

# Experiencing Civil War History Through Augmented Reality: Soldiers, Civilians, and the Environment at Pamplin Historical Park

## A. NATURE OF REQUEST

We are designing an Augmented Reality application to enhance visitors' understanding of Civil War era history at the Pamplin Historical Park in Petersburg, Virginia. Pamplin HP contains four museums, three historic homes, and the Breakthrough Battlefield, site of the critical Union action on April 2, 1865 that led to the Confederate evacuation of Petersburg and Richmond--and subsequently to Union victory in the Civil War. The application will provide technologically innovative and engaging ways for park visitors of all ages to better understand humanities scholarship on several topics that are not always prominent in public history presentations of Civil War era history: environmental and military history; the war's impact on households and civilians, including enslaved African Americans; and the nature of historical sources and the construction and reconstruction of historical narratives over time.

A \$30,000 Discovery Grant will facilitate collaborative planning between (i) a project team with expertise in Civil War era history and/or experience using technology to visualize the past in new ways; (ii) Pamplin HP staff; and (iii) a distinguished group of humanities advisers from Civil War era history and education. This funding will allow us to consult with all collaborators as we develop plans to deliver humanities content using the most appropriate technologies and techniques. The final product of the discovery phase will be a detailed design document for the prototyping phase.

## B. HUMANITIES CONTENT

The application will educate public audiences in several significant humanities themes. These themes, none of them traditionally prominent in public presentations of Civil War era history, are informed by current scholarship in the fields of history and education.

### **Humanities theme 1: The natural environment shaped Civil War Americans' experiences and actions, and humans in turn sought to transform and manage the environment.**

A major goal of the application will be to situate the user in the environmental and military realities of warfare in the Petersburg trenches. The Richmond-Petersburg campaign saw increased use of continued operations and field fortifications, taxing exhausted and depleted field armies to their limits. While U.S. soldiers were better supplied, both sides suffered from the impacts of trench warfare on health, comfort, and morale. Environmental factors, such as weather, insects, and terrain, determined not only strategic and tactical decisions, but whether men sickened, died, or deserted. Since combat was intermittent during the prolonged siege at Petersburg, soldiers' daily priorities most often involved basic needs such as eating, drinking, excreting, and sleeping, all in the midst of grinding environmental realities. Denuded landscapes teemed with filth—human waste, animal bodies, and swarming flies—while rain threatened miserable flooding. Men longed for their chance for even 24 hours behind the lines for cooked meals, shade, and mental relief from the

torment of sharpshooters or potential assaults (Shively Meier 2015). Because Pamplin HP has some of the best preserved historical earthworks of the Civil War, the sensory experience of trench warfare can truly come alive here by bringing together environmental and military history.

The union of environmental and military history of the Civil War is relatively recent, having explicitly originated with historian Jack Temple Kirby's 2001 call to investigate disease, bodies, animals, farmland, forests, and manmade features. The environmental-military history of the Civil War has since evolved to analyze how humans transformed and managed the environment--whether as a natural enemy or ally--and conversely, how nature shaped participants' actions and institutions (Russell and Tucker 2004, Browning and Silver 2020).

Our project will allow visitors to visualize--and therefore to understand more deeply--the mutual influences between soldiers and the environment. We draw on studies of the war's environmental destruction via deforestation, bodily disfigurement, and the ruination of built environments (Brady 2012, Nelson 2012), and studies of the environment's impact on Civil War soldiers in such forms as insects, fouled water, and climate (Shively Meier 2013). We will also convey some of the specific environmental factors that influenced the development of the Breakthrough Battle on April 2, 1865, including the impact armies had already had on the landscape through deforestation, building earthworks, constructing corduroy roads, and digging latrines; the difficulties of navigating roads and waterways swollen by the heavy rains of the final three days of March (Noe 2020); and even the simple but consequential fact that much of the action took place before sunrise.

At Civil War museums, these topics are often overlooked. AR will enable an immersive experience that conveys up-to-date interpretations of key environmental topics to patrons of all ages.

**Humanities theme 2: Civil War households were sites of social transformations shaped by military events--and those transformations were experienced differently according to such factors as race, class, and gender.**

The Pamplin Historical Park presents the opportunity to explore not only a military site of critical importance, but also a place where diverse civilians continued to live their lives amid the realities of war. Part of our tour will take place on the grounds of Tudor Hall, which Pamplin already interprets as a plantation home and a military headquarters. This dual interpretation reflects the fact that Civil War Americans did not experience a neat divide between the categories of battlefield and homefront (Gallagher and Shively 2014, Foote 2017). Rather, civilians and soldiers moved fluidly between the two worlds, and military events and domestic transformations were intertwined.

Taking advantage of the proximity of Tudor Hall to the trenches and battleground, we will stress connections between domestic space, social change, and war. The Civil War profoundly disrupted household relations across the country, upending traditional power relationships including paternalism and white supremacy (Frank & White 2020). In plantation households like Tudor Hall, the pressures of war prompted renegotiations of power: between men and women; between enslaved African Americans and white property owners; and, due to the widespread absence of

men, between white women and black women. The plantation household was thus a place where larger conflicts along lines of gender and race took place on an intimate scale (Glymph 2008).

We will present the household as a place of social conflict and transformation through short AR video clips representing different individuals and groups who lived and worked at Tudor Hall. Represented voices will include owners Joseph and Ann Boisseau; enslaved men and women; and the officers headquartered in the home toward the end of the war. Although the lack of source material will make it impossible to ground all of this in the documented experience of specific individuals, we will draw on historical scholarship to describe general patterns. The AR format will facilitate a powerful sense of proximity to the actors--and therefore the historical people they represent--as well as adding interactivity. Visitors will come away understanding how the war transformed life at home, in very different ways according to factors such as race, class, gender, and geographical location.

**Humanities theme 3: The Civil War afforded both opportunities and hardships to enslaved African Americans--from volunteering for the U.S. military, to living in refugee camps, to negotiating new relationships with slaveholders.**

For generations African Americans were relegated to the margins of Civil War history. Now, historians not only emphasize slavery and its expansion as the cause of the war, but also center the experiences and agency of African Americans before, during, and after the conflict. There are many stories to be told here: stories of black men fighting for freedom in the Union military; stories of men and women who escaped slavery but confronted new challenges in refugee camps; stories of enslaved people forced to serve the Confederate war effort, or re-negotiating their relationships with slaveholders in plantation homes like Tudor Hall (Reidy 2019, Taylor 2018, Glymph 2020).

We will use the flexible storytelling capabilities of Augmented Reality to give public audiences insights into the range of African American experiences during the Civil War. We know the names of 66 individuals who were enslaved at Tudor Hall, and although details are scarce, we will use the evidence we do have to provide glimpses into their lives. For example, we will share the story of Marie, an enslaved cook for the Boisseau family who died aged in 1853 and who was likely replaced by a woman named Fanny whom Joseph Boisseau purchased shortly thereafter.

Users will also be able to engage with historical documents and to understand how documentary records reinforced the marginalization of African Americans. We will guide users through analysis of three key documents from Tudor Hall's history: a Boisseau family will from 1838; the 1860 slave schedule of the U.S. Census, in which Joseph Boisseau claimed ownership of 18 people; and an 1863 tax record that listed only 9 enslaved people. These documents convey the difficulties of researching enslaved people with limited evidence; the wide-ranging implications of defining people as property; and the opportunities for resistance and escape presented by war. The fluidity of the war allowed enslaved people to work toward new freedoms, including new names, marriage, education, paid jobs, and the hope of future citizenship and political rights via military service.

Looking further afield, we will use virtual tour guide videos to explore the experiences of black Union soldiers in the wider Petersburg Campaign, and the very different experiences of black men and women in refugee camps in other parts of Virginia, such as Arlington or the Fort Monroe area. Even where the stories are not tied directly to residents of Tudor Hall, delivering this content on the grounds of a former slave plantation will make it more powerful for visitors.

**Humanities theme 4: Critical analysis of historical sources in context generates deeper understanding of people who lived in the past.**

History as a discipline is based on the understanding that all sources--whether primary or secondary--are products of their time and place. Drawing on educational practices and theories, we aim to make historical thinking transparent by enabling visitors to engage with the sources themselves in a guided process. Augmented Reality is a particularly engaging way to show visitors the benefits of critically analyzing sources, because it allows users to interact with the documents and to see and hear historians' processes of interpretation at the same time.

This part of the project rests on the SCIM-C model of historical source analysis (Summarizing, Contextualizing, Inferring, Monitoring, and Corroborating; Hicks & Doolittle, 2008). Users will learn important lessons about how historians approach written sources and use them as evidence to make claims and advance interpretations. We will prioritize historical documents that feed into the first three humanities themes discussed above, for example a soldier's letter discussing the impact of the weather or the manipulation of the natural environment in constructing trenchworks; a letter home revealing linking social conflicts at home with life in camp.

Published sources are just as much constructed artifacts of their time as handwritten sources are. We will showcase James Fitz-James Caldwell's *History of a Brigade of South Carolinians*—a published account of McGowan's Brigade that Caldwell wrote while stationed at Tudor Hall in 1864-65—and probe the specific interpretations of Confederate military history that Caldwell advanced. Early military histories came to undergird the later "Lost Cause" ideology, which asserted the superiority of the Confederate cause and military performance, insisting that it succumbed to loss only because of inferior manpower and materiel (Gallagher and Nolan 2000). Learning about Caldwell's work will prompt users to reflect on the inherent biases of all historical narratives, and to appreciate the evolution of different interpretations of the Civil War over the long term.

**Resources**

The project will ultimately feature a wide range of audio, visual, and textual resources. Many of these already exist in their original historical form, some within the collections of Pamplin Historical Park, e.g. historical photographs and sketches; letters and diary entries from soldiers and civilians. We will also create new tailor-made resources for our application, such as audio recordings of historical source texts; video recordings of actors and virtual tour guides; digital artwork representing trenches and natural environmental features.

## Comparable projects

Our project builds on existing Augmented Reality and Virtual Reality explorations of Civil War era history. The American Battlefield Trust has recently released a Virtual Reality experience that immersively places users in Civil War military settings (<https://www.battlefields.org/learn/videos/civil-war-1864-virtual-reality-experience>). As a Virtual rather than an Augmented Reality experience this can be viewed anywhere, ideally using a VR headset, but even with a handheld device the immersive experience is captivating. The Trust is also in the process of developing an Augmented Reality application for use at Gettysburg (<https://www.battlefields.org/give/save-battlefields/help-bring-past-life>). Shenandoah University's McCormick Civil War Institute has produced similar applications, as well, such as a Virtual Reality re-creation of John Brown's Trial and an actor-centered Augmented Reality display of key moments in the Battle of Cool Springs (these experiences are available in person rather than online; see <https://www.su.edu/mcwi/>).

Existing applications provide valuable foundations and inspiration for our project, demonstrating significant public interest in using creative technologies to learn about Civil War era history and showcasing effective approaches to exploring this subject digitally. Inspired by these projects, we will leverage Augmented Reality technology to immerse users in the world of the 1860s. Our project, however, will innovate in several key ways:

(1) Our commitment to conveying the four humanities themes discussed above. Like most projects of this type, one of our goals is to place the user immersively in the past--allowing them, to some degree at least, to see what the 1860s looked like, to imagine what the 1860s might have felt like, and to understand the perspectives of people who lived through the Civil War. But for our project immersiveness is a means rather than an end--a means to educate our audiences about the interconnections between military and environmental histories; about the impacts the Civil War had on civilians; and about reading historical sources with a historian's eye.

(2) Interactive elements that incentivize active engagement by users of all ages, for example the opportunity for users to build earthworks digitally or to select questions to ask living historians. The American Battlefield Trust's VR experience is interactive in that it allows users to feel as though they are moving through space and to choose which direction to look in. Parts of our application will be interactive in a different way--more like an educational video game than an immersive cinematic experience.

(3) The centrality of historical source material, which we will guide users not only to read and/or listen to--but to actively and critically interpret themselves.

This project draws on the experience of several project team members with the NSF-funded "CI Spy" Augmented Reality application, a fifth-grade educational tool that allows students to engage in documents-based historical inquiries relating to an African-American school that operated between

1866 and 1966. Over 300 elementary students have used the application as part of the local history curriculum (Johnson et al., 2017). The tool has also been utilized by the school's alumni association.

Key lessons from CI-Spy that will inform the design of this project are (1) the importance of designing the application with a “sweet spot” level of guidance that fosters autonomous learning while providing necessary context and tools, (2) techniques for leveraging the importance of place in informal education, and (3) curating images and documents that are both engaging to users and successfully teach the intended humanities themes and skills.

### **C. PROJECT FORMAT**

The grant will fund creation of a detailed design document that develops the preliminary ideas in this section. The design document will be produced through off-site project team meetings; an on-site project team meeting; a second on-site meeting involving the project team and the humanities advisers; a final videoconference; and additional opportunities for feedback via email. Each stage will combine an iterative design process with expert guidance on the humanities themes.

Our ultimate goal is to create an Augmented Reality application that enhances Pamplin Historical Park visitors' understanding of Civil War-era history. The park already provides visitors with multiple ways to learn about different aspects of Civil War history, ranging from in-person guided tours of the Breakthrough Battlefield, to audio-player tours through the exhibits of the National Museum of the Civil War Soldier, to living historians who portray soldiers and civilians. Our application will build on existing strengths while adding versatile new opportunities to learn at one's own pace, using engaging technologies, even when an in-person guide or living historian is not available. It will aid understanding of the humanities themes discussed above by allowing users to visualize and to hear representations of the past in ways that are not currently possible.

In order to make the application widely accessible, we will design it for easy download onto visitors' own smartphones/tablets—both Apple and Android. We will also provide I-Pads (hopefully funded by a future grant) for school groups and others without their own devices.

Immersive technologies such as Augmented Reality are increasingly valued as positive learning environments for engaging with the past (Bower et al. 2014, Krevelen & Poelman 2010, Amakawa & Westin 2018). AR is particularly suited to the recovery of hidden histories, because it allows developers to restore people, topics, and material artifacts to landscapes from which they have historically been excluded (Amakawa and Westin, 2018; McMahon, 2019; King et al., 2014). We plan to purposefully use this technology to uncover hidden stories and marginalized people, capitalizing on the multi-perspectival storytelling format that AR facilitates. One scholar has explained that “AR enables a form of storytelling that is nonlinear and dispersed throughout space, in fragments of information sharing that situates our attention to people, places, and things in our immediate environments” (Tinnell quoted in McMahon et al., 2019). This technology will allow us

to present the diversity of Civil War history in one application that encompasses three specific sites and the voices and perspectives of soldiers and civilians, white and black people, women and men.

We plan to develop content for three sites within the Pamplin Historical Park, all heavily visited and all within a short walk of each other:

(1) On the ground where the critical “Breakthrough at Petersburg,” took place. At the end of a campaign lasting more than nine months, U.S. forces broke through Confederate lines on April 2, 1865. This U.S. victory was the beginning of the end of the Civil War, leading to the evacuation of Petersburg and Richmond and Robert E. Lee’s surrender a week later.

(2) Near one of the surviving trenches within the battleground. The Petersburg campaign generated an extraordinarily extensive system of fortifications, foreshadowing the “modern” trench warfare of the twentieth century. Pamplin HP contains well-preserved original trenches as well as a modern reconstruction.

(3) At Tudor Hall plantation house, including its reconstructed enslaved homes. Tudor Hall was built around 1812 and has been restored to its Civil War-era appearance. Confederate General Samuel McGowan used the house as his headquarters from October 1864 to March 1865.

**1. The battlefield site.** The main goal here is to enhance visitors’ understanding of how the natural and human-made environment shaped soldiers’ decisions and experiences during the April 2 battle (our humanities theme #1). Key components include:

- Digital recreations of the 1865 landscape with features such as trees, waterways, and earthworks. Graphics will also indicate troop placements and movements. Anyone who’s ever taken a battlefield tour will recognize the value of clear indicators, overlaid onto the real world, to visualize the location of troops and landscape features in order to understand the development of a battle. These features will not only immersively place users within the 1865 landscape; they will also promote understanding of the role of the environment and natural features in military events.
- A simulation exercise that allows users to play the role of a military commander on April 2, asking how they would read the landscape, react to environmental features, and deploy troops. Historians respond to their decisions in video snippets that convey the crucial role of environmental features. For example, users will decide how to navigate human modifications to the landscape, notably fortifications; how to deal with the fact that waterways on the battlefield had expanded due to rainfall; and how to manage the difficulties of fighting in the dark.
- Other potential features at this site include: video clips of virtual tour guides and/or living historians, overlaid onto the real world, to explain key developments in the battle; large-scale maps, offering the ability to zoom in and out, to visualize the wider context of the Petersburg campaign; audio/text excerpts from historical sources written by participants in the battle, driving home the importance of the environment and the sensory experiences of warfare.

**2. The trench site.** The main goals here are to enable visitors to visualize the ways soldiers manipulated the natural landscape and to see the environmental impact of warfare over the longer term. This site bridges our humanities themes #1 (showing how humans endeavored to transform and manage the natural environment as part of fighting the war) and #4 (deepening understanding of people who lived in the past through critical analysis of their writings). Key components include:

- Digital recreations of earthworks and other fortifications as they would have appeared in 1864-65. Using period photographs from similar earthworks and custom digital artwork, we will show how elaborate field fortifications had become by the latter stages of the Civil War. For example, we will use this photograph <<https://www.loc.gov/resource/cwpb.04090/>>, taken from a Union watchtower in the vicinity, to allow visitors to visualize the late-war landscape and see how drastically the conflict denuded the landscape.
- Fortification exercise, allowing visitors to digitally construct their own fortifications and see the results overlaid onto the real world. An introductory video will show different kinds of works--from simple trenches and earthworks using dirt; to fraises, abatis, gabion, and chevaux-de-frises (examples of defensive works created from felled trees or sticks); to traverses, cannon emplacements, and "bombproof" shelters. As users build their own fortifications, audio-visual feedback will clarify the strengths and weaknesses of different kinds of fortifications.
- Page scans of historical sources capturing soldiers' experiences. The documents will appear on the screen, accompanied by graphic-rich annotations and talking-head videos of historians explaining their methods of interpreting sources. The content of the letters will highlight our humanities themes, exploring topics like environmental issues and homefront connections.
- Other possible features include footage of actors, overlaid onto the real world, to recreate ordinary soldiers' perspectives on trench warfare; digital re-creations of winter quarters behind trenches to show another way the war altered the landscape; audio/text excerpts from historical sources written by soldiers who served here, focusing on the sensory experiences of trench warfare and the ways they interacted with the environment.

**3. Tudor Hall.** The overarching goal here is to foster deeper understanding of how the war impacted households and civilians (humanities theme #2). We will encourage visitors to reflect on the war's implications from a variety of different perspectives, including the opportunities and challenges the war presented to African Americans (humanities theme #3). Historical sources will reveal how the critical analysis of documents in context can lead to greater empathy with diverse Civil War Americans (humanities theme #4). Key components we are envisioning here include:

- Historical source interpretation exercise. We will guide visitors through three key documents: a Boisseau family will from 1838; the 1860 slave schedule of the U.S. Census, in which Joseph Boisseau claimed ownership of 18 people; and an 1863 tax record that listed 9 enslaved people. These documents will convey the difficulties of researching enslaved people with limited documentary evidence; the implications of a record-keeping system that defined some people as property; and wartime opportunities for resistance and escape. This exercise will feature expert audio narration and digital annotations to show how historians interpret documents.



- Interactive living historian videos that challenge visitors to think about life at Tudor Hall from different perspectives. Living historians representing people who lived and worked here--e.g. owners Joseph and Ann Boisseau; enslaved men and women; and officers headquartered in the home--will appear on screen and introduce visitors to their distinctive experiences. Users will also be able to select from a series of questions to ask: they might ask Ann Boisseau how the conflict affected gender relations within her household; they might ask a Confederate officer about the implications of conducting military labor within a domestic space; or they might ask an enslaved man or woman about the possibilities opened up by the proximity of the war.
- Interactive digital exhibit of James Fitz-James Caldwell's *History of a Brigade of South Carolinians*, a published account of McGowan's Brigade that Caldwell wrote while stationed at Tudor Hall in 1864-65. The exhibit will show that history was being constructed even as the war was still going on—and suggest how historical narratives are created and contested over time.
- Other possible features include additional living historian videos that place experiences at Tudor Hall within broader context, e.g. sharing stories of black U.S. soldiers who fought in the Petersburg Campaign, or inhabitants of refugee camps in other parts of Virginia such as Arlington or Alexandria.

#### **D. USER-GENERATED CONTENT**

At this point we do not anticipate including user-generated content.

#### **E. AUDIENCE AND DISTRIBUTION**

The audience will be visitors to Pamplin HP. Each year the park attracts 30,000-45,000 visitors, ranging from lifelong history enthusiasts to tourists with a casual interest in the subject. Since visitors have already demonstrated their interest in the subject matter, we anticipate many will want to try our application. The Park attracts many K-12 field trips, and we expect teachers to embrace the opportunity to enhance their students' visits. Once the AR experience is complete, we anticipate it could be used by 20,000 visitors per year.

Eventually, we may attempt to make the experience partly available off-site, for example using a Virtual Reality application available to anyone with a VR-viewer, or through a series of 360 degree videos that replicate key elements but that are accessible anywhere.

#### **F. RIGHTS, PERMISSIONS, AND LICENSING**

Pamplin Historical Park, as the host organization, will control rights to the materials and technologies being used.

## G. HUMANITIES ADVISERS

We have assembled a highly-qualified group of humanities advisers from the fields of education and Civil War era history. We selected advisers with expertise in the humanities themes discussed above: Civil War environmental history; the impact of the war on civilians; African American experiences; and the benefits of using critical historical thinking to interpret documents. Several of the advisers also have valuable experience with other digital humanities projects.

**Stephen Berry** is Gregory Professor of the Civil War Era at the University of Georgia, Co-Director of the Center for Virtual History, and Associate Academic Director for Digital Humanities at the Willson Center. His digital humanities experience includes creating the website *CSI: Dixie*, and his publications include influential studies of gender and the family in the Civil War era. Berry will help guide our emphasis on civilian experiences of the war and our appreciation of how digital techniques can open up new perspectives on Civil War history.

**Emmanuel Dabney** is a National Park Service Curator at the Petersburg National Battlefield. He has published and presented on various aspects of the Petersburg Campaign, including the roles played by United States Colored Troops, and has expertise on broader public history issues such as making historical sites more immersive and recovering hidden voices. Dabney will advise on public history methods and the African American history of Civil War Petersburg.

**Lorien Foote** is Patricia & Bookman Peters Professor in History at Texas A&M University. Her areas of expertise include the connections between military and homefront history, manhood and violence in the lives of Civil War soldiers, and the behind-the-lines experiences of Civil War POWs (a project that resulted in both a book and a companion digital humanities project). Foote will guide our efforts to bring together military and homefront histories.

**Hilary Green** is associate professor of Gender and Race Studies at the University of Alabama. Her research has focused on African Americans during the Civil War era. She has participated in or led several public/digital projects and recently co-authored an essay on what she termed “the problem of black invisibility” in the public digital humanities. Green will help shape our presentation of African American experiences in digital formats.

**Alan Marcus** is professor of Curriculum and Instruction at the University of Connecticut. His research focuses on history museum education and the use of media and film to teach difficult or hidden histories. His most recent research involves studying the viability of extended reality to support holocaust education in museums and centers in both the UK and USA. Marcus will advise on the uses of AR to support learning within informal educational settings.

**Eric Mink** is the cultural resource specialist and a Civil War historian at Fredericksburg and Spotsylvania National Military Park. He has expertise in public history, material culture, archaeology, and battlefield tours, and has published on Civil War primary source materials. Mink will assist in using artifacts and the physical landscape to convey humanities scholarship.

**Megan Kate Nelson** is a historian, writer, and creator of the website *Historista* (<http://www.megankatenelson.com/historista/>). Nelson is an expert in environmental, Civil War, and cultural history. Her award winning book *Ruin Nation* explored the destruction the Civil War wrought on forests, buildings, and bodies. She will provide insights into the natural and built environments of war, as well as soldiers' and civilians' cultural adaptations to war.

**Kenneth Noe** is Draughton Professor of Southern History at Auburn University. He has extensively published on Civil War military history, common soldiers, and, most recently, weather. He will contribute military and environmental expertise to the project, lending particular insights into the lived experiences of soldiers at Petersburg.

**Gabriel A. Reich** is associate professor of Teaching and Learning at Virginia Commonwealth University. Reich's area of expertise focuses on how young people come to understand history and apply historical frameworks to orientate themselves in the World, including collective memories of the Civil War and Emancipation. Reich will advise on how to design experiences that are attentive to diverse user groups' understandings of history.

**Anne Sarah Rubin** is professor of history at the University of Maryland and Associate Director of the Imaging Research Center. Her research focuses on the Civil War, Confederate nationalism, memory, and digital history. Her award winning work with electronic media includes such projects as *The Valley of the Shadow: The Eve of War*, and [shermansmarch.org](http://shermansmarch.org). Rubin will provide expertise on civilian experiences and digital approaches to the Civil War.

**Jeremy Stoddard** is associate professor of Curriculum and Instruction and the Faculty Chair of the Secondary Education Program at the University of Madison-Wisconsin. His research interests include the role of media, digital simulations and digital technologies in the learning of history in formal and informal settings - with a particular focus on engagement with difficult or marginalized histories and contemporary controversial issues. Stoddard will advise on designing AR to scaffold and support user engagement and learning.

**Amy Murrell Taylor** is the T. Marshall Hahn Jr. Professor of History at University of Kentucky. Her recent book, *Embattled Freedom: Journey's Through the Civil War's Slave Refugee Camps*, has received multiple prestigious awards. In addition to the expertise she will provide on enslaved refugees, she will contribute knowledge about Civil War families, cultural history, and environmental history.

**Stephanie van Hover** is professor of History and Social Science Education and Department Chair of Curriculum, Instruction and Special Education at the University of Virginia. Her research examines learning theory, instructional design and assessment in history education. She has also served as an

advisor for educational programming at such historic sites as Monticello in Virginia. van Hover will advise on the design and development of digital simulations for education.

## H. PROJECT AND DIGITAL MEDIA TEAMS

Our project team includes humanities scholars, computer scientists, and digital media specialists, and one of our great strengths is our integration into a unified transdisciplinary team. Each member of the digital media team is also a full member of the project team. Paul Quigley is project director and Principal Investigator; all other team members are Co-Principal Investigators.

### 1. Humanities-focused project team members

**Paul Quigley** is the James I. Robertson Jr. Associate Professor of Civil War Studies at Virginia Tech and Director of the Virginia Center for Civil War Studies. Quigley is a specialist in Civil War era history with experience working on transdisciplinary projects that use technology to present history to diverse audiences in innovative ways. For example, he was PI for “Mapping the Fourth of July in the Civil War Era,” a crowdsourced digital archive funded by the NHPRC. His book *Shifting Grounds: Nationalism and the American South* won awards from the American Civil War Museum and the British Association for American Studies. Quigley will serve as PI for this project, contributing both Civil War era history expertise and digital history experience.

**David Hicks** is professor of Curriculum and Instruction in the School of Education at Virginia Tech. He has a background in curriculum and instruction, the learning sciences, instructional design within immersive environments, and human computer interaction to support designing scaffolds to facilitate learning/training within and across formal and informal spaces. He will contribute his expertise on the design, development and evaluation of learning environments that utilize immersive experiences to help make the invisible visible.

**Kathryn Shively** is an associate professor of history and the associate director of Science, Technology, and Society at Virginia Commonwealth University, and book review editor for the *Journal of the Civil War Era*. Shively specializes in military, environmental, and medical history of the Civil War. Her book, *Nature’s Civil War: Common Soldiers and the Environment in 1862 Virginia*, won the 2014 Wiley-Silver Prize for best first book on the Civil War. Her digital experience includes the *History Engine* and a Civil War era study for the Lackawanna Valley Digital Archives. She will contribute expertise in Civil War history, including environmental-military connections.

**Tim Talbott** is the Director of Education, Interpretation, Visitor Services, and Collections at Pamplin Historical Park and the National Museum of the Civil War Soldier in Petersburg, Virginia. He earned his M.A. in Public History from Appalachian State University in 2005, where he focused his studies on the Civil War-era. Talbott’s primary area of research is the African American experience during the Civil War-era, and his publications include a study of slave advertisements in

Kentucky. He will lead the partnership with Pamplin HP and contribute expertise in military and African American history.

## 2. Digital Media-focused project team members

**Doug Bowman** is the Frank J. Maher Professor of Computer Science and the Director of the interdisciplinary Center for Human-Computer Interaction at Virginia Tech. His research focuses on user experience and interaction design for immersive technologies such as virtual reality and augmented reality. His work in 3D user interfaces earned him the IEEE VGTC Technical Achievement Award in Virtual Reality. On this project, he will work on the design of the user experience and user interface for the AR application, and will be involved in UX evaluation. In addition, as director of the Center for HCI, he will help facilitate access to resources, cross-disciplinary collaboration, and opportunities for outreach and dissemination.

**Zachary Duer** is assistant professor in the Creative Technologies Program in the School of Visual Arts at Virginia Tech. His studio art practice includes computational performance, virtual reality exhibition, and projection mapping, and he has an active record of collaborating across disciplines to create immersive learning environments. He was the principal programmer for a virtual reality recreation of World War I tunnels using passive haptics to increase immersion; *Belle2VR*, an educational virtual reality visualization of a subatomic physics supercollider; and *VTVirtualWeather*, a desktop, virtual reality, and mobile app which visualized voxelized wind velocity data of tornados. He will serve as a programmer and digital artist on this project.

**Corinne Guimont** is the Digital Scholarship Coordinator in Virginia Tech Publishing at the University Libraries at Virginia Tech. Her work focuses on coordinating efforts and supporting the development of digital humanities and publishing at the University, as well as creating sustainable digital scholarship. Guimont has been involved in several digital projects, most recently *The American Soldier* and *Social Networks in Georgian Britain*. She will support the long term sustainability of this project and the collaboration among the different groups involved.

**Kurt Luther** is assistant professor of computer science and (by courtesy) history at Virginia Tech. He is director of Civil War Photo Sleuth, an NSF-funded public history project combining crowdsourcing and face recognition to identify unknown soldiers in American Civil War-era portraits. The project has attracted over 15,000 registered users, identified hundreds of previously unknown photos for organizations like the Library of Congress, and been featured in *Smithsonian*, *Slate*, *NPR*, and *TIME*. He was named an Emerging Scholar by the American Civil War Museum and a finalist for the Army Historical Foundation's Distinguished Writing Awards. He will contribute expertise in human-computer interaction, digital military history, and Civil War photography.

**Todd Ogle** directs the Applied Research in Immersive Environments and Simulations program in the University Libraries and is the Associate Director for Immersive Experiences in the Center for Human-Computer Interaction at Virginia Tech. He holds affiliate assistant professorships in the Virginia Tech School of Education and Department of Computer Science. Ogle's research focuses on scaffolding learning performance in immersive learning experiences across disciplines. Ogle will

support the development of the immersive environment, supervising student developers and providing the bridge between experience and instructional design.

**Thomas Tucker** is associate professor in the Creative Technology Department in the School of Visual Arts at Virginia Tech. He has built an international profile in fine arts research through his exhibitions and collaborative research in Europe, Asia and the Middle East. His projects include dealing with body mechanics using motion capture; using technology to create a responsive virtual heritage environment in collaboration with art historians; using animation to describe internal organ movements in collaboration with biomolecular imaging specialists; and helping city councilmen visualize new traffic simulations and designing serious games. He will contribute expertise in AR design and digital art creation.

## I. STATE OF THE PROJECT

The project stems from two existing collaborations:

(1) the work of Virginia Tech's "[Visualizing History](https://youtu.be/O13ioaEC3Mg)" group, a transdisciplinary research team with experience on projects such as the "CI Spy" Augmented Reality application at an African American school (<https://youtu.be/O13ioaEC3Mg>); a Virtual Reality exploration of World War I tunnels in Vauquois, France (<https://youtu.be/VGs2r1u7e8k>); and Augmented Reality and Projection Mapping experiences to reveal hidden histories of Virginia Tech ([www.vt150.omeka.net](http://www.vt150.omeka.net)).

(2) connections between Virginia Tech's Virginia Center for Civil War Studies and the Pamplin Historical Park. The two have collaborated in various ways, such as exchanging visiting speakers.

In the summer of 2018 representatives from Virginia Tech (Quigley and Ogle) visited Pamplin HP to explore the possibilities for a collaborative project and came up with preliminary ideas. In the Fall of 2019, having identified the NEH "Digital Projects for the Public" grant as an ideal fit for our goals, we sought out additional team members and have held several meetings to prepare this application. We also recruited humanities advisers and solicited their feedback on a draft proposal.

## J. ORGANIZATION PROFILES

**The Virginia Center for Civil War Studies** (<https://civilwar.vt.edu/>). Located in Virginia Tech's History Department, the VCCWS was founded in 1999 to promote deeper understanding of Civil War era history among academics, teachers, and the general public. The center sponsors academic conferences on topics such as reconciliation following civil wars around the world; organizes public events that range from an annual Civil War Weekend to a regular Civil War Film Series at a local independent cinema; and sponsors public-facing digital projects such as "Mapping the Fourth of July in the Civil War Era."

**Pamplin Historical Park** (<https://pamplinpark.org/>). Pamplin Historical Park contains four museums, three historic homes, and the Breakthrough Battlefield, site of the critical Union action on April 2, 1865 that led to Lee's surrender at Appomattox. The site welcomes around 30,000-45,000 visitors each year, including many K-12 school field trips. Visitors can learn about soldiers' experiences at the National Museum of the Civil War Soldier, explore civilian lives at the restored Tudor Hall plantation home and reconstructed slave homes, and tour some of the best-preserved earthworks in the country.

**Center for Human-Computer Interaction** (<https://hci.icat.vt.edu>). HCI is a transdisciplinary field, drawing from the human sciences, humanities, computational sciences and engineering, information technologies, arts, and design. CHCI is a university-wide research center that facilitates transdisciplinary projects on the design of novel interactive experiences and the study of human interaction with and through technology. More than 50 scholars from more than 15 departments are involved. One of the key research thrusts within CHCI explores Immersive Experiences such as the one proposed here. All Virginia Tech members of this project team are affiliated with the Center.

## **K. FUNDRAISING PLAN**

So far, our project has been supported by staff time from the various institutions involved as well as a small amount of travel funding from Virginia Tech's Virginia Center for Civil War Studies.

During the planning stage, we will rely on a combination of NEH funding and institutional support from the Virginia Center for Civil War Studies at Virginia Tech and Pamplin Historical Park. We expect both organizations will contribute additional personnel time. The Virginia Center for Civil War Studies will also contribute voluntary cost-share to fund honoraria for our humanities advisers.

Following the Discovery grant period, we plan to apply for further support from the NEH (i.e. the prototyping level of Digital Projects for the Public) and will explore the possibility of applications to other funding bodies such as the National Science Foundation and the American Council of Learned Societies.

## **L. PROJECT EVALUATION**

During the Discovery phase, we will solicit feedback on our plans from stakeholder groups such as visitors to Pamplin HP and school teachers who take their students in field trips. Later, during the Prototyping and Production phases, we will build several rounds of stakeholder feedback into our iterative design process. We also plan to evaluate the efficacy of informal learning through Augmented Reality techniques, asking what users take away from the experience and in what ways AR supports deeper-level informal learning at public history sites.