolving through exploring the shifting and fluid boundaries between them.[39]

This overlap is one of the themes in the project *Becoming Data*, by co-author J.J. Sylvia IV. This project is an augmented reality experience, designed with student collaborators and supported by grants. It was built using a Microsoft Kinect and the Processing programming language, allowing anyone to interact with a simulation that demonstrates how one's data may be used by several different organizations. When users interact with the program it appears as if it is scanning the user and collecting information about them. It then presents a series of randomly generated results that nevertheless demonstrate actual ways that real data might be used to make predictions. However, it is not immediately clear to the user that this process is fake, raising questions about concerns for one's privacy and whether or not such

[36] Howard S. Russell, *A Long, Deep Furrow: Three Centuries of Farming in New England*, abridged (Hanover: University Press of New England, 1982). https://www.nps.gov/articles/000/forests-at-minute-man-nhp.htm.

[37] N. Katherine, Hayles. *Electronic Literature: New Horizons for the Literary* (Notre Dame: University of Notre Dame Press, 2008), 98.

[38] Mark Coté, "Technics and the human sensorium: Rethinking media theory through the body," *Theory & Event* 13, no. 14 (2010). muse.jhu.edu/article/407142.

[39] This paragraph repurposes portions of Takehana's book *The Baroque Technotext: Literature in a Digital Mediascape,* pp.2, 152.

data is actually used in this way. It was designed to serve as a response to two obstacles that arise when discussing data ethics and privacy, 1) being relatively unconcerned due to difficulty understanding concrete applications of abstract big data and 2) the conceit that "if I haven't done anything wrong, I don't have anything to worry about." The augmented experience demonstrates how each person can be impacted, whether or not they have done anything "wrong." The use of augmented reality offers a method for demonstrating how the biological of the human overlaps with the technological of big data. In developing a more complex understanding of this overlap, participants see (through augmentation) how they are affected by the institutions that collect and utilize this data. It offers a way of visualizing space that includes elements which would otherwise be unobservable.

Thinking about our technologies as integral to our species and ourselves as part of an incredibly complex set of systems (as well as not part of many other systems) offers up an opportunity to reflect on the myths and assumptions we've developed about what it means to be human in a non-human-centric world. We certainly feel the weight of that responsibility in the anthropocene and our role in what could be a sixth mass extinction event. This could call for a radical empathy that pushes us to look beyond seeing as a human does, but thinking about what needs and priorities other entities might have, whether that be animal, plant, or environment, and how our needs might be in conflict with theirs. While it is well established in the rhetorical literature that empathy, or as Aristotle conceived of the emotion, *eleos*, forms the basis of existing with others, Lisa Blankenship's review of the development of the term certainly helps define the trajectory of the term towards increased inclusion of the "other." For Aristotle, *eleos* aligned more with a sense of pity and provoked individuals to act, not from a sense of shared suffering, but self-preservation, guilt, or fear. However, later philosophers saw empathy differently like David Hume who imagined it as a sense of emotional attachment one experiences to varying degrees depending on the closeness of one's relationship to other entities. For Susan Keen in her *Empathy and the Novel*, "empathy seems so basic a human trait that lacking it can be seen as a sign of inhumanity."[40] Ultimately, for Blankenship, empathy's "ability to transform ideas into something more real and epistemologically relevant" makes it a powerful force.[41] In a globalized world entwined with the Internet of Things, it could mean that Hume's concentric circles of moral reasoning could very well reach not just beyond humans, but beyond the biological. This raises a question about the meaning of the term "humanities." How much of that term is defined by focusing on the cultural and expressive agency of human beings as it might be more traditionally defined? How much might it reflect our aspirations of what it could mean to be humane?

Expanding notions of cultural and expressive agency of humans overlap with other scholarly areas that have worked to expand the notion of what is meant by the field of humanities. Scholars such as Rosi Bradotti see this expansion as a reason to explore a turn toward the posthuman and, relatedly, the posthumanities. The posthuman approach expands the understanding of what we define

[40] Quoted in Lisa Blankenship, "A Brief History of Empathy," *Changing the Subject: A Theory of Rhetorical Empathy.* (Louisville: University of Colorado Press, 2019), 38.

[41] Blankenship, 44.

as "human" and envisions knowledge as limited to the particular position of each individual knower, though mediated by technological assistance. This decentering of the human is similar to approaches to agency embraced by the digital humanities. Braidotti argues that "My monistic philosophy of becomings rests on the idea that matter, including the specific slice of matter that is human embodiment, is intelligent and self-organizing. This means that matter is not dialectically opposed to culture, nor to technological mediation, but continuous with them."[42] From this perspective, there is no essential "human nature" underlying all of humanity, but rather the "human" is but one lens through which to view the assemblage of matter. We each are created through processes of subjectivation that shape us, and importantly, technology plays a role in these processes. What it means to be human changes in part based on the technologies we use in our day-to-day lives, which impact the ways that we can make sense of the world around us. The age of big data and the Internet of Things (IoT) have demonstrated that organic species and technological artifacts now think alongside and with one another, creating what N. Katherine Hayles calls the cognitive nonconscious.[43] Braidotti argues that the digital humanities is best situated to explore, study, and extend these concepts, moving beyond the humanities to include these new forms of thinking that move beyond the human.[44] What might this look like in practice?

## II
**The age of big data and the Internet of Things (IoT) have demonstrated that organic species and technological artifacts now think alongside and with one another**
## II

Returning to the human-technology relationship in particular, several dangerous assumptions exist and are propagated in our cultural texts that perpetuate the idea that technologies are detrimental to the human species (nearly every sci-fi film you have seen), that they are easily developed/deployed/destroyed (COVID-19 vaccine in weeks or months), that they do not have a deep infrastructure (the cloud), or that they, as a kind of extension of the sciences, destroy the magic and mystery of story, beauty, etc. It is a strange position for a humanist to be in, to work against these myths and assumptions and instead look at how our technologies are us. While many are comfortable using metaphors to explain the machine in human terms, still more are uncomfortable with seeing the humanity in algorithmic terms, even if an algorithm is as much a human expression as a poem.

Strangely enough, we often think of our humanness as best defined by our idiosyncrasies. This could be why we feel slighted when Mark Quinn creates portraits by collecting DNA from each subject and placing it on framed agar jelly plates. Regarding humanity through its underlying material and basic processes reads as inhuman, insensitive, inflexible—too calculated, too algorithmic. But humans are not just fleshy, unpredictable, emotional creatures. We not only are a result of systematic processes; we invent abstract, logical processes that augment our understanding of our environment and those are part of our humanness.

Flagging human expressions that don't seem particularly expressive because of their seemingly mechanical or inhuman nature helps the humans who create them absolve themselves of culpability when their design or execution turns out to be negative. Perhaps here is where the work of code studies—a humanities style close reading of the backend of technological texts—becomes helpful. How a program

[42] Rosi Braidotti. *The Posthuman* (Medford: Polity Press, 2013), 35.

[43] N. Katherine Hayles, *Unthought: The Power of the Cognitive Nonconscious* (Chicago: The University of Chicago Press, 2017).

[44] Braidotti, Rosi. *Posthuman Knowledge.* (Medford, MA: Polity, 2019).

is coded is textually significant, deeply structural, and worthy of careful consideration of its ethical, cultural, social, political, even expressive impact. For scholars looking at digital texts—whether those texts are meant to be read as expressive like poetry or functional like an operating system—looking only at the display or output of code equates to a screen deep analysis. For Mark Marino, the emphasis on the executable function of code—does it do what it should invisibly in the background—is to ignore several analytical registers from which humans can understand the meaning of digital texts and disinvest humans from the impact of the code they create or use. Essentially, Marino argues that "[t]his emphasis on functionality neglects the meaning that code bears for its human audience. For code, especially mid- to high--level languages, exists not solely for computers, which could operate on machine language (essentially, representations of electronic signals), but for programmers as well."[45] Humans read code and even for those who can't, they are certainly affected by the coding they encounter in their daily lives and because of that impact, Critical Code Studies essentially argues that one can read and explicate code as one does literature.

However, one can flip the dynamic here and instead of applying humanities methodologies to the study of code, one could use computational methods on human texts. Computational analysis of writing makes us slow down and reflect on our logic. In literary study, we see this with close and distant reading. There is more than what exists to the human eye and our expressions become predictable or formulaic when viewed algorithmically. For instance, in *Enumerations*, Andrew Piper reveals how characters in literary fiction are so similar that they become generalizations rather than individuals. Other nominal entities show more differentiation in word usage than human characters.[46] An even deeper dig at our assumptions of individual style is that stylometry reveals that it is not what rare or unusual diction patterns a writer applies that distinguishes his or her style. Instead, the more reliable fingerprint is how and at what rate a writer uses function words like "the" and "of." These unconsciously used and semantically poor words reveal an author's voice, at least in quantitative terms. Such seeming contradictions between what statistical study of language and the expressive experience and identity of authorship are the core irritant that brings Takehana to her recent interest in stylometry. In her current project, *Nice Outsides/Suicide Notes*, she is working to reassemble anglophone authors' suicide notes into anagrams that mimic the authors' style so closely as to trick current author attribution techniques. Takehana is invested in making the project more than a kind of parlor trick and into an examination of lesser know stylistic trends of the authors included in the project as well as a reflection on how author attribution algorithms weigh characteristics in that writing and so, in the process, learn more about how humans and algorithms read textual material differently. Even the divide between human sentiment or experience and quantitative study will hopefully expand as the project continues. Rising suicide rates in the U.S., itself, is its own depressing quantitative pattern, has not necessarily improved the culture around

[45] Mark Marino, "Critical Code Studies," *Electronic Book Review*, 4 Dec. 2006. https://electronicbookreview.com/essay/critical-code-studies/

[46] Andrew Piper, *Enumerations: Data and Literary Studies* (Chicago: The University of Chicago Press, 2018).

mental health or lent voices to the experience of suicidal ideation, surviving suicide attempts, or living with the impact of others' suicide.

The evident need to reexamine humanness in light of algorithmically functioning machines is perhaps acutely pronounced in the creation of literature. The Canadian poet, Christian Bök, claims the future of poetry might not be in expressing human subjectivity but in creating poems that work 'by exploiting unthinking machines, by colonizing unfamiliar lexicons, or by simulating unliterary art forms,'[47] hence his *Xenotext* project to encode poetry in bacterial DNA. Oscar Swartz's *Bot or Not* also challenges our understanding of human authorship by using machine learning to write humanlike expressions and then applying the Turing test[48] to the products of poetry generators. We must then consider if we can have an expressive experience or emotional relationship with a poem generated by an algorithm. Even more, perhaps our human expressions are as predictable and easily isolated as Jodie Archer and Matthew Jockers have uncovered in their formula for a bestselling novel.[49]

Even beyond the literary world, we see increased homogenization in our online communities and searches due to nearest neighbor algorithms. But, in essence, these algorithms lay bare the herd mentality of humanity itself, because they were written by humans to understand our perception. Even the potential origin of nearest neighbor algorithms in Alhacen's *Theory of Visual Perception* began as an exploration of how humans see. So seeing through a human lens is also seeing through numbers. For humanities scholars "seeing through numbers" can challenge our understanding of what constitutes a public because big data studies that rely on statistical aggregates create publics that exist by methodology but not in the cultures studied.[50] Aggregate data coaches community members to think of themselves in relation to that data that ultimately "create and reinforce the idea of a measurable aggregate public"[51] and, depending on the methodologies and interpretation of data, one might make undue assumptions of how true or representative data even is. In quantitative methods, some data points might count less than others in life and thus factor less in modeling the data, perpetuating unequal representation. The gap between the quantitative literacy of humanists and the granular knowledge of humanistic data that mathematicians or programmers may have is precisely the gap digital humanists should concern themselves with in the age of big data. For example, many studies use data from Twitter because it can so easily be accessed and analyzed, but this leaves out all those who cannot or choose not to use such services. Further, the data and algorithms themselves are often problematic. Such problems are begging to be surfaced through work such as Safiya Noble's A*lgorithms of Oppression*, Andrew Ferguson's *The Rise of Big Data Policing*, and Cathy O'Neil's *Weapons of Math Destruction*.

Another side to the interplay of algorithms and humanity does not so much illuminate the herd mentality of humanity but recognizes the inherent fault and bias in humans allowing an acceptance of the neutral output of algorithms.  There is very little pushback against algorithmic approaches in the sciences (data science, stats, mathematics, biomath), which stands in stark contrast to the critique of such approaches in the humanities and social sciences. However, incorporating topics

47 Stephen Voyce, "The Xenotext Experiment: An Interview with Christian Bök," *Postmodern Culture* 17, no. 2 (2007).

48 This rudimentary test of artificial intelligence, first called the imitation game by its namesake, Alan Turing, uses human judges to determine if their mystery interlocutor is human based on their conversation.

49 Jodie Archer and Matthew Jockers, *The Bestseller Code: Anatomy of the Blockbuster Novel* (New York: St. Martin's Press, 2016).

50 Benjamin Mangrum, "Aggregation, Public Criticism, and the History of Reading Big Data," *PMLA* 133, no. 5 (2018): 1209.

51 Mangrum, 1214.

of social justice, cultural studies, and politics into mathematics and other STEM courses has increased over the past few years. The analysis of computational or statistics studies through the lenses of race, gender, disability is growing as part of STEM curriculum. It is another example of the intersection of digital humanities which does not require the STEM practitioner to be an expert in the historical significance of a court decision nor whether the ethical dilemma is one of a utilitarian or virtue in nature. However, the input and partnership with these disciplines to provide context is welcomed and strengthens the impact of the exercise, even if some mathematicians and scientists do not see it as necessary. Some computational examples used include drawing congressional districts. While a computer program can be written to do this, what should the parameters be? What are the parameters by law? What are the parameters morally?  Ethically? Another would be voting schemes. What is fair?  Why is it fair? Who does it benefit?

These examples closely tie into the inclusion of philosophy and ethics in mathematics.  This is a newer field and is slowly developing. Here we might talk about algorithms used for modeling. A person could be modeling disease spread (HIV, covid, ebola, "fake news"), resource distribution (policing, food), costs (building roads or pipelines), crime (predictive policing, recording crime data, incarceration trends), etc. These topics often exist without discussion of the human impact; however, the ethics in mathematics movement, a growing partnership between philosophers, educators, mathematics, and STEM-adjacent folk, suggests they cannot and should not be studied without ethical and human consideration for three main reasons. First, ignoring these contexts perpetuates systemic injustices in our society.  Second, the public may and really should believe that the human aspect was included in these models and with intentionality. Last, denying the connection allows the continued siloing of STEM students and academia and prevents the necessary cultural shift in mathematics to grow to support creators and users of mathematics.

Big data, the IoT, and algorithms are at the forefront of developments in news ways of sensing, seeing, and understanding the world around us. While the sciences have largely used these tools uncritically, the humanities have likewise criticized their uses without thinking affirmatively about how such approaches can and should be used to extend the capabilities of "human" thinking. Bridging these ways of thinking offers an opportunity to broaden the perspective on the historical dichotomy between the biological "human" and the technological "non-human." A deeper understanding of the mathematical models and algorithms guided by the critiques of the digital humanities offers a chance to move beyond such limited and dichotomous thinking, instead affirmatively embracing new ways of seeing and thinking about, and with the world.

II
Bridging these ways of thinking offers an opportunity to broaden the perspective on the historical dichotomy between the biological "human" and the technological "non-human."
II

# CONCLUSION

In a post-pandemic world where technology has reshaped our relationships and cultural practices, "business as usual" cannot keep pace. In many ways, modeling "new normals" in 2020 has become saturated with speculation. If nothing else, the pandemic has shown us all how interconnected and dependent we are on the actions of others. Further still, the logistics, methods, and practices of any one institution can have unpredictable and unprecedented effects on seemingly uninvolved groups. As has been the case with other moments of revolution or crisis, our current moment on the precipice of such wicked problems as the climate crisis or post-truth ideologies make many of our organizing structures alarmingly fluid. These tremors aren't only felt on a global or even large scale, but appear in individual disciplines, even individual lives. Now is the time for both vigilance and innovation, which is a challenging combination that the digital humanities is well-suited to address.

During this time, we have a collective responsibility to communicate across these eroding barriers and recognize how our work in one field is not confined to a public but resonates with many. For each of us, this means a different outreach and impact to collaborators born out of a wider ecosystem than we may have thought ourselves a part of. For Takehana, that has meant that literary study stands to gain insights by reaching out to linguists, mathematicians, and computer scientists whose methods could help generalize findings and make more transparent the methodological choices literary scholars make. Such insights could confirm what hermeneutics supposes but could help with persistent problems such as scholarly inclusion of lesser-known texts beyond the canon or overcoming the myth of original genius. For Wachtel, it has meant bringing history to new audiences on alternative platforms where they engage in the 21st century, but this involves broader multi-disciplinary collaboration with programmers, artists, and even the environment itself. Interest in history remains high, but as audiences turn to new modes of engagement, so too can the academic history. For Sylvia, this has meant opening a conversation between the computer scientists creating new tools and technologies and the critical theorists who worry about how those new tools will be used by third parties for things like surveillance and control. These often abstract issues are then reoriented for a third audience, the every-day public, using technological tools to make the abstract concrete, while also creating space for civic dialogue and engagement about these pressing concerns. For Buell, it has meant engaging STEM scholars in programs around philosophy, ethics, art, social justice, and humanity. Using computational tools within these disciplines invites both participants from humanities to influence and inform the conversations and participants in STEM to recognize the necessity of inclusion of these ideas into algorithms, teaching, studying, and research. Hopefully both see themselves as a necessary entity and less as being one or the other coming to the table.

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It is certainly difficult to collaborate with groups of diverse backgrounds and experiences. We must take on the novice role when we are habituated to being experts. Some of our questions can only be answered by working with people whose methods seem foreign and who speak wholly different disciplinary languages. But that challenge is now unavoidable. Ultimately, we need to listen more carefully and intentionally in ways that expand outside of our filter bubbles. This might mean purposefully curating one's social media feed to include different perspectives or creating the space and time for dialogue about important issues. Or, it might mean intentionally creating opportunities to collaborate with students, community members, and colleagues working in very different disciplines. Breaking down these barriers will require becoming more aware of the multiple publics in which we exist and developing an understanding of the multiple ways that we can contribute to and participate in those publics.

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