Introduction

EACH DAY, 2.5 quintillion bytes of data are created. More than 3.7 billion people surf the internet. Sixteen million text messages are sent per minute. Each day, 4.7 trillion photos are stored in the cloud.[1] The deluge of both digitized and born-digital materials is simply unceasing.[2] Full-scale digital repositories allow you to not only access documents on demand but also annotate, analyze, combine, and remix them into new forms of scholarship. Catalogs and search engines assist in uncovering resources. The computer and its associated software can make organizing and producing research more efficient than was previously possible. In parallel, major archives, libraries, and governments have conducted sweeping digitization programs to provide access to their archives, holdings, and analog records.[3] As a result, the opportunities to develop digital history research agendas and teaching pedagogies are flourishing. That flourishing can feel like an overwhelming tide as digital technologies encompass and expand the cultural record. From the digitization of analog physical materials, to the recovery of materials stored on early media formats like floppy disks, to the harvesting of web and social media platforms, historians of the future will certainly have to confront digital sources and the internet when they analyze the past. Professional historians are not alone in engaging with digital technologies and tools. Digital history can put

the tools of knowledge creation in the hands of communities so that they can articulate and explore their own histories. One of those communities is our students who are eager to embrace the possibilities of their own history in digital forms. This book serves to assist you in thinking through how the history classroom can serve as a site of knowledge production with and about digital technologies, tools, and approaches.

Depending on which methods and historiographies one elects to draw on, what is digital history and what is possible with digital history methods can vary.[4] Some scholars are attracted to new forms of scholarly publishing, such as websites, podcasts, and multimodal storytelling, and might tie their digital history definition to methods from journalism, new media, and communications. Others are intrigued by the possibilities available through massive digital archives, exhibits, and collections and might define digital history through the lens of digital libraries, archives, and information science. Still more options include statistical models and high-performance computing, which provide a pathway to crunch massive datasets in order to explore humans and their experiences at ever greater scales. These historians may define digital history as intricately tied to computer science, statistics, and mathematics. There are even historians who have embraced digital history to build elaborate video games and digital reproductions that allow us to "play the past."[5] They might define digital history through new media, art, and modeling. Cultural historians Petri Paju, Mila Oiva, and Mats Fridlund define digital history as encompassing "diverse historical practices, such as digitization efforts at archives, libraries and museums, computer-assisted research, web-based teaching and professional and public dissemination of historical knowledge, as well as research on the history of 'the digital,' computers and digital technologies."[6] Hannu Salmi offers a definition of digital history as "an approach to examining and representing the past; it uses new communication technologies and media applications and experiments with computational methods for the analysis, production, and dissemination of historical scholarship."[7] As digital historian Jo Guldi reminds us, "digital history is not so much a field or sub-field . . . as a universal approach to history."[8] For Guldi, digital history is not singular so much as digital histories that

are "informed by exchanges, building on works already in progress across the land."[9] This is why most digital history also engages with fields outside history and with the digital humanities generally.

What digital history is and how it is practiced is defined by your historical interests, the audiences you seek to reach, and how you wish to communicate with those audiences. For this reason, digital history definitions are multipart and often demarcate the "how" and "for whom" as much as what digital history is. Digital public historian Sheila Brennan, for example, defines digital history as

> an approach to researching and interpreting the past that relies on computer and communication technologies to help gather, quantify, interpret, and share historical materials and narratives. It empowers individuals and organizations to be active participants in preserving and telling stories from the past, and it unlocks patterns embedded across diverse bodies of sources. Making technology an integral component of the historian's craft opens new ways of analyzing patterns in data and offers means to visualize those patterns, thereby enriching historical research. Moreover, digital history offers multiple pathways for historians to collaborate, publish, and share their work with a wide variety of audiences. Perhaps most important, digital methods help us to access and share marginalized or silenced voices and to incorporate them into our work in ways not possible in print or the space of an exhibition gallery.[10]

How you define digital history is directly impacted by the historical questions and contexts you seek to understand and the audiences you hope to reach. This book will provide overviews of how differing historians articulate and enact their own digital history definitions through classroom pedagogy. Digital history remains tied to the fundamentals of historical scholarship, evidence, and argument, and the historians and projects selected for inclusion in this book represent the variety of approaches to teaching and engaging with digital history. They ask similar questions in the digital space that we do in the analog, but they also represent the questions about access, audience, output, and privacy that you must grapple

with as you work with digital technologies and their capabilities. These questions often highlight digital technologies' problematic roots, whether by interrogating power and audience, the ways in which digital technologies enable certain types of historical thinking, or their ties to issues of privacy, data, and security.

Digital history has a long trajectory within the historical discipline. Quantitative history has long leveraged statistical analysis and modeling to allow social and economic historians to create massive databases of historical records.[11] Harriet and Frank Owsley, Merle Curti, William O. Aydelotte, and others in the 1940s and 1950s transformed manuscript records into quantitative data that could be tabulated and sorted via IBM-owned Hollerith machines. This enabled them to provide sophisticated analyses of employment and immigration patterns and of other aggregated trends over time. Economic historians and historians of American slavery spent years enmeshed in a debate over the validity of computational methods for historical scholarship after the publication of the 1974 work *Time on the Cross: The Economics of American Negro Slavery* by Robert Fogel and Stanley Engerman.[12] Digital public history is now almost three decades old. Edward Ayers's award-winning website The Valley of the Shadow, published in 1993, introduced audiences to a digital archive of primary sources drawn from Augusta County, Virginia, and Franklin County, Pennsylvania, during the American Civil War (1861–65). The work of Ayers, William G. Thomas III, Anne Sarah Rubin, Andrew Torget, and others working on the Valley project encouraged generations of historians to consider digitization and hypertext, which allows you to link documents to one another, as an opportunity to reach new audiences.[13] So too did the digital history work facilitated by the American Social History Project, which produced scores of digitized, annotated, and analyzed primary and secondary sources as part of its work in the 1990s on the website History Matters: The U.S. Survey Course on the Web.[14] It hasn't just been scholars employed as full-time historians that have grounded digital history in research and teaching. Much of digital history was created, and continues to be authored by, the archivists, librarians, museum educators, and other cultural heritage professionals who embraced the possibil-

ities of technology for telling stories of the past. Historians rely on their expertise and join them in crafting narratives for specialists and the public alike that highlight the wide variety of possibilities enabled by computers, tablets, smartphones, programming languages, and digital software. They have also been joined by computer programmers, user experience designers, informaticists, and even engineers who contribute to building technologies, providing methods, and challenging how historians conceptualize history and its many varied types of evidence and argument.

The primary connection between analog and digital that grounds this book is the belief that what makes it into our histories is a statement of our values and positions as individuals and as historians. For me, this is an antiracist, feminist, decolonial practice that implements practices from social justice and disability justice, which recognize that selection, bias, issues of institutional support, access to resources and materials, problems of racial hierarchies, the embrace of capitalism, and the consequences of colonialism have long affected and been central in the discipline of history. Digital technologies amplify these concerns. Choosing to use tools like the global positioning system (GPS) ties users to their roots: such devices, created by the military, furthered nation-building in the 1950s. From their inception in the early 2000s, social media tools like Facebook and Twitter have also been tied to surveillance and implicated in violence against colonized peoples. Decisions to create digital archival collections in the midst of the most recent round of anti-Black violence around the globe intersect with concerns about privacy, law, and oppression that analog historians face when they encounter documents of trauma and violence in the physical archive. Choices about appearance and clothing in digital historical re-creations intersect with questions of accuracy and appropriation. The systems of oppression and trauma that dominate the analog world have been amplified in the digital sphere, even as many pretend it is exceptional because anyone can use and post to the internet. These issues are of particular concern for underrepresented and marginalized communities who encounter systemic and highly personalized encounters with digital tools and technologies.[15] These are not US-centric or Europe-centric concerns, as the technologies that are

developed in the United States and Europe are often imported to other countries, particularly the global South.[16]

Beginning by highlighting the importance of the creation and analysis of digital archives about the transatlantic slave trade, historian Jennifer Hart argues that African countries and those who study African history face "persistent challenges to processing and preserving archival materials on the continent."[17] Celebrating the ability of digital technologies to bring "new voices and perspectives into the popular and scholarly conversations about the African past," Hart argues that digital history is yet another methodological practice embraced by Africanist scholars who seek to rethink historical practice. She writes, "By engaging in public scholarship, these digital history projects help re-think long-standing concerns among Africanist scholars about the politics of knowledge production and the repatriation of scholarly materials."[18] Elaborating on the links between collaborative projects that are often funded outside the African continent and the lack of resource investment in African countries, Hart cautions that digital history can replicate the extractive processes, biases of funding, and limitations of institution building where centers, institutes, and programs overwhelm concerns of representation, inclusion, and access. Digital history that operates outside of academic contexts is, according to Hart, a vibrant space that problematizes both how the field defines itself and how it is defined by others.

Digital history encourages treating software, platforms, and algorithms as sites of analysis themselves, to challenge these amplified threads. Whether you are encouraging students to explore the logic underlying a freely available tool or asking them to build a digital project from scratch, the thread running through all digital history is a wary eye on the word "digital" and its relationship to historical thinking. This is a necessity because digital history relies on parameters and objects established by nonhistorians. Racism, sexism, and corporate interests are embedded within internet search engines and their functionality just as they are encapsulated in analog archives.[19] Historical misinformation and shoddy citational practices proliferated before the advent of the internet, but the internet enables them to spread at a much more rapid rate and with

greater influence, as anyone can retweet, share, or republish. Anyone can say whatever they'd like, however they'd like, on the internet. With the mass digitization of cultural records, materials shared from underrepresented communities and the global South have been made more readily available to academics and their students. Sources divorced from the contexts of their production and the communities they represent are one of the most slippery slopes of digital history research. Students can easily find materials but often are ill-equipped to consider the ethics of their use. This is particularly keen for scholars and students situated in the global North who are disconnected from the scholars, communities, and cultural heritage institutions of the global South.[20] With collaborative digital technologies and partnerships, we can bridge that distance, but as teachers we must do so in a way that is honest to the needs of the communities we wish to engage with. As Indigenous scholar Linda Tuhiwai Smith reminds us, the needs of researchers do not necessarily align to the interests or needs of communities.[21] Digital technologies enable us to have virtual meetings, shared workspaces, and shared projects. One way of ameliorating the disconnect between the source base you hope to use and the community it originates from is through collaborative projects. Partnering with scholars, individual students, classes, and cultural heritage institutions is one way to bridge the disconnect between the positions of privilege many of us occupy and the communities we seek to understand.

It is important to consider as well the "digital divide," which is a blanket term used to refer to the uneven and unequal access to, or use of, digital technologies based on social, economic, geographical, geopolitical, or even cultural criteria. As this text is being written, the global coronavirus pandemic is actively reshaping teachers' sense of those extremes. When I talk with my colleagues about our students, it becomes clear that the problem isn't that students might not have computers or internet access. Instead, it is that their computers are too old, the software too slow, or the connection too poor to give them a consistent, high-quality engagement with virtual learning environments. One student, for example, shared with me that, as the oldest sibling in her family, she had to wait until her three siblings as well as her parents used the family's computer for school and

work before she could sign in to our class. The reality for many of our students is that their digital insecurity challenges their ability to contribute to our classes. It is our obligation as educators to recognize that instability and, wherever possible, accommodate students' needs. This may involve setting up loan programs for devices, creating low-bandwidth versions of course content, and providing alternative assignments that scale to the resources available to your students. If you are working within the contexts of communities in the global South, that could also mean recalibrating your projects to be developed on and work with low-bandwidth internet connections and cellphone screens.

Because much of the public gets its historical knowledge from the internet, there is a pressing need to understand how and where digital technologies and historical thinking meet. This book identifies that meeting ground by illustrating how digital history research can be both included in, and at the center of, our teaching practices. Digital history gives historians opportunities to engage in a timely manner. And, as importantly, it provides avenues and opportunities for individuals and communities to tell their own stories, with their own values, and for their own purposes. Audience then is a prime concern of digital history. In this book, the question of audience is woven throughout, including whom history is for, how we write for different audiences, and what obligations we, as historians, have to our audiences. Audience, you'll learn, requires attention not just to what we need as teachers and scholars but also to what our students and digital project users might need as well.

Regardless of how stellar they are or how much they struggle in our classes, students want to hear the histories of their communities. They want to know about their ancestors and how decisions by individuals, communities, and governments in the past shaped their present. While they might seek simple answers on tests, they are most intrigued by history's nuance and complexity. They like the challenge history offers. What decisions might they have made? How might their histories be added to the stories already being told? How might they challenge everything we know about a particular event, period, or interpretation? It is our privilege as teachers to help them seek out those narratives in all their complexities.

This book suggests that in a digital history classroom, the stories we want to tell can fundamentally interrogate not just what histories are told but also how we tell them and who has access to them. Student historians can narrate their own stories and also make them easily available to broader audiences through digital avenues.

At this point, you may be asking yourself whether I am going to prescribe how much of your class should be devoted to developing historical context for the students and how much should be driven by technologies. This book is not a prescriptive textbook that walks you step by step through teaching a digital history course. It does not provide hard and fast rules for the classroom. Instead, this book represents the possibilities enabled by using digital methods and forms of scholarship as they exist in history classrooms today. It highlights for you the variety of strategies and approaches that can lead to digital history outcomes. It shows small slices of digital history scholarship in any given chapter. This means there are ample opportunities for you to look at additional pedagogical examples. To enable this, I've incorporated citations and hyperlinks to digital methods, projects, and portfolios so that you can explore further on your own. I've also included a brief glossary of terms and digital projects at the end of the book to help you as you navigate each chapter.

As we move through the book, you'll be encouraged to make decisions for your course based on your own values, abilities, and course intent. Those decisions will also be shaped by the resources available to you. For that reason, in the glossary, I've indicated which software and tools are free so that it's clear which can be implemented without institutional support. I've also written each chapter to provide varying levels of technical expertise to your approaches for digital history methods and tools. The lines between an example from a collegiate classroom and a high school, or even middle school, classroom are much fuzzier than one might expect. Frequently, the technical capabilities of high school (and even middle school) students are not much less than that of college freshmen. I've seen middle school students building apps while my college students struggle with developing a multimedia-driven website and vice versa. Age has little to do with a student's technical abilities. In fact, one of the most pernicious

ideas is that those who are chronologically younger are somehow more technologically fluent than those who are older. You'll notice that, throughout the book, I identify what level a course operates at—middle and high school, college, and so on—along with descriptions of the digital history activities. But I also note how you might scale up or down the historical and technological complexity based on your students' abilities. Don't be afraid to try out any example in a class, regardless of a student's educational level; you'll often be able to nudge it toward a more or less complicated direction based on students' abilities. For that reason, I like to gauge where my students are at through a pre-class survey that asks them what they know how to use versus what they know how to build. I often repeat that survey at the close of class to measure their growth. This allows for customization of the course, so I meet students where they are at and then challenge them, rather than teaching toward either the most or least technologically able.

In large part, digital history is a set of opportunities granted through technical fluency where you'll be continually improving your abilities both as a teacher and as a learner. I like to explain to colleagues the fluency principle as follows: if you are a French historian, you can write histories of France and French-speaking peoples by using documents translated by others. It enables you to work with the sources and offer analyses, but you are limited by your lack of linguistic ability and by what documents others have selected to translate. But, if you are fluent in French, you suddenly have not only more opportunities to identify documents and analyze them yourself, but you can participate more fully in the scholarly community of Francophone studies than you could if you had to rely on translations only. Students and teachers in the digital history classroom are similar. The first time teaching a course, we are often nervous and frequently end up experimenting with different assignments, materials, and outcomes. Over time, as we teach the same subjects for years and mature as teachers, we become more comfortable and dig a little deeper into pedagogy. And, as more historians embrace digital history teaching, we'll see more opportunities to discuss, debate, and revise our teaching. This book recognizes that potentially long arc of digital history adoption and is built

to respond to a delayed trajectory. After all, it's rare that we as teachers have time to make rapid changes to our pedagogy. It can take weeks, months, and even years to fully revise assignments and syllabi. Similarly, in a digital history course, you may begin by experimenting with a given method using a readily available tool that doesn't require much underlying knowledge of its functions or customization. But as you master that method, it's likely that you'll desire more control and agency. This book recognizes that wish by providing at least one tool that can be used for any given method without having any additional expertise in programming, mathematics or statistical knowledge, or technical infrastructure. In addition, each chapter provides at least one example of using complicated digital history processes in the classroom that might require you to challenge yourself and your students. As historians, many of us are never truly satisfied with our courses, so revising them to move toward more control in the digital history classroom will feel familiar. STOP HERE! :)

To help demonstrate the varieties of digital history pedagogy available to you, the book is organized in three parts. In part I, we focus exclusively on digital history fundamentals and their relationship to analog historical practice in the classroom. Chapter 1 explores the role of data and the ways in which historical sources can be conceptualized as forms of information that help historians to ask a variety of types of questions. You learn basic terms and processes for identifying data, how to incorporate historical data literacy into your classroom, and how to scaffold data aggregation to align to methodological processes. Chapter 2 explores learning outcomes and a formula that I utilize to develop learning outcomes in the digital history classroom: history, methods, technology. It will help you think about how to balance historical thinking and its fluency with the selection of appropriate methods and tools. The chapter also encourages you to think about how explicit learning outcomes can help your students and colleagues understand how digital history operates similarly or differently from its analog counterparts. Chapter 3 provides a brief overview of three different types of assignment interventions that are possible in the digital history classroom once you have gathered your dataset and determined what learning outcomes you wish to incorporate. The unessay,