

VANISHING LEAVES: A STUDY OF WALT WHITMAN THROUGH LOCATION-BASED
MOBILE TECHNOLOGIES

By

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A dissertation submitted to the Graduate Faculty in English in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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This manuscript has been read and accepted for the Graduate Faculty in English
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Philosophy.

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ABSTRACT

Vanishing Leaves: A Study of Walt Whitman Through Location-Based Mobile Technologies

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Abstract:

Vanishing Leaves is a location-based mobile experience (LBME), which employs mobile devices equipped with GPS and high-speed wireless internet capabilities to take users to Brooklyn Heights to learn about the poet Walt Whitman and his connection to the neighborhood where he lived, worked, and published the first edition of his masterwork *Leaves of Grass*. Through this active first-person immersive learning experience, *Vanishing Leaves* embraces experimental scholarly methods that extend outside the classroom and off the page in order to engage learners and invite them to create meaningful, personal connections to writers and their literary works.

The following white paper details the core concepts and inspiration underlying the development of *Vanishing Leaves*, including Whitman's mobile composing practices and the importance influence of walking on his work, as well as ecocomposition theory and its exploration of the dynamic relationship between the writer, their discourse, and the environment. Following this groundwork, a detailed examination of the capabilities of mobile devices relevant to this project is offered. This analysis highlights important research, concepts, and existing projects that illuminate the potential for LBMEs to help us better understand cultural figures, their historical contexts, and the important connection between place and discourse surrounding cultural texts. Finally, an overview of the development of *Vanishing Leaves* will provide details regarding its methods and objectives, as well as some of the major challenges and lessons learned throughout the process.

This white paper, instructions for playing *Vanishing Leaves*, and access to supplemental materials will be made available online at: <http://vanishingleaves.com>.

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Digital Manifest

Whitepaper, Appendices and Readme:

- Whitepaper
- Readme
- Gameplay instructions and walkthrough video
- Game audio files
- Game Script PDF

ARIS:

- ARIS repo
- ARIS DB Dump

Websites:

- Vanishing Leaves Game Website (<http://gc.vanishingleaves.com>): SQL, XML, WP, JSON Files
- White Paper Website (<http://vanishingleaves.com>): SQL, XML, WP, JSON Files
- WebRecorder WARC of: <http://gc.vanishingleaves.com>, <http://vanishingleaves.com>
- Wordpress 5.1.1
- Avada Theme 5.8.2

Note To Readers

Much of this dissertation is not found within the pages of the following white paper or on the project's website. It cannot be read, viewed, or approached as you would a traditional scholarly work. Instead, this dissertation is meant to be experienced! After you have read this document, follow the instructions at <http://gc.vanishingleaves.com> to download the game, find your way to Brooklyn Heights, and spend some time with Walt Whitman.

Introduction

Mobile devices have changed everything from our social interactions to our business practices, altering the ways we navigate and engage with our environment, interact with one another, compose and create, and understand and shape our identities. Despite their ubiquity and powerful functionality, mobile devices remain a largely untapped platform for pedagogical experiences in academia, particularly for the study of literature and composition and rhetoric. This white paper details the development and theory behind *Vanishing Leaves*, a Location-Based Mobile Experience (LBME) that takes players to Brooklyn Heights to learn about the poet Walt Whitman and his connection to the neighborhood where he lived, worked, and published the first edition of his masterwork *Leaves of Grass* in 1855.

Starting with Whitman's own mobile composing practices and the importance of walking to his creative practice, as well as an overview of key thinking from ecocomposition—a branch of composition theory which explores the relationship between environment and discourse—this white paper first outlines the core concepts and inspiration underlying the development of *Vanishing Leaves*. Then, following this groundwork, I conduct a detailed examination of the unique capabilities of mobile devices which are relevant to the project. This analysis will highlight important research, concepts, and projects in the field, detailing theoretical discourse surrounding the use of mobile devices as learning tools. It will also explore the potential of mobile devices to deliver immersive place-based learning experiences that help us better understand cultural figures, their historical contexts, and the important connection between place and discourse surrounding cultural texts. Finally, an overview of the *Vanishing Leaves* project will detail its major features, as well as the challenges and lessons learned throughout the development process.

Prelude: Camden



Fig. 1. With Walt Whitman in Camden. Photo: Jesse Merandy

A narrow shaft of fading afternoon sunlight cascaded across the worn wood floor, stretching to the edge of the bed where the poet Walt Whitman died surrounded by his closest friends and his nurse. I paused momentarily, deliberately falling behind the tour group at Whitman's Mickle Street residence in Camden, New Jersey, to search the bed's narrow frame and simple wooden headboard for some sense of the man who drew his last labored breaths there. Unsure of what I hoped to discover in the taut sheet covering the bed, undisturbed like a blank white page, I found that there was little sense of the poet whose groundbreaking, democratic, free-verse helped capture the promise and conflict of a growing nation. Instead of Whitman's mighty "barbaric yawp" sounding over the rooftops or his jubilant "songs" loudly celebrating his physical body and the sensory experiences of the world around him, there was a palpable sense of absence amplified by the quiet of the room.

It was in that moment of introspection, feeling disillusioned and discouraged, that my gaze fell upon a pair of the poet's galoshes on the floor, positioned at the foot of an old rocking chair as if ready to be slipped on. Much like the punctum that Roland Barthes describes in photography, this small detail in the scene unexpectedly caught my attention with a "lightning-light" prick, drawing me beyond the room and transporting me to the bustling streets of Brooklyn, the low hills of Long Island, and the bloody battlefields of the Civil War (27, 45). I immediately recalled Whitman's lines from *Leaves of Grass*, "I

bequeath myself to the dirt to grow from the grass I love,/If you want me again look for me under your bootsoles” (Leaves Of Grass 1855 56).¹ Just as I would find so many times throughout my journey researching and reading the poet, it was as if he were suddenly there at my side, guiding my way with his verse. It was as if he were offering a direction to approach the meaning of his life and work in that moment, a way to connect with him in a meaningful and personal way: “Failing to fetch me at first keep encouraged,/Missing me one place search another,/I stop some where waiting for you” (LOG 1855 56). Here in these simple shoes was a call to the open road, an invitation to walk by Whitman’s side and experience and actively engage the world in a lifelong search for meaning and knowledge. I smiled, gave the room one last parting glance, and then quickly turned to catch up with the group. Walt was out there waiting and there was much ground to cover.

Whitman: Jaunt, Ramble, and Stroll

Very remarkable. As we write this paragraph (11 o’clock A.M., 16th,) the sky is clear of clouds, and the sun is shining! If it continues so this afternoon, a certain pair of boots will have to, ‘suffer some.’ (Brooklyn Daily Eagle 16 November 1846)²

At the end of his life, confined to his Camden home and immobilized by his deteriorating health, Walt Whitman lamented to his good friend and biographer Horace Traubel, “It is getting very very monotonous—very monotonous: the same place all day long, days in and out: not even moving out of the room. I don’t appear to get up far if at all: rather retrograde than anything else: the main trouble is in my locomotion—my legs seem almost wholly given out” (With Walt Whitman In Camden vol. 3 523).³ As an enthusiastic walker throughout his life, few things were more painful for Whitman than his inability to move about on his own at the end of his life. Inevitably, even as they discussed politics, news, and reminisced about Whitman’s life, it was always these accounts of Traubel’s daily walks that would excite Walt’s interest. In one conversation, Traubel documented the poet’s response after detailing a recent lengthy excursion:

¹ LOG: Leaves of Grass. All Whitman poems featured throughout this paper will be referenced inline as LOG, edition year, and corresponding page number provided by the *Walt Whitman Archive*.

² BDE: Brooklyn Daily Eagle.

³ WWWIC: With Walt Whitman in Camden. All quotes from *With Walt Whitman in Camden* throughout this paper will be referenced inline as WWWIC, vol. number, and corresponding page number provided by the *Walt Whitman Archive*.

Told W. of our walk, he being in every way interested. "Why! it comes close to my old walks, long, long ago—brings the whole thing back to me. Oh! the exhilaration of such freedom—the going and coming—the being master of yourself and of the road! No one who is not a walker can begin to know it! (WWWIC8 326).

Whitman's impassioned remark illustrates how much he enjoyed living vicariously through Traubel's anecdotes, even insisting in another conversation that he must "walk these days for both of us" (WWWIC4 211), but it also reveals what a significant and inextricable aspect of his identity being a walker was. Walks were more than a simple mode of travel from one place to another. They were powerful experiences that had the ability to "get into a man's marrow" and "draw a long train of circumstances after them" (WWWIC8 291). This profound connection to the walk, seen throughout Whitman's journalism and poetry, provides a vital entry point to understanding his life and work. It offers a path to explore how he actively engaged and interacted with the places he lived, generating the experiences that would shape his identity and worldview, while also providing insight into both his creative process and final product. For Whitman, the walk served as a method to gather inspiration and as a tactic to communicate and commune with his audience. Taken together, these examples begin to lay the groundwork for how an active practice of walking might be used as a pedagogical approach to Whitman, moving learners beyond the printed page and out onto the streets where he lived, worked, and wrote.

Between 1846 and 1848, during Whitman's time as a journalist and editor for the *Brooklyn Daily Eagle*, the walk became a vital part of his daily routine and writing practice. Henry Sutton, a "Printer's Devil" during Whitman's editorship, recalled that in addition to his commute to work from nearby Myrtle Street, Walt would regularly embark on a walk after sending his editorials to the composing room (Rodgers xxi-xxiii). It was during these walks that Whitman would immerse himself in the flow of everyday life around him, engaging with the locals, collecting reminiscences of the notable events and colorful characters from Brooklyn's past, and documenting the present day issues and events that impacted the neighborhood and its readership. Each day he would distill his accumulated observations and conversations for use in his column, employing his sharp editorial eye to "discriminate the good from the immense mass of unreal stuff floating on all sides of him" (BDE 1 June 1846).

For Whitman, whose connection to Brooklyn Heights stretched back to his early childhood, there would have been much to see as he stepped out of the *Eagle* offices on Fulton street. With a population that grew from 40,000 to 100,000 residents between the years of 1845 and 1850, Brooklyn's landscape was being radically transformed from a rural farmland into a bustling transportation and shipping center teeming with immigrant workers (Reynolds 113). Frequently, Whitman's column would chronicle the many emerging problems plaguing the city as a result of these rapid changes, including inadequate street lighting, free-roaming livestock, poor drinking water, and a lack of sanitation services and public green spaces.⁴ Through first-person narratives, flush with visceral details, and informed by the depth of his personal experience living in the area over time, Whitman's editorial writing was imbued with the perspective and voice of a knowledgeable and trustworthy insider. Whitman scholar Jill Wacker referred to these "strolling, circulating accounts" as "panoramic narratives," a popular mid-century genre of writing she finds Whitman employed in an attempt to coalesce the "massive immigration and breakneck expansion of mid-century" (87). In one of his columns, "Philosophy of Ferries," Whitman attempts to capture the dangers of overcrowding facing the modern urban commuter. Putting himself at the center of a chaotic scene at Fulton Landing, he notes, "You get a swift view of the phantom-like semblance of humanity, as it is sometimes seen in dreams—but nothing more—unless it may be you are on the walk yourself, when the chances are in favor of a breath-destroying punch in the stomach" (BDE 13 August 1847). As someone who had been "on the walk" many times himself, it was his own experience as one in the crowd that made him keenly aware of impact of the neighborhood's rapid population growth and also supplied him with the vivid details and insights necessary to convincingly portray the issue to his readers.

Whitman's walks also became the subject of his editorials when he was in need of material to fill his columns. These "rambles" or "jaunts," as he liked to call them, were open-ended, unscripted explorations of Brooklyn and its environs that would often range for miles without direction or destination. By capturing his freeform journeys through the dense maze of industry, culture, and arts surrounding him, Whitman gave his readers a first-person view of the exhilarating nineteenth-century urban environment he

⁴ For more on Brooklyn's 19th century civic problems, see David Reynold's *Walt Whitman's America: a Cultural Biography*, pp. 108-109.

adored. For Whitman Scholar Bonnie Carr, these “observational sketches of city life” in his journalism had a strong connection to the flaneur tradition and helped him make sense of the “apparent chaos of urban life” (1). As a flaneur, which American literature scholar Dana Brand defines as “someone who without any set purpose, strolls through and observes the life of a city or town” (6), Carr felt that Whitman was attempting to process the diversity he encountered, ultimately creating a “social panorama” that celebrated the city as “ideally democratic.” (2)

In one remarkable piece, “Matters Which Were Seen and Done In An Afternoon Ramble,” Whitman ventures out into the city, blaming the beautiful weather for his inability to return to his desk (BDE 19 November 1846). The winding narrative that ensues documents his travels on foot through the streets of Brooklyn where he observes the rapid growth of the city: “Who says Brooklyn is not a growing glance? He surely cannot have walked lately, as we then walked, through East Brooklyn and South Brooklyn.” The trip then continues into Manhattan where Whitman takes in the “fascinating chaos” of Broadway: “there is a pleasure in walking up and down there awhile, and looking at the beautiful ladies, the bustle, the show, the glitter, and even the gaudiness.” It is only after visiting a sculpture gallery and watching a play that he concludes this meandering narrative, giving the impression that were there more space in the editorial column, his jaunt would surely have continued on. Through this ramble, we gain a sense of Whitman’s genuine adoration for the limitless possibilities and constant activity of the city, as well as his eagerness to absorb and share as much of it as possible. It was among the crowd, in close contact with the pulse and rhythm of the streets, that he was truly in his element, inspired by each new experience and encounter.

Although Whitman’s editorial rambles predominantly focused on his urban experiences, they also recounted his forays into the natural world. Born in Long Island, Whitman often returned to the rural countryside just outside of Brooklyn to explore the island to its easternmost tip, once boasting, “I know the whole shore well and well—have wandered it, I can almost say afoot” (WWWIC6 228). Similar to his city jaunts, this extended time on foot travelling the countryside afforded him an intimate first-hand perspective and knowledge of the environment through which he traversed; however, outside of the city, the walk took on a different quality. In one of his editorials, “Pleasant Two Hours’ Jaunt. — East Brooklyn Stages,” Whitman recommends a stage coach trip to the outskirts of Brooklyn for his readers and offers

the following instructions upon arrival at the city limits: “there walk about the pleasant, wide, tree-lined avenues; stretch your jaunt even a mile or two farther to the east, into the country, and saunter through the woods, and athwart the fields. Expand your chests and let your lungs take in the fullest possible supply of air that *is* air” (BDE 13 July 1847). With a dramatic increase in the death rates and the “psychological traumas associated with urbanization, market capitalism, and disillusion with politics,” David Reynolds notes that many “natural” forms of healing became popular during this time including, “regulation of diet, exercise, ventilation, temperance, and other personal habits” (331, 332). For Whitman, who extolled the health virtues of many different exercises throughout his life, the walk had no equal and “includes the whole expression of life, the passions, and the outshowing of active beauty” (MHT 28 November 1858).⁵ In his opinion the walk was, “nature’s great exercise—so far ahead of all others as to make them of no account in comparison” (MHT 17 October 1858). These jaunts in the countryside were a perfect opportunity to roam freely across farmlands and forests, leaving behind the overcrowding, pollution, and grid of streets that defined the urban lifestyle. Invigorated by each step deeper into the rural landscape and the corresponding inhale of fresh country air, Whitman draws attention to the walk’s physical and mental restorative properties.

In his poetry, Whitman continued to build upon and refine many of the tactics that he developed in his editorial work, particularly the use of the walk as a device to connect him with his readers. One of the core reasons this practice was successful was the fact that walking was relatable to a wide audience. Reynolds notes that Whitman frequently placed emphasis on the “common denominators of experience,” including “unifying phenomena” such as a sleep, work, and sex, which he could employ as poetic devices to “restore equilibrium and connectedness to apparently disconnected phenomena” (337-338). As a shared human experience that cut across age, gender, race, and socio-economic lines, Whitman was able to use the walk to draw a diverse audience into shared moments of intimacy before pursuing more complex concepts and philosophical musings. This application of the walk can be clearly seen in “Crossing Brooklyn Ferry,” where, in his notes, Whitman outlines his rough concept for the poem: “A City Walk: Just a list of all that is seen in a walk through the streets of Brooklyn & New York, and crossing the ferry” (A City Walk). Although the final poem focuses predominantly on the ferry passage, Whitman brings

⁵ MHT: Manly Health and Training. Whitman’s rediscovered journalism from *The New York Atlas*.

his readers along with him on this journey much like in his editorial city rambles, offering a flowing narrative brought to life through his observations accumulated, “on the walk in the street, and the passage over the river” (LOG 1860 379). It is through the simple nature of this experience that the reader is able to share Whitman’s perspective and begin walking with him in a shared virtual space realized within the poem. Here, the ordinary details of his surroundings—the watercraft on the river, the crowds of commuters, and the seagulls circling overhead—all act as additional points of connection between them, collapsing temporal and physical differences by emphasizing the many similarities of their experiences: “What is it, then, between us?/ What is the count of the scores or hundreds of years between us?/ Whatever it is, it avails not—distance avails not, and place avails not” (383). Helped by the conversational and informal voice he perfected in his editorials, this bond between poet and reader is reinforced and the illusion of Whitman’s presence intensifies, helping to materialize him not as a disembodied poetic voice, but as a poet of flesh and blood that once travelled the streets of Brooklyn and Manhattan, questioning, searching, and contemplating. If only for the length of the poem, Whitman is able to project himself from the past into the present through the walk, reaching beyond the page to announce to his audience, “I am with you, you men and women of a generation, or ever so many generations hence,/ I project myself—also I return—I am with you, and know how it is” (380).

With his readers at his side in this space, Whitman was able to demonstrate the importance of the walk as a device for unfettered exploration and inquiry, and as a simple, yet powerful, mechanism for generating profound and practical real-world knowledge and experiences. In “Poem of the Road,” later renamed “Song of the Open Road,” Whitman channels the spirit of his country jaunts, announcing, “Afoot and light-hearted, I take to the open road,/Healthy, free, the world before me,/The long brown path before me, leading wherever I choose.” (LOG 1860 315). It is here on the road, “loosed of limits and imaginary lines,” (318) that he fully embraces the opportunity to be his own master with the freedom to pursue his own direction. As an autodidact who had very little public education, Whitman celebrated the potency of self-directed learning and the attainment of knowledge through the mindful interaction with one’s environment. He came to understand through a lifetime of practice how to open himself to the potential of each experience and how to expand the breadth and depth of his attention in order to illuminate the meaning underlying the surface of all that he came in contact with—even the mundane and the

commonplace. For Whitman, this was a skill that was not taught in schools, nor was it something that could be “pass'd from one having it, to another not having it,” (319). Nonetheless, it was just as valuable as the knowledge acquired from more formal types of education which “may prove well in lecture-rooms, yet not prove at all under the spacious clouds, and along the landscape and flowing currents” (320). As Whitman scholar Harold Aspiz suggests, it was the “stones, trees, and buildings” that held the “road’s secret code,” a code that the “supersensory persona must read in order to gain insight into the world and himself.” By opening one’s self to the “cosmic influences that pervade nature’s realm,” a road was opened to “spiritual growth, self-discovery, and the empowerment to inspire others” (172, 170).

Extending a personal invitation for his readers to join him on the road, Whitman takes advantage of the intimate connection established by the walk to share his experiences and to encourage readers to pursue their own wisdom and active practices of meaning-making, “Allons! whoever you are, come travel with me!” (LOG 1860 321). Playing the role of the experienced, well-travelled guide, he reassures his readers that “It is safe—I have tried it—my own feet have tried it well” (328). He urges them to reexamine their surroundings and seek meaning and inspiration in all that they happen upon, just as he had done: “To take to your use out of the compact cities as you pass through,/To carry buildings and streets with you afterward wherever you go,/To gather the minds of men out of their brains as you encounter them—to gather the love out of their hearts (325). Reaching out his hand to provide readers with direction and support during these first steps was critical for Whitman; he knew that his proposed route was not easy and that the rewards one stood to reap were not the riches and “old smooth prizes” that appealed to most. Through this simulated experience of travelling together Whitman is able to advise his readers and shape their contemplative practices as they begin to search for the “divine things more beautiful than words can tell” (322) enveloped in the world around them. As the poem concludes, Whitman extends his invitation a final time: “will you give me yourself? Will you come travel with me?/ Shall we stick by each other as long as we live?” (328). In accepting this invitation, the reader gains a lifelong mentor and friend, and joins Whitman on the road with the “great companions”: the fellowship of intrepid, self-reliant men and women freely walking the earth in pursuit of knowledge and meaning.

In considering the use of the walk in Whitman’s writing, it is not surprising that he employed it as a device to connect with his readers and develop a space of intimacy and intellectual exchange. As much

as he sought the freedom of his solitary jaunts, it was the opportunity for prolonged and meaningful interactions, for direct and personal human contact, that he truly desired. At the end of his life, Whitman fondly recalled his many walks with notable visitors such as Henry David Thoreau and Ralph Waldo Emerson, recounting with pride the many miles they logged together. In remembering his time with William Cullen Bryant, Whitman wrote, “we were both walkers, and when I work’d in Brooklyn he several times came over, middle of afternoons, and we took rambles miles long, till dark, out towards Bedford or Flatbush, in company” (CPW 113-114).⁶ These lengthy strolls offered the perfect occasions to thoroughly acquaint themselves with one another, converse on a wide variety of topics, and discuss their craft and work.

However, despite the importance of the time he spent with these distinguished literary contemporaries, it was the walks with his closest friends and intimate companions that truly excited Whitman’s passions and left an indelible impression on his life, work, and memory. Nowhere is this more clear than in his memories of his perambulations with Peter Doyle, the friend and lover whom he met in Washington D.C. during the Civil War: “Oh! the long, long walks, way into the nights!—in the after hours—sometimes lasting till two or three in the morning! The air, the stars, the moon, the water—what a fullness of inspiration they imparted!—what exhilaration.” This moving passage reveals the extent to which the walk could evolve from a simple interaction into a transcendent experience between two people, fully present in the moment, time passing by unnoticed, and the war fading away into the background. This was the essence of the walk embedded deeply in Whitman’s marrow that he conveyed to his readers in his life’s work: “to get the ensemble of *Leaves of Grass* you have got to include such things as these—the walks, Pete’s friendship: yes, such things: they are absolutely necessary to the completion of the story” (WWWIC2 511-512).

⁶CPW: Complete Prose Works.

Interlude: Jayne's Hill



Fig. 2. Jayne's Hill. Photo: Jesse Merandy

With dusk fast approaching, I quickly pulled off of Reservoir Road, parked, and made my way to the Jayne's Hill trailhead. The fog hung thick in the woods and the stark outlines of the leafless trees and the small footpath quickly disappeared into the dense mist. Breaking up the decidedly foreboding atmosphere of the scene was an unmissable green sign at the path entrance which indicated that not only was Jayne's Hill the highest point in Long Island at 401 feet, but also that, "The great poet Walt Whitman is known to have walked here." I had only discovered the trail's existence hours before at the nearby Walt Whitman Birthplace State Historic Site on a graphic that mapped local points of interest related to the poet. Unsure when I would return to the area again, and feeling spontaneous, I decided to embrace the opportunity to spend some more time with Walt in the natural surroundings where he spent the first years of his life before moving with his family to Brooklyn.

As I entered the trail, I remembered several lines of Whitman's poetry that I had read early that day: "There was a child went forth every day, / And the first object he look'd upon, that object he became, / And that object became part of him for the day or a certain part of the day, / Or for many years or stretching cycles of years" (LOG 1891 283). I wondered what lasting impression this bucolic landscape

had on Whitman and how the cycle of seasons, crops, and livestock, along with his deep family roots in the area, influenced his work and his worldview. Did it inform his use of grass and other natural elements throughout his work? Did his time immersed in the complexity of the surrounding natural ecosystem plant the seed for the “simple, compact, well-joined scheme”(LOG 1860 379) he envisioned connecting all things and all people to one another? Meditating on these questions and Whitman’s early influences I continued on, the woods laced with fog obscuring my view in all directions and wrapping me in a space of silent contemplation. Only the sound and smell of the wet, decaying leaves peeling up as I walked over them managed to break my musing and bring my attention back to the present moment. I examined the ground cover and noted how quickly the once vibrant individual leaves had become indistinguishable from one another, pressed into a matted layer soon to be returned to the soil. I was reminded once again of Whitman’s poetry: “I bequeath myself to the dirt to grow from the grass I love” (LOG 1855 56). This time the line resonated differently with me, provoking thoughts of Whitman’s death in his Camden house, but also his 72 years of life, innumerable experiences and conversations, hundreds of poems, relationships with family and friends, and countless miles walked; everything between his final breath and his first. As I passed through the early-winter landscape, I felt like I was recovering a moment from this compressed mesh of history, pulling out a single leaf from the dirt that, although weathered, still retained remnants of its color and form.

When the path finally leveled off at the summit, I was surprised to discover a large boulder sitting in a clearing adorned with a metal plaque featuring Whitman’s short poem “Paumanok,” his tribute to the natural beauty of this land which had nurtured him as a child and to which he had returned throughout his life. As I looked around, I couldn’t help but laugh; I was at the highest point in Long Island, yet the fog surrounding me made it feel like I had been dropped into the middle of a cloud with Whitman and this Paumanok rock. It was an ironic reminder that, even as I travelled the same grounds as Walt and searched for our commonalities and connections, my experiences would inevitably differ from his and that an important part of undertaking the walk was discovering those distinctions and finding my own personal significance in each moment. This was one of those thought-provoking, sometimes comical moments of insight—a sort of trail marker along my journey with Whitman—that reminded me to keep my eyes and mind open and to enjoy the path I was walking even if I couldn’t see five steps in front of me.

Ecocomposition: The Writing Experience and Place

Ecocomposition, a branch of composition theory dedicated to exploring the relationship between writers and their physical contexts, provides valuable insights into the important connections between Whitman's writing, the walk, and the places he lived. With its roots in composition and rhetoric scholarship such as Richard Coe's 1975 article "Eco-Logic for the Composition Classroom" and Marilyn Cooper's 1986 essay "The Ecology of Writing," ecocomposition rose to prominence following the post-process movement in the late 1990s. This moment in the field centered on important dialogue about the impact of race, gender, sexuality, class, and the multitude of other factors influencing discourse creation. Sidney Dobrin and Christian Weisser, two of ecocomposition's lead practitioners, define the theory as follows:

Ecocomposition is the study of the relationships between environments (and by that we mean natural, constructed, and even imagined places) and discourse (speaking, writing, and thinking). Ecocomposition draws from disciplines that study discourse (primarily composition, but also including literary studies, communication, cultural studies, linguistics, and philosophy) and merges their perspectives with work in disciplines that examine environment (these include ecology, environmental studies, sociobiology, and other "hard" sciences). As a result, ecocomposition attempts to provide a holistic, encompassing framework for studies of the relationship between discourse and environment. (Breaking Ground 572)⁷

This theoretical framework informs two important aspects of *Vanishing Leaves*. First, it helps to think more deeply about Whitman, his connection to Brooklyn Heights, and how his environment influenced and informed his work while also tapping into broader questions regarding the interplay between discourse, identity, and place; the nature of inspiration and artistic creation; and the basic human desire to share and communicate experience and knowledge. Second, with its stress on practice and pedagogy, ecocomposition informs the development of the project's user experience, particularly in thinking through the integration and deployment of mobile devices as composing and learning tools outside of traditional sites of learning.

⁷ Referred to for subsequent inline citations as BG.

One of the primary appeals of ecocomposition theory is its focus on recovering the importance of physical context in the creation of discourse by resituating the writer within the intricate environmental networks they engage with throughout the composing process. As Sidney Dobrin reflects, “Writing grew from a need to express and record human relationships with places and with the organisms that inhabit places” (Writing Takes Place 23). He and Weisser trace this relationship back to the earliest examples of human records including the cave paintings (logograms) of Altamira, Egyptian hieroglyphics, and Sanskrit texts where writing in its various forms was used as a means to “record, count, calculate, codify, and taxonomize human relationships with nature” (Natural Discourse 63).⁸ It is through the analysis of our documented human experiences and thoughts that we are able to open a portal to explore the past of place and from there contemplate the impact of various environmental factors on writers and their works. In approaching Whitman’s writing, especially through the lens of the walk, environment is revealed to be central to his creative process. Ecocomposition creates a space through his work to step back into nineteenth century in order to consider the environmental elements that both inspired and influenced Whitman, from the rapidly growing urban landscapes of Brooklyn and Manhattan to the rural farmlands and forests of Long Island, each location touching the poet in some way. Observing the choices he made in his writing, his response to the stimuli he encountered daily, including the details and subjects he focused on, are all instrumental to a clearer understanding of Whitman’s identity and work.

The process of expanding the relationship between writer and context, however, makes it increasingly necessary to acknowledge that Whitman was not solely absorbing and recording details from his surroundings; he was actively thinking through his experiences, attempting to make sense of the world around him, and then responding and writing back to those surroundings. This dialogue—dynamic, ongoing, and coconstructive—is another essential aspect of the ecological roots of ecocomposition. As Dobrin succinctly states, “Writers engage in circular reinscription of place and environment that in turn writes who they are as writers” (Writing Takes Place 19). Working from this dynamic, the writer is moved from the center of the investigation into a network of interrelated components and systems. Marilyn Cooper evoked this thinking as a way to understand discourse as an emergent product of “ever-changing systems,” which it is “constituted by and constitutive of” (373). Composition and rhetoric scholar Margaret

⁸ Referred to for subsequent inline citations as ND.

Syverson found that utilizing an ecological systems approach helped to prevent focusing exclusively on the individual in isolation, a shift that was necessary to truly understand the writing situation. “The wealth of reality” she forwards, “is richly complex, interdependent, and emergent; we are embedded in and co-evolving with our environments, which include other people as well as social and physical structures and processes” (xiv-xv).

By complicating the writing moment as ongoing and in constant dialogue with countless external factors, ecomposition aims to move toward a more comprehensive and complex understanding of the writer and the creative process. In considering the walk as a vital part of Whitman’s work and life, this approach helps to place him in motion, traversing a continually changing landscape over time, each location and moment containing its own unique intersection of circumstances which impacted his work in both subtle and dramatic ways. As Dobrin and Weisser note, “As writers shift from one environment to another, they readjust their discourses to match. Much as in genetic evolution, writers display certain characteristics in their writing that are determined by the environment in which they write” (BG 576). Through these adjustments, what they refer to as “acclimation” elsewhere, the writer continually alters their discourse based on the writing environment, an act of revision that is essential to the success and impact of one’s expression (ND 76). This complexity also acknowledges the immediate and long-term impact of Whitman’s discourse on the environment, which are key to gaining a full understanding of his relationship to the neighborhood where he lived and worked. During his lifetime, this impact was visible through his journalism which led to tangible improvements in civic services as well as the creation of public green spaces in Brooklyn. Today, his poetic works continue to influence the neighborhood where he once lived, manifesting at sites such as Walt Whitman Park and Fulton Ferry Landing, where his writing is literally etched onto the landscape.

Bringing into focus the ecological matrix from which Whitman’s work emerged helps us to better understand our own unique environmental circumstances and composing practices. We can begin to note the ways we are affected and inspired by our surroundings and pull back the veil on the complex systems in which we both knowingly and unwittingly participate. Weisser remarks that through the recovery of the “ecological dimensions of selfhood” and a “greening of identity,” we can start perceiving the inseparable interconnection we have with our surroundings and recognize “that the material world ‘out there’ is part of

our identity ‘in here’” (Place, Identity, and Greening 86-87). Using Whitman as a representative figure, and “greening” his identity provides us with a framework to reconsider our own experiences, particularly when that examination takes place through shared locations. Exploring through a common ground can shed light on the changing nature of place and the countless evolving factors which comprise and affect these locations, while at the same time illuminating the commonalities that weave our experiences together at these sites. Through this awareness we can begin to contemplate what our writing reveals about our identities and contexts, as well as the power and responsibility that our discourse inherently carries with it.

For writers to truly be aware of and understand the systems that they are influencing and that are acting upon them, ecocomposition strongly advocates for the development and implementation of methods that engage learners in composing practices in diverse environmental settings. Throughout their various writings, Dobrin and Weisser make clear that the focus of ecocomposition should always be on the production of writing and not interpretation. Ecocomposition recenters attention on the writer’s work and the development of “hands-on experiences” that lead to discourse production across a “range of environments.” For them, it is only through these experiences that the writer is able to gain a true understanding of their own discursive tactics and their shifting nature in relationship to these places (ND 57).

In order to provide these composing experiences, ecocomposition advocates for an “active praxis,” one that moves writers out of the classroom and into the natural settings where they compose (ND 115). As Nedra Reynolds argues, “where writing instruction takes place has everything to do with how” (20). Moving out of the classroom allows us to recover the sensorial and physical nature of the writing experience which Syverson argues, is all too often suppressed through academic life (12). Julie Drew, in her essay “The Politics of Place: Student Travelers and Pedagogical Maps,” suggests that we reimagine students as travelers, acknowledging their constant navigation between discourse communities in their lives outside of the classroom (60-62). Ultimately, she argues, teachers need to be open to alternate sites of discourse production: “If we are truly interested in the pedagogical, in teaching and learning, then students must be invited to name and explore the ways in which they embody the many spaces they inhabit, and the discourses in which they both do and hope to participate” (66). In developing

a project that looks to foster deeper personal connections to Whitman, it seems natural to utilize the places where his writing emerged from as a starting point while solidifying that connection through the shared experience of writing from those same locations. The notion of the student as traveller provides a perfect symbolic link to Whitman and his experiences walking. It is a vision of the writer as mobile, in flux, and engaged with the environment, exploring firsthand the complexity of discourse and knowledge production across a range of locations, just as Whitman did.

In addition, ecocomposition complements and informs the implementation of mobile devices as a featured learning tool in the *Vanishing Leaves* project. Although the connection between the two may seem counterintuitive at first, ecocomposition's holistic view of the environment takes into account both the organic and inorganic including, "natural, urban, constructed, political, personal, virtual, and even imagined spaces." (ND 8). This inclusivity "resists discursive maneuvers that create dualistic splits such as nature/culture and (hu)man-made/natural" and instead focuses on a "connected world view over separation of human life from nonhuman life and biosystems" (10). Reclaiming this connection and embracing mobile devices and virtual spaces as vital and inseparable elements of our environments allows us to contemplate our direct relationship with technology and examine what these interactions reveal on personal and macro levels.

Early in their work on ecocomposition, Dobrin and Weisser looked to webbed writing environments and hypertext writing assignments to help illustrate and reproduce many of the ecological concepts that they were exploring. Citing their associative properties, collaborative potential, decentered and responsive structure, and diverse multimedia expressions, these projects offered a participative discursive ecosystem that made visible the interconnectivity of each individual element within the structure (BG 584-585). Mobile devices further realize the potential that Dobrin and Weisser saw in online writing spaces.

First, through access to high-speed internet and geolocation features, mobile devices have become interfaces to our landscapes, bringing together the virtual and the physical in ways that help make visible the complexity of our intricate relationships with our environments. The extensive web of online information that is mapped onto physical locations allows us to explore the histories and events that shaped these places, including the layers of human experience and thought embedded there.

Second, through these personal communication devices, we not only access information in places, but also continually write back to them. This dialogic relationship allows us to compose, often while in motion, to multiple discourse communities, shifting our voice and adjusting our tactics depending on the location and the audience. Here, the co-constructive relationship central to ecocomposition is manifested, allowing us to see in real-time the connections between discourse production and place.

Finally, for educators interested in the ecological concepts and the active praxis promoted by ecocomposition, mobile devices become an ideal tool for delivering personal, place-based learning experiences outside of the classroom that emphasize the production of writing across a variety of discursive environments. Using mobile devices, learners can be led to targeted locations in order to examine specific aspects of the discourse ecosystem, they can be engaged in writing exercises that highlight the complexities of the creative process, and they can be made aware of their unique relationship to the larger, ever-changing network of systems within which they exist and interact.

Interlude: Brooklyn Heights - Fulton Landing

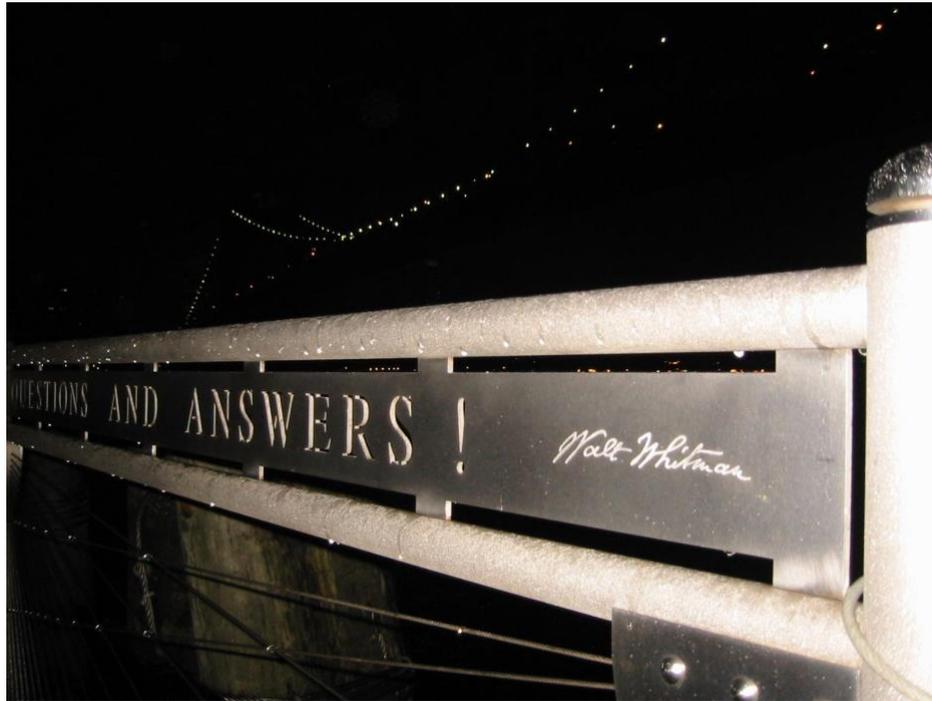


Fig. 3. Fulton Ferry Landing. Photo: Jesse Merandy

As I made my way across Cadman Plaza Park to Whitman Park, I retreated further into my winter coat to avoid the cold rain misting my face. In what seemed to be a hallmark of my early Whitman explorations, I had acted spontaneously and neglected the baseline planning that would have prevented my arrival in the dark and in inclement weather. Still, as I approached my destination, I grew increasingly excited. Since my visit to Whitman's birthplace and Jayne's Hill, I had been anxious to connect with Walt in the city where he had spent nearly forty years of his life and where he had written and published the first edition of *Leaves of Grass*.

Although there were many chapters in Whitman's life, his time living and working in Brooklyn Heights during the mid-nineteenth century remained incredibly appealing to me. On this ground, before the Civil War carried him away, Whitman came into his full creative powers, coalescing the promise and anxiety of the nation and the excitement and vibrance of the rapidly changing urban environment around him. Thanks in part to my limited visibility, I conjured this romanticized version of Whitman and the past onto world around me for a moment before the illusion was abruptly dissolved upon my arrival at Whitman

Park. Standing in front of a dimly lit, green New York City parks sign marking the entrance, I looked out upon an unimpressive plot of grass and a fenced-in parking lot. A couple of steps away another sign detailed Whitman's life, but made barely a mention of his history and connection to the neighborhood or this spot. Aside from the name on the sign, Whitman was nowhere to be found in his own park.

Putting aside the disappointment of this experience, I decided to press on and visit the second destination I had plotted for my visit, the former location of the Rome Print Shop where the first edition of *Leaves of Grass* was published. Even though I was aware that the building had been demolished in the 1950s during Robert Moses's urban renewal project in the neighborhood, the significance of the loss did not strike me until I stood at the historic site which was now a nondescript courtyard outside of the High Street subway station. The only remaining connection to the poet was a small sign labelled Whitman Owner Corp which was affixed to a nearby building complex, an ironic reminder of the site's lost history and the many changes which had obscured it over time. Disheartened, I contemplated the absence of Whitman and whether or not the neighborhood had changed so dramatically that all traces of him had been purged. I also wondered what it meant to lose this important connection and what could be done to resurface and preserve it in a meaningful way.

With the rain subsiding, and having already made the journey out to the neighborhood, I decided to continue walking down Fulton Street to the waterfront. The once bustling thoroughfare, which during Whitman's time would have been lined with vendors, shops, and carts full of goods was quiet now. The road curved to the water where the lights of the Brooklyn Bridge hung in the blackness over the East River like some earthbound constellation. As the Fulton Ferry Landing came into view, lines from "Crossing Brooklyn Ferry" filled my head and it felt as if Walt were suddenly walking beside me again: "What is it, then, between us? What is the count of the scores or hundreds of years between us?/ Whatever it is, it avails not—distance avails not, and place avails not" (LOG 1860 383). I imagined crowds of commuters rushing by us to catch Robert Fulton's steam ferry, the distant Manhattan skyline holding the promise of work, adventure, and love. Walking out onto the landing, I was once again aware of my surroundings, the sound of the river swelling and the Brooklyn Bridge caisson looming like a silent stone sentinel overhead. In that moment, the potent history of the location and the present overlapped, playing out simultaneously as I continued further out onto the landing, Whitman's voice and presence growing

stronger with each step, “Closer yet I approach you,/ What thought you have of me, I had as much of you—I laid in my stores in advance” (384).

Grasping the cold, wet marine railing lining the edge of the pier, I was abruptly jolted out of my reverie, noticing that below my hand Whitman’s signature was etched in the silver metal preceded by an exclamation point and the word “ANSWERS.” In disbelief, I stepped back and suddenly realized that I was looking at a line from “Crossing Brooklyn Ferry,” and that it was part of a larger passage that extended around the entire pier: “Throb, baffled and curious brain! throw out questions and answers!” After all the time I had spent looking for some tangible connection to Whitman, here I was unexpectedly surrounded by his poetry. Even though I knew it could not be possible, it felt as though this was message that had been left by Walt urging me to remain steadfast in my pursuit of knowledge even when the path was uncertain. To come to this ground and walk in Whitman’s footsteps, to contemplate his life and work and the history embedded in these locations, even when obscured by time and change, was a valuable opportunity to engage in an active process of inquiry, an experience that in the end not only helped me connect with Walt in intimate and unexpected ways, but also prompted me to begin thinking through and formulating questions pertaining to my own life, context, and relationship to place.

Looking out from the pier where Whitman and countless others had started and ended their journeys, I considered my part in the human history that had occurred at this location and wondered how I might use my experience to help guide the next wave of scholars and devotees in their search for the poet. How could I bring them to this neighborhood to walk the streets with Whitman as I had done, help them learn about the rich history there, and encourage them to engage in the deep questioning and contemplation that had so profoundly moved me? These questions remained unanswered in that moment, but I knew now that I had come to this crossroads to discover my direction and that the path was now clear in front of me. Pausing for a moment more, I began to walk back to the subway, knowing I would return soon, in better weather, definitely in the daytime -- and maybe, next time, I would bring some friends along.

Location-Based Mobile Experiences

In considering learning methods capable of generating meaningful connections to Walt Whitman, ones that honored the important role of the walk in his life and work, and that took into account the valuable insights of ecocomposition, major inspiration came from projects that leveraged personal mobile devices to deliver active, place-based learning experiences. Blending elements of gaming and narrative, these Location-Based Mobile Experiences (LBMEs) creatively connect the vast amount of information online to our physical environment, creating opportunities to explore and respond to the layers of human history linked to relevant sites of interest. This section offers an in-depth exploration of LBMEs and their unique capabilities and affordances. Starting with an overview of the key mobile technologies and functionality underlying these experiences, a survey of important projects will be offered to elucidate the tactics and techniques and the unique potential they hold for use in academia.

Our embodied experiences of place are instrumental in understanding the world around us and our relationship to it. Essential for our survival and continued growth, the knowledge we acquire from these experiences constantly evolves as we expose ourselves to new situations and environmental stimuli. As human geographer Yi-Fu Tuan argues in *Space and Place: The Perspective of Experience*,

To experience is to learn; it means acting on the given and creating out of the given...To experience in the active sense requires that one venture forth into the unfamiliar and experiment with the elusive and the uncertain. To become an expert one must dare to confront the perils of the new (9).

For Tuan, it is only through our personal explorations, and the necessary contemplation of these experiences with an “active and reflective mind,” that we are truly able to know ourselves and our environment (18).

With the introduction of technology, our embodied experience of the world can be dramatically altered, fundamentally changing how we approach our physical environment and expanding the possibilities for learning available to us at the locations we interact with. It is a technologically mediated experience that computer scientist Paul Dourish refers to as “embodied interaction,” or the “creation, manipulation, and sharing of meaning through engaged interaction with artifacts” (126). Much of the potential of these interactions is made possible through our interface created by the hardware and

software of the technology, which digital media scholar Kimon Keramidas, in his work *Interface Experience*, helps to distill: “the design of hardware becomes central to our understanding of the experience of interface, because of how it determines the real and perceived affordances made available to the user, both with regard to the physical interaction with the device and the range of possible operations that can be enacted via software” (17). Until recently, the hardware and software design of personal computing technologies, particularly those tethered to the wall, focused primarily on providing users with an intuitive interface to engage the digital world from a stationary location, relegating place to the background of the experience. With the introduction of modern mobile devices equipped with Global Positioning System (GPS) and high-speed wireless internet capabilities, this interface dynamic has been inserted into our everyday embodied experiences of place, merging the digital and physical worlds which were once distinct from one another. As mobile theorist Adriana de Souza e Silva observed in her article “Cyber to Hybrid: Mobile Technologies as Interfaces of Hybrid Spaces,” with mobile devices digital information flows which were once restricted to cyberspace were now “flowing into and out of physical space, blurring the borders between both.” It is in the increasing conflation of these two worlds that she envisions the emergence of a new “hybrid space,” one that creates new opportunities and also requires a new set of practices to negotiate (265, 262).

At the center of the changes to our embodied experiences of place, and of key importance to this project, is the ability to receive, access, and contribute to the wealth of online information using geolocation. Mobile devices, always on and always with us, constantly track our location and provide an instant connection to this useful contextual information, informing the decisions we make, the directions we take, how we interact with one another, compose and create, and ultimately, how we understand and shape our identity. In their book *NetLocality: Why Location Matters in a Networked World*, Eric Gordon and Adriana de Souza e Silva explore the growing use of this data with location-aware smart phones: “(contextualized data) is useful and convenient. It naturalizes a connection that was only metaphorical before. It takes the otherness of the web and places it squarely into where you are. This is net locality.” For them, this concept of net locality, or “networked locality,” indicated a radical shift that placed geography as the “new organizing logic of the web” (2,3). Jason Farman, in his book *Mobile Interface Theory: Embodied Space and Locative Media*, similarly found that our increasing use of contextual

information has transformed our physical environment into “information interfaces much like the graphical user interface of a computer screen.” As a result, we have now become “entirely reliant on the seamless interaction between our devices and our landscapes,” constantly using this information to inform our sense of direction and purpose at place, what he calls “embodied implacement” (43,46, 40).

Leveraging these emerging place-based practices with mobile devices, commercial developers, artists, and scholars have created a wide variety of location-based mobile experiences that exploit the use of geolocated and contextual data. From task-specific applications to innovative educational projects, these LBMEs have become thoroughly integrated into our everyday lives. Today, after a decade of widespread use and with learners increasingly developing mobile device skills at an early age, it is easy to forget the profound impact these projects have had on our lives, particularly on our place-based practices and experiences. We barely pause as we search for and instantly receive historical information pertaining to nearby landmarks, we routinely tag our location on social media posts to share with our friends and family, and it is now commonplace to open a mapping application, search for a location, and then follow our progress on the map as we are guided by real-time, turn-by-turn directions to our destination. It is also easy to overlook the complex interrelated advancements in mobile hardware, software, and infrastructure that evolved nearly simultaneously over that past ten years to make these experiences possible. It is this decreased awareness that leads to what Henry Jenkins refers to as the *transparency problem*, a circumstance in which users are unable to examine and assess technologies as a result of familiarity gained from continued use over time (xii-xii). In order to properly ground the LBMEs discussed in depth moving forward, it is helpful to review some of these major technological developments and unpack some of the essential tactics and types of LBMEs which have emerged as a result of these advances.

In anticipation of FCC regulation E911—which mandated that cellular phones sold in the United States be made location-aware by October 1, 2001—J.C Spohrer conceived the *WorldBoard*, a global infrastructure that could link the vast network of digital information being accumulated online to physical places (602). To interface with this “information associated with places on a planetary scale,” he envisioned a location-aware device, a “client” with wireless communication that possessed both navigation and authoring capabilities (606). Although his preference was to implement a head-mounted

display to access and utilize this information—much like the now defunct Google Glass—he also detailed an alternative handheld device that could act as a window, or “porthole,” to online “geocoded” data. With these devices, opportunities to easily access and use place- and situation-specific “contextualized information” could be shaped based on a user’s personal requirements, and could be repurposed and contributed to endlessly (624). Once the *WorldBoard* was in place, he predicted that it would effectively merge the electronic and physical worlds and could be employed for a host of commercial and non-commercial applications including revealing natural and cultural aspects of locations which were hidden or invisible; augmenting and overlaying sites with information or media; changing the physical appearance of the environment; and, finally, making visible and activating the embedded histories and future possibilities of place (618).

However, even as he outlined these possibilities, many of which remain core to LBMEs, Spohrer was cognizant of the substantial technological obstacles that prevented his vision from becoming a reality:

Can the necessary functionality be packaged in a small, lightweight, mobile device that has adequate battery life, processing power, and storage capacity to be viable? What is the coverage area of the wireless communication, bandwidth, cost, and communication standard employed? What is the coverage area of the positioning technology, its accuracy and ability to produce orientation as well as location data, and the rate of position updates?" (611)

What he could not have anticipated was that in a little less than ten years an incredible convergence of technologies would transform our personal mobile phones from communication tools with limited additional functionality into powerful and pervasive computing devices that would realize and make available many of the applications for geolocated data that he envisioned.

At the center of these advances was the addition of a GPS receiver to mobile phones, which made it possible to determine a user’s position and track their movements through communication with a network of satellites. Although this system was largely in place by the late 1980s, access to the service for commercial and civilian use was deliberately throttled by the US military for reasons of national security. This policy, referred to as “selective availability,” remained in place until 2000 when Bill Clinton

passed the “Improving the Civilian Global Positioning System (GPS)” mandate, which removed the restrictions and dramatically improved GPS accuracy overnight.⁹

The second concurrent critical development was the launch of high-speed wireless internet connectivity, otherwise known as wireless broadband, for mobile devices. These “3G” networks, first established in Japan in 2001 by NTT DoCoMo¹⁰ and then a year later by Verizon in the United States, were a dramatic upgrade from 2G speeds which, at data transfer rates around .5 mbps, only allowed for the transfer of SMS and MMS messages. At 63 mbps, 3G speeds made mobile Internet access and video calls possible.¹¹ In addition, mobile devices also began utilizing improvements to network speeds and infrastructure to further improve GPS accuracy to within a few feet. This system, known as assisted GPS (A-GPS), made it possible to consistently and continuously determine a device’s location even when satellite signals were degraded by physical obstacles, such as tall buildings, or poor weather conditions (Ionescu).

Another major outcome of improved data transfer speeds was the ability for users to download application software directly to their mobile devices, leading to the rise of the “app culture” and the first generation of “smartphones.” In 2008, with the launch of Apple’s App Store and the Android Market, later rebranded as Google Play, the use of applications capable of leveraging and extending device hardware and functionality was quickly popularized, a subset of which were specifically developed to utilize the newly added GPS functionality.¹² Instead of Spohrer’s proposed network of “geospatial portals,” which would have been accessed through a mobile web browser for a wide variety of purposes, mobile users began embracing task-specific, location-based applications. Navigation tools such as Google Maps simplified everyday tasks such as navigating between locations and finding nearby businesses. Health and Fitness apps like Nike Running Club allowed users to track and plan running routes, charting their progress over time and enabling them to share this information with others. Mobile Social Networks like

⁹ “President Clinton: Improving the Civilian Global Positioning System (GPS)” https://clintonwhitehouse4.archives.gov/WH/New/html/20000501_2.html, Accessed 14 March 2019.

¹⁰ De Souza e Silva 2011, pg. 42.

¹¹ For more details on the evolution of mobile technology, see “The Evolution of Mobile Technologies: 1G->2G ->3G-> 4GLTE.” Qualcomm, June 2014.

¹² For more on the app culture see “The Rise of Apps Culture,” by Kristen Purcell, Roger Entner and Nichole Henderson.

Instagram and Facebook brought our experiences of place to others through geotagged multimedia posts and tags.

In addition to these practical applications, others looked to create unique LBMEs for educational and entertainment purposes that challenged user's understanding of and relationships to place, inviting them to play, interact, and explore locations in new ways. Among these, two main categories of projects, Location-Based Mobile Narratives (LBMN), and Location-Based Mobile Games (LBMG), emerged which take familiar genres and reimagine them, untethering them from the computer screen, game board, and page to interweave them into the fabric of our physical environment. A brief overview of these two notable groups of projects and their use of geolocation provides a useful starting point in understanding the innovative and varied approaches that inspired *Vanishing Leaves* and which will be explored in greater depth in this section.

Types of LBMEs

Location Based Mobile Games

The first group of projects, Location-Based Mobile Games (LBMG) leverage geolocated information and mobile device functionality to create entertaining and engaging experiences that require users to coordinate between the digital and physical worlds in order to complete an objective or series of tasks. Also referred to as Hybrid Reality Games (HRG), many of the first instances of these games were designed for play in urban environments where large numbers of potential users with smartphones resided. In addition, these locations were often well-mapped, and offered stable internet connectivity to users that mitigated disruptions to gameplay and disconnections. Adriana de Souza e Silva and Daniel M. Sutko, in their introduction to *Digital Citiscapes: Merging Digital And Urban Playspaces*, found that through the mobile interface, location-based mobile games had the ability to reimagine the space of play— what Juhann Huizinga referred to as the “magic circle”—and could transform the city into a game board and present players with “unprecedented ways of exploring and navigating urban *and* digital spaces” (3,1). *Botfighters*, for instance, the first commercially available LBMG which was launched in Sweden in 2001 by It's Alive Mobile Games AB!, had users, represented by robot icons on a map, locate

other players and battle their “bots” with geolocated text messages.¹³ This pervasive game made every street corner a potential battle ground and every passerby a possible opponent. Other projects, such as *Mogi* (2003),¹⁴ a precursor to *Pokémon Go!*¹⁵ popular in Tokyo, geolocated digital objects throughout the environment which the user would search for as they travelled through an area. In each case, interweaving the digital and physical led participants to reimagine their surroundings in playful ways, encouraging them to travel on unfamiliar paths, visit new locations, and explore hidden worlds that their mobile devices could make visible. As Michel De Lange notes, although a player’s location in the physical environment is essential to LBMGs, it is their constant movement between the digital and the physical that defines their gameplay. For him, the joy of these games was experiencing this hybridity and the resulting “uncertainty of what actually belongs to either world” (56, 61).

Location-Based Mobile Narratives

The second group of projects, Location-Based Mobile Narratives (LBMN), use geolocation to attach stories told using text and multimedia to physical locations. At their most basic, these stories direct users through a predetermined sequence of locations in order to advance a storyline. *The Glitch Project*, for instance, a 2011 “mobile media fiction narrative,” invites users to follow a character named Alice across the University of Maryland campus in order to reveal the source of several recent abnormal occurrences. For this narrative to unfold as designed, users are guided to sites of interaction where new story content and clues leading to the next destination are revealed.¹⁶ In addition to these more linear approaches, many LBMNs also embrace experimental narrative structures. *Textopia*, for instance, developed by Anders Sundnes Løvlie, takes user-submitted texts and geolocates them throughout the city of Oslo. Users of this project are able to choose which locations they visit, the narratives they wish to

¹³ de Souza e Silva, 2006, p. 266.

¹⁴ Christian Licoppe & Yoriko Inada. “Emergent Uses of a Multiplayer Location-aware Mobile Game: the Interactional Consequences of Mediated Encounters.” *Mobilities*, vol. 1, no. 1, 2006, pg. 39-61, doi: 10.1080/17450100500489221.

¹⁵ de Souza e Silva, Adriana. “Pokémon Go as an HRG: Mobility, Sociability, and Surveillance in Hybrid Spaces.” *Mobile Media & Communication*, vol. 5, no. 1, Jan. 2017, pg. 20–23, doi:10.1177/2050157916676232.

¹⁶ *The Glitch Project: A mobile, alternate-reality narrative based at the University of Maryland.* glitchproject.blogspot.com/.

explore at each site, and the order and duration of their experiences. Ultimately, the meaning derived from each person's experience is unique and informed by the choices they make.¹⁷

Despite their differences in form and content, each of these projects seeks to forge connections between the narrative and physical place, either building off of this relationship or subverting it in some way. When successful, they are able to create powerful experiences of place that resonate with us on a personal level. As Jason Farman finds in *The Mobile Story: Narrative Practices with Locative Technologies*, “readers of these stories can stand at a location, access the stories about that site, and gain a deep connection to that space (and the various histories of that space)” (6). It is this embodied experience of the narrative that alters our understanding of its content and the places in which it is situated. In addition, as we transition from one location to another over time experiencing these narrative moments, we begin to create connections between sites of interaction that allow us to continue expanding and exploring that meaning. For postmodern literary critic Katherine Hayles, it is an active process of meaning making that has the ability to turn the reader into an active participant, converting the page into a “complex topology that rapidly transforms from a stable surface into a ‘playable’ space” (2008 12-13).

Although these two main groupings of projects are a useful starting point for understanding the types of location-based mobile experiences which have been developed, it is important to note that, although narrative and gameplay are often considered separately, a large cross-section of these projects combine aspects of both. Digital media scholar Bryan Alexander, for example, explored the “storygames,” a category of projects which present users with “small chunks of story content on the go” that could be consumed in short bursts during the “interstitial” moments of daily life such as waiting in line or travelling on mass transit (197, 194). Instead of trying to maintain these distinctions, the use of the umbrella term LBME embraces this full spectrum of projects, uniting their diverse approaches and objectives by placing an emphasis on the user's experience at place. It is through this lens that we begin to detail the important aspects of LBMEs that inspired *Vanishing Leaves*, paying particular attention to models and methods that invite us to interact and explore places in new ways, that make their embedded histories visible, and that provoke us to examine our own relationship and connection to locations.

¹⁷ For more on *Textopia* see Souza e Silva & Firth, pp. 45-46.

Key Aspects of LBMEs

Connecting to Place

One of the key properties of LBMEs that this project looks to leverage is their ability to connect users to place and deliver important information relevant to those sites through mobile devices. By geolocating historical data, primary source materials, and multimedia at these locations, learners are able to engage with content where it is relevant, creating opportunities for powerful personal encounters with the embedded layers of human and natural history. Jason Farman noted that mobile devices possess the unique ability to access and bring forward the qualities and history of place, with what he refers to as its “site-specificity,” in order to generate meaningful learning experiences: “there is value in standing at the site where an event took place; far more than simply reading about an event, being in the place where that event happened offers experiential value that gives us a deeper sense of the story and the ways that story affects the meaning of place” (2014 3, 7). In considering the development of place-based learning experiences with mobile, Litts, Gagnon, et al., in their work “Mobile Technologies, Learning, and Play: Connecting Theory to Design,” noted these projects “ground learners’ conceptual understanding in the physical world,” situating content where it is most meaningful (4). Building off of the work of embodied cognition (Goldstone, Landy & Son, 2008; Barsalou, 2009) and situated learning theories (Brown, Collins, & Duguid 1989; Lave & Wenger 1991), they observed the importance of “getting learners out into the world” where educational activities and experiences could be built into “real-world contexts and situations” (2). One of the first LBME projects, Jeremy Hight’s *34 North 118 West*, sought to capitalize on the use of contextual information and place-based learning by having users move through an abandoned freight depot in Los Angeles in order to trigger geolocated narrative elements and historical information related to specific areas of the site. Using the term “narrative archeology,” Hight saw his project as a way to explore the layers of a physical landscape augmented with digital information, resurfacing its unseen history in order to discover the “multi-layered, deep and malleable resonance of place” fused to the landscape (1-2). Agitating the “lost layers of time into being in the present in collusion or juxtaposition as selected,” users were able to experience the voices and stories of those who had inhabited the landscape around them, forming a link between the present and the past in a manner that produced a sensation of “being

aware of two places at once” (5). For instance, passing by a neglected storage facility, users hear the voice of a Latina worker from the 1940s who, standing at the same spot, describes her view of La Grande Station, the once bustling train terminal in Los Angeles which was demolished in 1946 after an earthquake damaged the structure. At another point, while looking upon the remnants of a train line partially covered by asphalt, users hear a railroad worker charged with cleaning corpses from the tracks recount the horrors of his occupation. As the user continues to explore the location, a process which Hight refers to as the “reading” of place, each additional story further reveals the depth and complexity of the location’s history (2). Through this shared ground, an intimate and immediate connection is formed between the past and present that brings into conversation their many differences and commonalities, draws attention to the ever-changing nature of physical place, and helps shape the user’s understanding of their place in the continuum of events that have occurred and will continue to transpire at these sites.

The *Fort Vancouver Mobile* (FVM) project,¹⁸ launched in 2012, provides another excellent example of a LBME employed to connect users to the embedded histories of a location. Built around a collection of modules addressing important moments and historical figures from the Park’s past, this app provides multiple entry points and narrative experiences for the user to choose from as they explore the grounds. One of the modules, “Kane’s wanderings,” leads users to locations related to the nineteenth-century Canadian artist Paul Kane. At each destination throughout the experience, geolocated historical information and multimedia help the user better understand the life of the painter, his connection to the park, and the land’s influence on his work. In addition, by viewing geolocated images of Kane’s landscape paintings on their devices, viewers can align his depictions of notable sights, such as Mt. Hood and the Columbia River, with the actual landmarks, helping to reveal the dramatic changes to the landscape which have occurred since Kane’s time. Another module, “Kanaka Village,” uses geolocated archival documents and historical reenactment videos to bring to life William Kaulehelehe and other Hawaiian workers at the Hudson Bay Company’s fur trading headquarters. In discussing their project, Brett Oppegaard and Dene Grigar noted the ability of mobile devices to “open new portals for rediscovering the forgotten, yet illuminating, stories of our shared history.” Through historical storytelling, conveyed through mobile devices and geolocation, they detail how their application “makes explicit what is implicitly

¹⁸ For more on the *Fort Vancouver Mobile Project*: <http://fortvancouvermobilesubrosa.blogspot.com/>.

embedded in the local landscape,” conveying the significance of the location as well as the many forgotten stories of those who once inhabited the land (19, 21). Triggered by the user’s movements, these voices from the past and their forgotten stories seem to emerge from the landscape, transforming the environment from a passive background into a responsive actor in the unfolding experience of the user. Place theorist David Gruenewald, in his article “Foundations of Place: A Multidisciplinary Framework for Place-Conscious Education,” found that place often “recedes from consciousness as we become engrossed in our routines in space and time” (622). With this in mind, and in order to better understand “human–world relationships,” he argues that we must “first acknowledge that places themselves have something to say. Human beings, in other words, must learn to listen (and otherwise perceive)” (624). LBMEs offer just such an opportunity for users to pause and listen to the world around them. The perspective gained through this exercise helps us to understand the ways in which place, often in subtle and unseen ways, act upon us and shape our voice and personal stories.

Reexamining Place

As seen in *FVM* and *34 North 118 West*, one of the unique potentials of LBMEs is their ability to transform our everyday, ordinary surroundings through innovative approaches, infusing the familiar with new meaning. As Adriana de Souza e Silva and Eric Gordon note, location-based mobile projects have a remarkable ability to let us see our surroundings with the “eyes of a tourist,” leading us to become increasingly aware of the everyday spaces that we normalize overtime (72). Rita Raley, in examining Susan Huang and Brian House’s *Hundekopf*,¹⁹ a project which pushed narrative elements through SMS text messages as users arrived at specific locations on Berlin’s Ringbahn train line, found that locals were playfully navigating the city with a renewed attention to the places they had frequently travelled. These “tactics of defamiliarization,” as she describes them, helped to destabilize preconceived notions of place by inviting users to become participants in a process of discovery and exploration, of “improvisation and experimentation” (307). In *San Francisco <-> Baghdad*, Paula Levine takes this a step further and actively attempts to generate a sense of dislocation and contradiction at familiar places, what she calls “spatial dissonance” (144). In her work, Levine transposes the locations of the US attacks on Baghdad in 2003

¹⁹ <http://knifeandfork.org/hundekopf/>.

onto the streets of San Francisco by overlaying street maps of the two cities. At each of the locations in San Francisco, a geolocated container, or geocache, was placed with information about the attack at the corresponding location in Baghdad which users discovered using their GPS enabled devices. Throughout the experience, users navigated the streets of San Francisco as they normally would, yet when they reached one of the sites Levine designated, they would be confronted with the violence and destruction of war occurring at distant locations. In each instance, the user is forced to reexamine the structures, vehicles, and people surrounding them, contemplating how such an event would impact their lives and city. Levine found that by collapsing these seemingly disparate and distant locations and events, she could create “empathic narratives” that allowed a user to identify and connect in some way with the experiences of another person (143). In order to create connections to Walt Whitman’s history in a neighborhood that has been radically redeveloped since his time, Levine’s empathic narratives and Raley’s tactics of defamiliarization offer provocative methods for bridging the distant past and the present.

User Interaction

Beyond accessing information and media which has been linked to places, LBMEs also allow users to upload and connect their own content to places through geolocation, creating opportunities for participation and a method to stimulate user investment. This practice, also referred to as geotagging, is commonly used on social media platforms where user posts are linked instantly to the locations where they are created, or afterwards through location-specific tags. These compositions, aside from serving as records of our personal experiences, reveal how places inspire and impact us, and document our emotional and creative responses to them. In addition, through the curation and presentation of our observations, insights, and reflections from particular locations, we regularly negotiate the relationship between place, discourse, and our identity. Many early mobile projects such as *[Murmur]* (2003),²⁰ *Digital Graffiti* (2005), *MScape* (2005),²¹ and *Bliin* (2007)²² sought to leverage user-generated geolocated content as a critical entry point for participation. One of the first geo-tagging projects, *Urban Tapestries*, made by Proboscis in 2002, asked users to create “virtual annotations of the city” by uploading their

²⁰ For more on *[Murmur]* see Ritchie, p. 57.

²¹ For more on *Digital Graffiti* and *MScape*, see de Souza e Silva, 2011, p 51.

²² For more on *Bliin*, see De Lange, pp. 57-59.

personal multimedia stories to locations. It was through contributing these experiences to the platform, an act the group refers to as “public authoring,” that users were able to explore a “fundamental human desire to ‘map’ and ‘mark’ territory as part of belonging and of feeling a sense of ownership of our environment” (Lane and Thelwall). Malcolm McCullough, in contemplating emerging practices of, “mapping, tagging, linking, and sharing,” felt these acts were capable of expanding “both the possibilities and participation in urban inscription.” This interaction, what he termed *urban markup*, held the ability to transform the “privileged reader into an active tagger, an embodied interpreter, and at some level, and with some unstudied degree of access and duration, also a cultural producer” (2008 61). In LBMEs, this shift from reader to active producer offers tremendous promise for introducing user agency into projects.

Opportunities to write to the landscape, to reflect and respond, and to leave some lasting record of one’s experience at locations move beyond the passive study of subject matter toward a more immersive and personal encounter with place, one that requires an investment of thought and a willingness to share with others. In discussing *Bliin* (2007), a Dutch platform which has users “geotag” texts and images, Michel De Lange notes that participants no longer passively experience the places they move through. Instead, they are “empowered to inscribe their subjectivities in the city itself” (63). Through this process, he adds, we discover that “almost every place is suffused with human experiences and stories,” and that places are “constituted through generations of collective and sedimented memories” (67). When we actively place our personal compositions into conversation with those of the past through geolocation, we make visible our inseparable link to the ever-growing accumulation of stories and memories already intrinsically linked to the site. As humbling as it is inspiring, this awareness opens a space to consider our own voice in a larger context, creating an opportunity to contemplate the varied impact of place on individuals through their diverse expressions and how those discursive acts may have in turn shaped the fabric of the location.

Mobility

Finally, in exploring the essential characteristics of LBMEs, one of the most important and promising aspects for this project is how they are able to leverage an individual’s mobility, as well as their natural and continual interaction with their mobile devices during those movements, to sustain

experiences across multiple locations over time and to cultivate connections which help better understand each individual site and its function or role within larger networks and narratives. Mimi Sheller and John Urry, contemplating what they understand as an emerging mobilities paradigm, found that through a global increase in individual mobility, which has been driven in part by mobile technologies, we have become increasingly aware that “all places are tied into at least thin networks of connections that stretch beyond each such place and mean that nowhere can be an ‘island’” (209). Adriana de Souza e Silva and Jordan Firth, in their article, “Re-narrating the City Through the Presentation of Location,” similarly found that locations were “relational” and not “isolated entities.” Their meaning was instead derived through their actual and perceived connections to other places (36). For de Souza e Silva and Firth, location-aware projects held the potential to tie together “fragmented locations,” physically manifesting the spatial metaphor of a hypertext as the user moved and experienced “information as spatially distributed through a physical location and the narrative as constructed by their personal spatial trajectory” (42, 45). As LBMEs stretch across multiple sites, determining the connections between locations, the manner in which these links unfold, and the degree to which the user is given agency in that process, are all instrumental in shaping the meaning and character of the experience. In projects such as *34 North 118 West*, users have a great deal of freedom in generating meaning based on their decisions, interests, and movements. Although the designated sites of interaction and the content at each are predetermined, the number of locations the user interacts with and in which order they are approached is entirely up to them. Hight felt that projects with nonlinear structures, such as his, made the “ultimate end-author” of the experience the “movement and patterns of the person navigating the space”(3). For him, travelling through the landscape was “comparable to a conversation,” an ongoing dialogue between the individual and the environment which presented “ample potential for expansion of the levels of complexity and fullness of experientially-driven locative media” (7).

Mientras, created by Christopher L. Holden & Julie M. Sykes using the ARIS (Augmented Reality Interactive Storytelling) platform, takes a slightly more structured approach to the user experience. In this project users are guided to six destinations in the Los Griegos neighborhood of Albuquerque where they

attempt to solve a fictional prohibition-era murder.²³ At each of the project's locations, such as the local church and cafe, users discover clues and interact with game characters who provide them with information regarding the crime being investigated as well as the site's historical significance. Although each place has individual importance to the narrative and the local community, it is only through the aggregated first-hand encounters and cumulative information gathered at these locations that the user is able to draw them into conversation with one another and begin forming relationships between them. As opposed to the free-form experience of *34 North 118 West*, *Mientras*'s defined scope, narrative sequencing, and limited sites of interaction all assist the user in making connections, accomplishing the project's goals, and arriving at its intended meaning.

Designed as a Spanish language learning game, another important goal of *Mientras* was to provide users with an opportunity to be immersed in the language and culture of the neighborhood they navigated, giving them a more intimate experience of the community through sustained and direct contact with it. In embracing the user's organic experiences outside of the structured elements of a project, the learning moment is extended to include their pathways and interactions as well as their ruminations and reflections on past and future experiences. In their work on LBMNs, "Interrelationships of Mobile Storytelling," Dene Grigar and Brett Oppegaard note the importance of the "action that takes place between the media," what they refer to as "intermediality," and how it acts as an adhesive binding together the "swirling mix of ideas inherent in an environment that includes otherwise unconnected media, delivered through mobile devices as well as the physical sensations of the place" (17). Ultimately, these interstitial moments and movements are essential in breaking down the perceived distinction between individual locations and experiences. As Adrian Mackenzie notes in his book, "Wirelessness: Radical Empiricism in Network Cultures," experience is "immersed in shifting settings or sites." He evokes 19th-century philosopher William James's radical empiricism as a way to think through this constant change and the transitions, arrivals, and departures which are intrinsic to our modern interactions with mobile devices: "Experience is composite, diverse, inclusive of things and thinking, because it owes more to transitions and tendencies than to endpoints" (20). It is this shift in thinking, the recapturing of the

²³ For more on *Mientras* see Holden, Christopher L. and Julie M. Sykes. "Leveraging Mobile Technologies for Place-Based Language Learning." *International Journal of Game-Based Learning*, vol. 1, no. 2, pp 1-18, 2011, <http://dx.doi.org/10.4018/ijgbl.2011040101>, Accessed 1 April 2019.

moments between that helps us expand our understanding of experience, and the ways in which we form meaning and connections over time.

LBMEs are perfectly suited to deploy a more inclusive and holistic understanding of experience and meaning-making, one that appreciates them as ongoing, dynamic, and personal processes. As Mike Sharples et al. found, learners are “continually on the move,” and by placing “mobility of learning as the object of analysis,” we begin to see how knowledge and skills are transferred from one context to another and become aware of learning as a “labile process of ‘coming to know’ through conversation in context” (2). In *Dow Day*, an LBME built on the ARIS platform by James M. Mathews, users play the role of a reporter for the *Wisconsin State Journal* charged with investigating the student protests against Dow Chemical that occurred on the University of Wisconsin–Madison campus during the Vietnam War in 1967.²⁴ As they travel to locations around the campus to gather information, interactions are triggered with different characters, such as the Dean of Students and a Dow representative, who provide important insights and historical resources related to the protests. Users are also prompted to examine their surroundings and note the role that physical place played in the events. Through this experience, users are engaged in a creative process that requires their sustained effort and contemplation across multiple sites of interaction over time. Each viewpoint, site visit, and piece of information is critical in developing a well-informed and nuanced grasp of the event, an understanding which the user must then distill and make coherent in the newspaper article they compose after the conclusion of their field research. In the end, *Dow Day* not only leads the user through a powerful place-based learning experience that exposes them to the complexity of an important local historical moment, but also uses the investigative journalism methodology central to its structure to extend the meaning-making process beyond the game.

²⁴ For more on *Dow Day*, see Squire, K.D., Jan, M., Mathews, et al., 2007.

Interlude: Whitman online

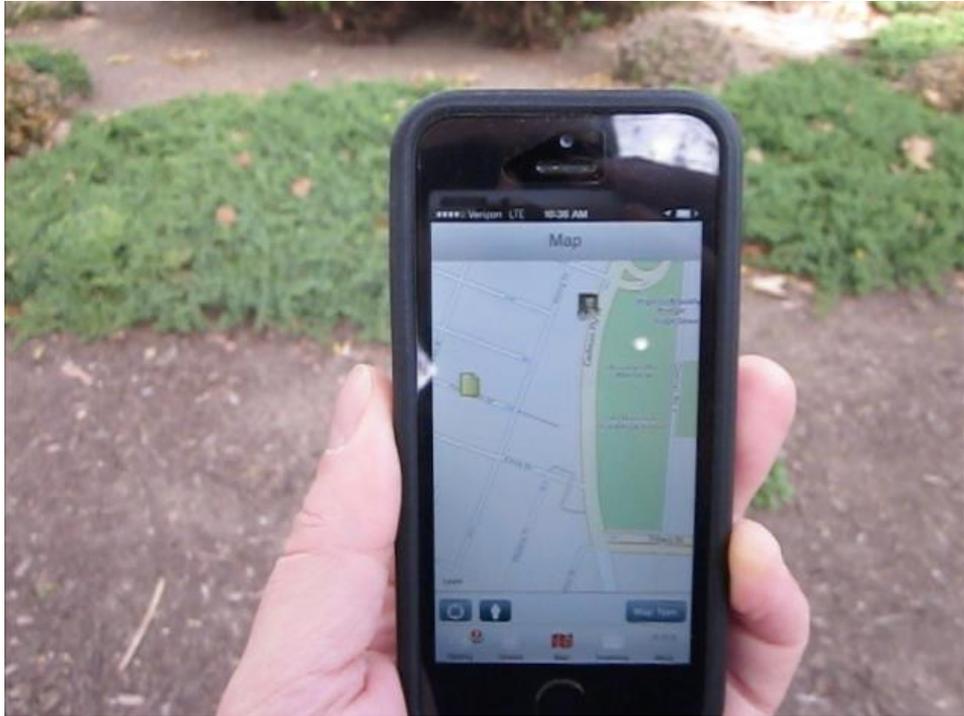


Fig. 4. Brooklyn Heights: Testing in the Field. Photo: Jesse Merandy

Fail 1: The day had finally arrived. After months of development and research, I was ready to bring *Vanishing Leaves* out to test in the field. Emerging from the subway, I went into my phone and launched the game, watching impatiently as it loaded. Finally it opened and there on the game's map interface marking my location was a small glorious pulsing blue dot. That blue dot was my story, work, and research manifested, it was my tribute to Whitman, and it was all of the potential future scholars and learners who might connect to Whitman and Brooklyn Heights through my efforts. On the map, another marker had also dropped for the first destination of the game, Walt Whitman Park, and as I began to walk towards the location, I watched as my icon's movements in the digital world corresponded with my own. My excitement built as I neared my destination, the warm summer sun punctuating the clouds to mark the occasion. I reflected how much had changed around me since my first visit to the park. The once-neglected area had been reimagined and now featured a water fountain surrounded by Whitman quotes. Children were running through the water to keep cool as families sat on benches nearby watching. A man

walked a small dog who spun excitedly after coming too close to one of the fountain's small spouts. Looking down at my phone, I realized that I was finally able to tap the icon on the screen and initiate the first interaction of experience. Even though I had written the introductory text which introduced users to their character and objectives, I read through the information as if it were the first time I had ever encountered it. At the conclusion of the sequence, I tapped the button on the screen to exit and waited for the next destination icon to drop for the Rome Print shop, but nothing happened. There was my blue, pulsing dot on the map and nothing else. I quickly restarted the program, hoping for a simple fix, but after clicking through to the same point nothing had changed. Uncertain what the issue was, and with no way to fix the issue out in the field anyway, I walked back to the subway, following my little blue dot until I went back underground.

Fail 2: After multiple failed trial runs over the next few weeks, and several somber train rides from Brooklyn Heights back home to Spanish Harlem, I discovered a development mode for the ARIS platform which made it possible to test the full experience without being physically present at the location where it was designed to take place. I sat quietly, did some introspection, worked through my self-loathing, and finally rejoiced at this fortuitous development! With a game experience that was going to take nearly 2 hours to complete, I could now test every trigger and complex interaction without leaving the comfort of my desk. The next time I ventured out to do a field test, I was determined that everything was going to work perfectly. When that day finally came, I began as I had so many times before at Whitman Park. Each partial run had helped me refine the project and correct technical issues, but I still need to experience the work in its entirety in order to gauge the overall effectiveness of the narrative and the physical demands which would be required of users. Cautiously optimistic, I began to work through the storyline, travelling across Brooklyn Heights and becoming more invested and excited with each successful interaction and conversation. Finally, I arrived at the final destination. Looking down Fulton Street, I gazed upon the Fulton Ferry Landing, the very place that had launched my project years ago and that now represented the finish line. Making my way to the pier, I once again held the railing, this time the sun warming the metal and dancing on the scalloped waves of the East River. The area around the landing had been completely transformed from my first trip and was now a green space filled with people lounging on the

grass, eating food from the various vendors, and waiting to board the ferry pulling into a nearby pier. As I imagined how excited Whitman would feel about the revitalized waterfront and the restoration of the ferry service, I looked down at my phone screen again and felt like everything was finally in its right place. On the screen I followed the prompts to complete the final task of the game: record yourself bellowing a “Barbaric Yawp” in honor of Whitman. And boy did I yawp that day, drawing puzzled looks from a nearby bystanders. I thought to myself, “This one’s for you, Walt,” clicked the button to submit the file, and waited for the final screen congratulating me on completing the game. But there was no message, no gratification, just a *blue pulsing dot*. Like the period that fell off of the handset press during the first printing of *Leaves of Grass*,²⁵ my location marker on the map stubbornly remained. I couldn’t help but feel like Whitman was somehow watching right now, having a great laugh at my misfortune.

Game Development and Lessons Learned

As textual scholar Jerome McGann stated, “The next generation of literary and aesthetic theorists who will most matter are people who will be at least as involved with making things as with writing text.” For him, using books to study books limited the potential of the investigation “to the same conceptual level as the materials to be studied.” He saw approaches that incorporated digital tools as way to not only gain new perspectives on texts, but as a way to “lift one’s general level of attention to a higher order” (19, 82, 55). Amy E. Earhart and Andrew Jewell similarly found that using the digital to manipulate scholarly materials allowed scholars to perceive them in new ways and could “bring into focus qualities of studied texts and objects we have never before ascertained” (3). *Vanishing Leaves* is an attempt to employ the digital, and specifically mobile technologies, as a means to engage Walt Whitman and his work in an active, experiential, and personally meaningful way. Through this Location-Based Mobile Experience (LBME), I endeavor to illuminate Whitman’s relationship to place and its influence on his writing by putting learners in direct contact with locations throughout Brooklyn Heights connected to the Poet. At each of these sites, project users are exposed to Whitman’s history and work and at the same time, through the

²⁵ For more on the missing period in the 1855 edition of *Leaves of Grass*, see Ed Folsom’s “The Census of The 1855 Leaves of Grass: A Preliminary Report,” <https://whitmanarchive.org/criticism/wwqr/pdf/anc.00975.pdf>.

incorporation of mobile composing exercises, they are encouraged to think about their own relationships to place and its impact on their composing practices. Blending narrative and gaming, this project offers a creative, experimental approach to learning intended to engage and inspire its users. It is an exploration that extends beyond the classroom and outside standard methods of literary study, intended to be used and enjoyed by a wide variety of literary scholars, poetry enthusiasts, and Whitman fans. This section of the white paper details the creation of this project, its major features and the rationale behind them, as well as some of the challenges and lessons learned throughout the development process.

Project History

The *Vanishing Leaves* project is the culmination of over a decade of work creating Digital Humanities projects connected to the poet Walt Whitman. At the core of each of these projects has always been a desire to use digital media and technologies as a way to create personally meaningful methods to explore Whitman and his writing. Starting with my tenure as managing editor of the *Mickle Street Review*, an online Whitman and American Studies journal,²⁶ from 2003 to 2005 and through my Master's thesis [Whitman in Cyberspace](#),²⁷ completed at Rutgers-Camden in 2005, I became extremely interested in web-based interventions that employed the associative properties and decentralized structure of hypertext as way to represent Whitman's democratic vision and provide a user-driven approach to studying his work. I continued this pursuit in [The Crossing Brooklyn Ferry Online Critical Edition](#),²⁸ a web-based critical edition launched in 2008, which explored one of Whitman's most popular works through three distinct approaches: a [Close Reading section](#) that provides links to criticism, commentary, and multimedia resources throughout the poem; an [Edition Evolution section](#) that tracks the changes Whitman made to "Crossing Brooklyn Ferry" throughout his lifetime; and an [Edition Comparison](#) that gives users the opportunity to look at different versions of the poem side by side. Built with an HTML backend, this project linked together a myriad of critical methods and resources in order to provide

²⁶ For my work on Mickle Street Review, see Issue 19/20: msr-archives.rutgers.edu/index.htm and Issue 17/18: msr-archives.rutgers.edu/archives/Issue%201718/index.html.

²⁷ Link to Thesis: msr-archives.rutgers.edu/archives/Issue%201718/pages/Scholarship/Merandy.htm.

²⁸ Link to *The Crossing Brooklyn Ferry Online Critical Edition*: msr-archives.rutgers.edu/CBF/index.html.

- Close Reading: msr-archives.rutgers.edu/CBF/closereading/closereading.html.
- Edition Evolution: msr-archives.rutgers.edu/CBF/evolution%20page/evolution.html.
- Edition Comparison: msr-archives.rutgers.edu/CBF/Comparison%20page/comparison.html.

multiple entry points for users to interact with the work. In 2009, building off of *The Crossing Brooklyn Ferry Online Critical Edition*, I completed [Walking with Whitman](#),²⁹ a downloadable walking tour inspired by emerging mobile technologies and the popularity of podcasts and downloadable audio tours.³⁰ This project provided users with a printable travel packet and map which guided them to destinations in Brooklyn Heights connected to Whitman. At each of these locations users were prompted to listen to audio recordings of Whitman poems which they had downloaded onto an MP3 player. Although rudimentary, this project illustrated the great potential of mobile devices for deploying placed-based learning experiences that incorporated location-based media and information.

Shortly after finishing the *Walking with Whitman* project, mobile technologies underwent a period of rapid advancement. With the substantial hardware improvements and added functionality, particularly high-speed wireless internet and GPS integration, new possibilities emerged for mobile learning. In 2013, I began work on *Vanishing Leaves*, researching potential platforms that would allow me to expand on the *Walking with Whitman* project and leverage personal mobile device advancements to create a Location-Based Mobile Experience.

The Tech

ARIS (Augmented Reality Interactive Storytelling)

Vanishing Leaves was built using ARIS (Augmented Reality Interactive Storytelling), an open-source platform developed at the University of Wisconsin-Madison for the creation of augmented reality experiences including mobile games, interactive narratives, tours, and data collection exercises.³¹ Launched to the public in 2010, the platform includes three central components: a web-based editor used to create the user experiences; an app which users download to access those experiences; and a cloud-based server which manages the game assets and user-created content. With a scarcity of tools available in academia for the creation of mobile learning experiences, the ARIS ecosystem proved to be a

²⁹ Link to *Walking with Whitman*: msr-archives.rutgers.edu/CBF/walking%20tour/index.html.

³⁰ For more on this project see: tpis.commons.gc.cuny.edu/2009/01/17/walking-with-whitman-an-independent-study-project-by-jesse-merandy/.

³¹ For more on ARIS, see Gagnon, David. "ARIS: An open source platform for developing mobile learning experiences." 2010.

perfect solution for multiple reasons. First, with a back-end infrastructure already in place, there was no need for application or software development, which kept costs low, saved time, and allowed me to focus on content creation and implementing learning goals. In addition, the robust and intuitive web-based editor provided a great deal of flexibility, allowing for a high level of customization and complexity based on the desired outcomes of the experience. One of the key features of the editor that was central to the project was a map interface which made it possible to geolocate information, media, and events at specific locations and control the deployment and access of that content through triggers activated by the user's GPS coordinates. The second major feature of the editor was a conversation builder and scene editor which facilitated the creation and organization of intricate narrative sequences and engaging interactions with game characters. Finally, for the end user, ARIS only required an iOS device with internet and GPS capabilities to get started. Once the application was downloaded onto the device, the simple design, clean organization, and familiar graphic elements, such as the map interface, dramatically reduced the learning curve and allowed users to jump in without lengthy instructions. The app interface also gave users the ability to create, store, and geolocate content through a notebook tool which became instrumental for inviting and implementing user engagement.

Companion Website

In addition to ARIS, a companion website using WordPress serves several critical functions for the game. First, during gameplay, the website stores the media and longer texts which are delivered to the user throughout the game. Offshoring the content allowed it to be presented through the built-in ARIS web browser, freeing up design possibilities and features such as embedded media players. The website also makes those assets available outside of the application for those who wish to access the content after they have completed the experience. This was particularly useful for the lengthy passages of historical information which the player may not wish to read through during gameplay and as a way to provide pathways to additional online content and resources outside of the project. Finally, the companion website provides a central repository for critical project information, such as instructions for use, equipment requirements, and this white paper as a resource for scholars and educators looking for insights into the project's theoretical foundation, development, and future.

Technological Shifts and Sustainability

As I was completing the project in 2016, the ARIS platform underwent a major upgrade, leaving behind its Flash-based editor for a Javascript version. This new editor offered significant improvements, including a redesigned interface that simplified narrative organization and management, new tools and features, and a more stable backend. Although the game I had built was rolled over onto the new platform, issues occurred during the transfer that required revisiting the project in detail again. As I began working on the enhanced editor, I found myself reimagining the narrative through the affordances of the new platform. In many ways, this was beneficial to the project and led to exciting new directions, but it also was a reminder of the serious sustainability issues projects built using emerging and experimental technologies face. Aside from the components of the ARIS platform, *Vanishing Leaves* relied on network of interdependent technologies to function, including server hardware, database programs, GPS and cellular infrastructures, and mobile device hardware and software. Accounting and planning for changes to these multiple variables so that future learners and scholars would be able to access and benefit from my work was a simultaneously critically important and daunting task. Further reinforcing the gravity of the issue and unlikely prospect of preserving these works in perpetuity “as is,” many of the LBMEs featured within this white paper have already become inaccessible. Still, even if these projects were transitional or temporary, they each served as important models and inspiration for the development of my work, and fortunately their legacy had been preserved through articles and documentation provided by their makers.

With this in mind, I worked towards a multi-prong approach to archiving and preserving *Vanishing Leaves* in coordination with CUNY Graduate Center’s library archive specialists Stephen Klein and Roxanne Shirazi. First, we preserved a copy of the frontend of the ARIS application and the backend source code for the editor, both of which are publically available through Github as well. Information pertaining to the technical requirements and installation procedure for these components was also documented. Second, a download of the *Vanishing Leaves* database preserved all of the content created on the platform, including the project’s interactions, conversations, and assets. In addition to these archive components, the companion website, which contains this white paper, all audio files, mission files, gameplay instructions, and a text version of the game script, was crawled using WebRecorder. Finally,

screenshots and videos of the *Vanishing Leaves* project were created to document the gameplay experience.

In developing any Digital Humanities Project, the archive and preservation of the work should be considered early and thoroughly integrated into the project plan. In addition, that plan should be revisited throughout the development process should any changes occur which alter it in any way. Even with these efforts, it is still possible that in twenty years this project will no longer be “playable”; however, I hoped that the steps I have taken will preserve the essence of the work well beyond its obsolescence.

Setting the Course

Whitman lived, worked, and wrote in Brooklyn Heights for nearly forty years between 1823 and 1862. However, as a result of redevelopment and landscape-altering public and private projects, few remnants of the 19th-century neighborhood Whitman once knew remain. Through my work on the *Crossing Brooklyn Ferry Online Critical Edition* and the *Walking with Whitman* projects, I had conducted extensive research on Whitman’s history in Brooklyn Heights and was able to identify multiple sites with connections to the Poet and his work. The core of these selections had direct relevance to Whitman, but I also expanded the list of sites to include locations such as Walt Whitman Park, which lacked historical links to the poet, but still possessed engaging present-day connections.

After mapping these locations, I began plotting potential pathways between them, devising routes which would lend themselves to a narrative flow and serve as a framework for the game experience. Based on this preliminary work, I began a series of site visits which allowed me to further refine the rough route I had mapped and also gain a better understanding of the time commitment and physical exertion that would be required to complete the experience. As Jeff Ritchie details in his work on LBMNs, these projects require a substantial mental and physical effort from their audience. For users to remain fully engaged throughout the experience, he found their perceived effort must not exceed the rewards of participation, a balance which he refers to as the “Narrative Value Threshold” (54). Keeping this in mind, I began closely assessing the terrain at each destination and the paths between them, noting any areas that might be physically demanding or difficult to navigate. I also identified locations where users could rest, read, and write safely. It was important for me to create an active experience, one that celebrated

Whitman's love of walking and his passionate engagement with place, but I also wanted to accommodate a user-base with a potentially wide spectrum of fitness levels and physical abilities. Making the route manageable, building in stops and moments for reflection, and gauging the scope and pace of the experience were all key in realizing a balanced and enjoyable experience.

Game Locations

Following is a list of the final locations selected and the order in which they are visited:

- **Walt Whitman Park:** A newly renovated space in Cadman Plaza Park featuring a fountain with four excerpts from Whitman's poetry.
- **Rome Print Shop:** Former site of the print shop where Whitman published the first edition of *Leaves of Grass* in 1855.
- **Plymouth Church:** One of the few surviving nineteenth-century structures in Brooklyn Heights. The church and its pastor Henry Ward Beecher played a key role in the Abolitionist Movement and were known by Whitman.
- **Brooklyn Promenade:** With iconic views of Manhattan, the East River, and the Bays, this stretch has long been a favorite walking spot in Brooklyn Heights and one that Whitman advocated to preserve in his journalism.
- **Granite Prospect:** The current site of the "Song of Myself" marathon held yearly in honor of Whitman's birthday.
- **Eagle Warehouse:** The former site of the *Brooklyn Daily Eagle* where Whitman served as the editor between 1847-1848.
- **Fulton Ferry Landing:** Site of the Fulton Ferry Landing which Whitman frequently used to travel between Manhattan and Brooklyn. The renovated pier features an excerpt from Whitman's "Crossing Brooklyn Ferry."

Changing Place

Brooklyn Heights has always been a place of flux. From its rapid growth in the mid-nineteenth century to Robert Moses's dramatic urban redevelopment projects in the 1940s and 1950s, change has

always been fundamental aspect of the historic neighborhood's identity. Today, with projects such as Brooklyn Bridge Park project, those changes continue to reshape the landscape and alter its character. One of the greatest challenges of building *Vanishing Leaves* was responding to these ongoing and sometimes unexpected changes which considerably altered the direction and scope of the project.

When I first began researching and prototyping *Vanishing Leaves* in 2009, the Brooklyn waterfront was, with the exception of the Fulton Ferry Landing, a stretch of abandoned and deteriorating warehouses. When the plywood barricades came down in 2010 to reveal a 9.5 acre green space on Pier 1, the face of the waterfront was transformed and people returned to enjoy the land for the first time in over a century. As Editor of the *Brooklyn Daily Eagle*, Whitman repeatedly advocated for additional public green spaces and civic improvements, and considered the foundation of Fort Greene Park to be one of his greatest accomplishments during his tenure there. With this in mind, it seemed appropriate to incorporate the new park into the project as a nod to Whitman and as a way to draw attention to the incredible site and vital new area of Brooklyn Heights. One location that was added to the project as a result of this change was the Granite Prospect located on Pier 1 of Brooklyn Bridge Park. Opened in 2010, this site features a set of steps constructed from over 300 pieces of granite salvaged from the Roosevelt Island Bridge reconstruction and offers exceptional views of the Manhattan skyline. It has also become the site of a yearly marathon reading of "Song of Myself" on Whitman's birthday. This event brings Whitman and poetry fans together to celebrate his important work and life in a setting that, although lacking a historical grounding, still present as a valuable organic connection to the Poet. With so many threads to the past lost over time, this site presented an important counterpoint to that loss and illustrated the lasting impact of the poet and his work and the potential for place to take on new meaning.

Although the neighborhood's changes provided some incredible new angles and opportunities to explore for the project, attempting to incorporate these new changes also proved frustrating and prompted serious contemplation about the sustainability of LBMEs. One aspect in particular, the integration of Squibb Bridge, proved to be particularly challenging.

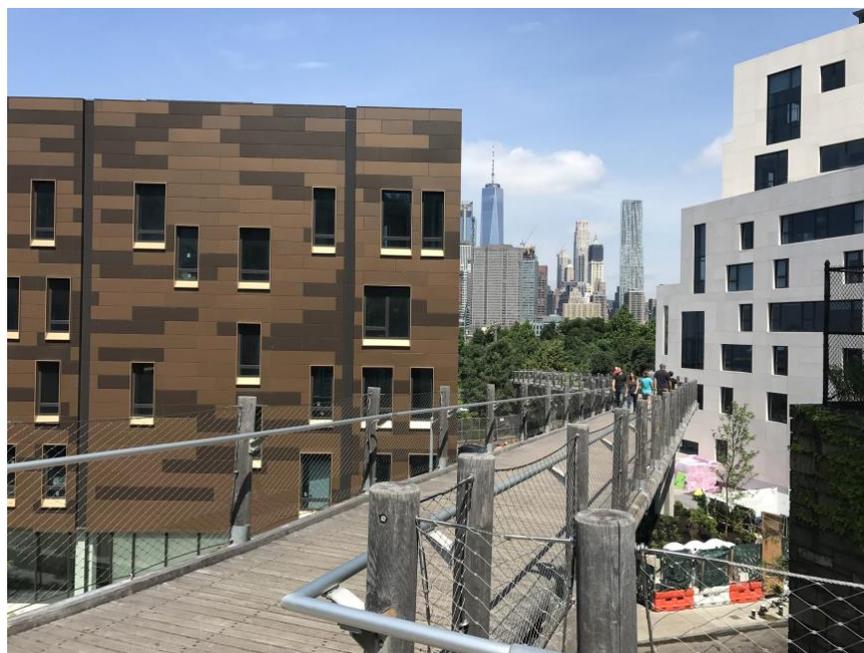


Fig. 5. Squibb Bridge. Photo: Jesse Merandy

In 2013, as part of the Brooklyn Bridge Park project, Squibb Bridge was constructed to connect Brooklyn Heights' famous promenade to the redeveloped waterfront it overlooked. This 400 ft. suspension bridge, built out of black locust timbers, was meant to emulate the trail bridges of our national parks and created an important new link between these two locations which had previously been separated by the natural landscape and the Brooklyn Queens Expressway (BQE). Not only did the structure offer a stunning descent to the waterfront park across the highway and around several buildings, it would also save users the time and effort previously required to circumnavigate the natural bluff down Columbia Street. With these benefits clearly outweighing the need to rework the nearly completed project, I made edits to the script and completed the backend changes necessary to incorporate the bridge into the natural flow of the narrative. I then returned to the site, anxious to test this new element of the experience. It was during this trip that I noticed for the first time that the natural sway of the bridge, which I had found so inviting, was also deterring many people from crossing it. It was clear that despite my enthusiasm for the addition of the bridge, I was going to have to offer an option to those who had trepidations about walking over the wood and wire structure. Instead of removing the bridge however, I reworked the script to offer users a choice between the bridge and the original route. Up until that point, the progression through the neighborhood had been largely predetermined, leaving little room for any user agency in the

outcome of their experience. Even though it was a minor change, this alteration turned out to be a welcome infusion of engagement in the narrative.

Several months later, I returned to Brooklyn Heights to do some additional onsite game testing. Moving out from the quiet streets to the Brooklyn Promenade, I could see the majestic New York City skyline and the Statue of Liberty in the distance. As I received the prompt to choose between the Squibb bridge and the original route to the waterfront, my anticipation grew. The feeling of being suspended above the ground while weaving into the tree line of the park below had quickly made this crossing one of my favorite moments of the experience. Reaching the bridge entrance, I stopped in disbelief. A chain link fence had been erected blocking entry to the structure and a sign hung from it that read “Squibb Park Bridge access is prohibited.”



Fig. 6. Squibb Bridge: Closed. Photo: Jesse Merandy

After contacting the parks department and conducting some research online, I discovered that due to the sway of the bridge, it had become unsafe and now required substantial work to repair and stabilize. With no timeline given for the completion of the work, I begrudgingly revised the project for a third time, removing the bridge crossing and once again directing users down the original route to the waterfront. Finally, in 2017, after a year and \$2.5 million in repairs, Squibb Bridge reopened (with much less sway)

and I enthusiastically restored the element which had been preserved in the backend of the ARIS platform.³²

Through my experiences with Squibb Bridge, it became clear that despite the best laid plans and efforts to remain flexible to change, there was much which remained outside of my control as creator of an LBME, especially in the unpredictable kinetic chaos of the urban landscape. Even with built-in contingency plans, research into future development projects in an area, and periodic location visits, LBMEs run the risk of becoming obsolete and unusable without constant attention and upkeep. As we look for new opportunities to utilize emerging technologies, we must recognize the incredible amount of work and time required to build and maintain these projects.

Creating the Narrative

Once the locations were selected and their order set, I began constructing a narrative that could tie these sites together and accomplish three major project goals. First, I wanted to infuse Whitman's spirit into the project in a way that gave users the sense that they had somehow "walked" and interacted with the poet during their travels in Brooklyn Heights. I hoped that devising a more intimate and personal approach could bring Walt to life and create connections that extended beyond traditional scholarly methods. Second, the narrative also needed to supply users with a mechanism to contemplate their own relationship to place and its influence on their composing practices. This component would serve as a critical driver for user interaction and as a way to integrate active composing exercises throughout the experience. Finally, it needed to act as a delivery vehicle for the historical information related to each of the locations. In an effort to move away from the straightforward informational walking tour model I had already explored in the *Walking with Whitman* project, I instead looked to implement creative methods to convey this content. Ultimately, I wanted to develop a creative solution that engaged users through a balance of learning moments, creative composing exercises, and entertaining gameplay.

The first options I explored centered around transporting the user into the past to interact with Whitman in his historic context. Several ideas, such as working as a printing apprentice on the first edition

³² For more on the Squibb Bridge project, see Foderaro's article, "The Bridge Bounced Too Much. Now, After 2 Years, a Fix Is in Store." <https://www.nytimes.com/2016/07/14/nyregion/squibb-park-bridge-brooklyn-bridge-park-repairs.html>.

of *Leaves of Grass* or interviewing Whitman for a newspaper article held promise; however, bridging the user's experiences in present day Brooklyn Heights with a narrative grounded in the mid-nineteenth century presented complications. Even though incorporating and leveraging this discord might prove fruitful, I was concerned that these approaches lacked dramatic heft and would rely too much on the user's imagination, distracting them from being present during their experience. I then turned to my own experiences in Brooklyn Heights for inspiration. The one striking observation which I repeatedly returned to was how much the neighborhood had changed and how little remained from Whitman's era. I imagined a future where all links to the poet had been eradicated and contemplated what it meant to lose these connections in the never-ending push of urban modernization and redevelopment. In tandem with this line of inquiry, on a recent trip to Turkey, I had searched for a Turkish translation of *Leaves of Grass*. After scouring the many independent bookstores tucked into the side streets of Istanbul and the larger commercial book sellers with no luck, I went online to discover that there were no Turkish translations of the book available in any format. It was as if Whitman and his work didn't exist.

Although there were many possible reasons for this absence, it provoked me to consider if the same was possible on a larger scale. What would it take to completely remove the memory and legacy of Whitman in the United States, especially with the ubiquity of his work and the plethora of information pertaining to him in print and online? The loss of physical connections which had already occurred in the neighborhood had happened organically over time and with no intentional malice toward Whitman, but what if someone actively pursued this end and on a larger scale? I considered the many factions throughout history that had attempted to destroy the memory of individuals or groups and their creative works. I also began thinking through how the same modern technologies we rely on to preserve memory and information could be employed to achieve the opposite result. Through these thought exercises, I began fleshing out a script that focused on a fictional organization that intended to undertake the removal of Whitman from our collective human memory. Tasked with thwarting this outcome through the recovery of a long-lost manuscript of *Leaves of Grass*, the user would be immersed in a dramatic fantasy scenario that would be engaging and also illuminate the actual disappearance of connections to Whitman in Brooklyn. Participation in this experience would also act to preserve his legacy in real life through the user's exposure to the history and poetry embedded throughout the project. In the end, opting to take this

narrative direction gave me the freedom to begin realizing many of the desired outcomes of the project through creative methods that evolved from this scenario.

Final Game Narrative Synopsis

An unknown organization is attempting to systematically eliminate poet Walt Whitman's masterwork *Leaves of Grass* from humankind's collective memory. Playing the role of Agent Singer, users join the Great Companions, an underground network of concerned citizens, hackers, and educators dedicated to protecting great works of art and literature from forces determined to destroy them. With the help of a specialized team of secret agents and a Walt Whitman artificial intelligence (Walt 2.0), users must travel to locations throughout Brooklyn Heights connected to Whitman in hopes of discovering the location of a long-lost manuscript copy of *Leaves of Grass* before the villain finds it.

Whitman AI and Spontaneous Poetry

In further fleshing out the narrative for *Vanishing Leaves*, I wanted to focus on integrating Whitman into the storyline while also developing a relationship between him and the user. At the end of their experience with the game, I wanted players not only to have learned about the Poet, but to feel as if they had spent time with him walking through the streets of Brooklyn Heights. As opposed to scenarios set in the past, however, bringing Walt into the present meant contending with his inevitable reaction to the dramatic landscape changes and curiosity regarding all things modern. The idea to create Walt 2.0, an imaginary artificial intelligence (AI) built from Walt Whitman's digitized memories and a complete catalogue of his written work, eventually surfaced as I imagined unconventional technological solutions to the problem. Loaded onto their mobile devices, Whitman could be a constant presence in intimate proximity to the user, yet not have to be physically present, alleviating the need to reconcile his 19th-century world view with the user's surroundings in the present.

Through this character, Whitman's voice and work were brought into the narrative in multiple ways. First, all of the AI's dialogue is composed of text taken from *Leaves of Grass*. Using digitized versions of each edition of the book made available online by *The Walt Whitman Archive*,³³ I conducted searches for words and phrases that fit specific narrative moments. Thanks to Whitman's informal,

³³ To see the list of editions, see whitmanarchive.org/published/LG/index.html.

conversational tone, his unrhymed verse, and his penchant for speaking directly to his audience, I was able to build an authentic dialogue that preserved both his dialect and spirit in the game. At the same time, cobbling these fragments of poetry together brought a disjointed, awkward quality to the character's speech which worked well for the imperfect nature of the corrupted Whitman simulation. Taking this concept a step further, I decided to restrict the AI's vocabulary at the beginning of the game, limiting my phrase searches to the 1855 edition. Every time Walt 2.0 is upgraded in the script, I would expand those searches to include new material from the subsequent edition. By the conclusion, the AI has access to text from all editions of the book, including the final and voluminous 1881-82 edition, which dramatically improves its vocabulary range and fluency. This progression helped bring a certain growth to the character, and also introduced a wide swath of Whitman's poetry into the game, work that stretched across his life and that embodied his accrued wisdom and experiences.

Whitman AI: Upgrade List

Upgrade 1: Walt AI is upgraded to version 2.1 and uses text from the 1856 edition of *Leaves of Grass*.

Upgrade 2: Walt AI is upgraded to version 2.2 and uses text from the 1860 edition of *Leaves of Grass*.

Upgrade 3: Walt AI is upgraded to version 2.3 and uses text from the 1867 edition of *Leaves of Grass*.

Upgrade 4: Walt AI is upgraded to version 2.4 and uses text from the 1871-72 edition of *Leaves of Grass*.

Upgrade 5: Walt AI is upgraded to version 2.5 and uses text from 1881-82 edition of *Leaves of Grass*.

Second, throughout the game, whenever Walt 2.0 becomes inspired, he launches into a "spontaneous poetry" recitation. These geolocated audio recordings, each selected for a specific connection to the location to which they are linked, reinsert Whitman's poetry back into the landscape, grounding his work and voice in the environment from which it emerged. Hearing Whitman's poetry in this way changes our level of attention to it, and works towards humanizing the poet while at the same time highlighting his style and techniques. As Gardner Campbell eloquently stated, "there is magic in the human voice, the magic of shared awareness. Consciousness is most persuasively and intimately communicated via voice. The voice is literally inspired language, language full of breath, breath as language" (40). As we listen to Whitman's words, the world he experienced is brought to life in our

present moment. We can imagine him standing beside us, looking out and observing on a Brooklyn Heights far different from ours, yet still kept alive and vibrant through his poetry.

List of Audio Recordings and Locations

Rome Print Shop: "Leaves of Grass," later known as "Song of Myself"

Plymouth Church: Runaway Slave from "Leaves of Grass"

Brooklyn Promenade: "Manahatta"

Granite Prospect: "Poets to Come"

Eagle Warehouse: "Starting From Paumanok"

Fulton Ferry Landing: "Crossing Brooklyn Ferry"

GeoUploads

In creating *Vanishing Leaves*, it was extremely important to facilitate meaningful personal involvement in the project so as to avoid it serving solely as a vehicle for information delivery. To accomplish this goal, throughout the narrative at the game locations in Brooklyn Heights, users are required to create GeoUploads to repair the fragmented memories of the Whitman AI in order to advance their search for the location of the lost *Leaves of Grass* manuscript. These place-based compositions are designed not only to illuminate different aspects of Whitman's life and writing related to each location, but also to encourage users to consider the ways in which place inspired and informed his creative process and product. For instance, at the Brooklyn Promenade players listen to Whitman's poem "Manahatta" as they look out across the East River. Seeing Manhattan's 19th-century skyline through Whitman's panoramic gaze helps establish a link between his writing and the location while simultaneously providing historical context. Users are then asked to compose their own poem from the vista, documenting the sights and sounds of the modern cityscape. Through this shared act of creation on this literal common ground, a tangible connection is formed between the learner and Whitman that helps to draw their environments and compositions into conversation with one another. This bond is further reinforced through the gameplay and narrative as players upload their compositions into the Whitman AI program, creating a direct link between their present experiences and those of Whitman stored in Walt 2.0's memory bank. Furthermore, through the geolocation properties of the user's mobile devices, once a

GeoUpload is complete, it is automatically added as an icon to the game map at the location where it was composed, leaving a visible mark of the user's experience at the place. Positioned among the GeoUploads left by previous players, this visible marker not only connects the user's experience to Whitman's, but also places it in the company of an ever-expanding network of Whitman scholars and enthusiasts who have traveled to Brooklyn Heights to explore his legacy.

Ultimately, the GeoUploads serve as the perfect vehicle to implement the ecocomposition theory which inspired *Vanishing Leaves*. Through these exercises, users are able to contemplate the complexity of the discursive act, meditating on the dynamic and ongoing relationship between place, writing, and identity through their active composing practice. As this practice extends across locations and into the digital space through the use of mobile technologies, that matrix of intersecting elements is further expanded, offering an increasingly complex ecological representation of the discursive process.

GeoUpload Learning Goals

Following is a list of each GeoUpload and the text accompanying it.

GeoUpload 1: Rome Print Shop

One of the guiding conceits of *Leaves of Grass* is, perhaps unsurprisingly, the humble blade of grass! In the first edition, Whitman used it not only as the book's title, but also as the title of the first six poems of the volume. This democratic symbol connected the singular to the masses and focused the reader's attention on the natural beauty inherent in even the most simple and mundane of objects.

Instructions:

Use the camera tool to take a picture of a blade of grass from this location!

GeoUpload 2: Plymouth Church

One attribute of Whitman's poetry that was often linked to preachers such as Henry Ward Beecher was the way in which he spoke plainly and directly to his audience. Whitman sought to harness that conversational language in his "free verse" poetry, largely doing away with traditional form, rhyme scheme, and meter, opting instead for emotion, passion, and intimacy.

Instructions: Let's channel the power of Whitman's free verse with your own spontaneous poetry! Use the text tool to channel inspiration you have at the moment. Pause, look within, and don't be afraid to speak from your heart!

GeoUpload 3: Brooklyn Promenade

Whitman would often meditate on the skyline of Manhattan, or as he liked to call it, Mannahatta. From his vantage point in Brooklyn Heights, the spires and tall masts of the city were a dazzling representation of the flourishing American promise as well as a beacon calling him across the river to embark on a new adventure.

Instructions: Use the text note tool to meditate on the Manhattan skyline from your perspective. What do you see when you look out from the Promenade?

GeoUpload 4: Granite Prospect

Whitman often spoke directly to his future readers in his poetry, reaching out to inspire an audience he would never meet, but still hoped would continue his legacy. This is your chance to share insights from our moment in this place with "those to come." What wisdom will you share to carry on Walt's legacy?

Instructions: Use the text or audio note tool to leave a message for an unknown future reader or listener!

GeoUpload 5: Brooklyn Daily Eagle

Whitman often used anaphora, the repetitive phrasing at the beginning of each line of a poem, to create extensive catalogues of sensory input. At times, the technique creates the sensation of looking out through the gaze of a reporter in the field who takes in every detail in order to create a complete and vivid picture. Certainly, from his office at the *Brooklyn Daily Eagle* and on the surrounding streets, there would have been no shortage of inspiration for Walt's reporting or poetry.

Instructions: Use the text tool to catalogue the sights and sounds of Fulton Street around you. Try to use the anaphora technique as you document the modern streets of Brooklyn Heights!

GeoUpload 6: Fulton Landing

Take a moment to view Whitman's words on the Fulton Landing railing. Choose one word that you connect with and use the camera tool to document yourself with it. Then, using the description field of the note, compose a poem based on that word. This is your chance to create a unique poetic expression that will honor Whitman and his work!

GeoUpload 6: Yawp

Record a voice note and tag it "YAWP" to complete the game!

Mission Files

Finally, despite the playful narrative, it was essential to maintain the game's primary function as a learning tool and assure that ample historical information was offered to users throughout their experience. Employing the GPS features of the user's mobile device and the ARIS application, I sought to deliver this content at relevant locations in a manner that made it feel as if the landscape was responsive, revealing its history to the learner through their movements and contact with it. This was ultimately accomplished through the use of Mission files, documents geolocated and delivered at designated sites throughout Brooklyn Heights that contained in-depth historical information related to Walt Whitman and the neighborhood. For example, standing in a courtyard beneath two residential towers near Cadman Plaza, users learn that the Rome print shop, the site where Whitman published the first edition of *Leaves of Grass*, once stood upon the now-unremarkable lot. Through the mission file, detailed information is provided regarding the book's publication, Whitman's involvement in the printing process, and the Rome building's history and fate. In addition to gaining a deeper comprehension of the location's history, understanding Whitman's link to this site also helps to establish a common ground between the user and the Poet, which draws their experiences into conversation. It is a connection that helps to reveal commonalities and intersections, but one that also exposes the radical changes which have occurred to the area, including the loss of important landmarks from Whitman's Brooklyn.

Once a mission file is received it can be accessed through the ARIS application at any point during the game or on the *Vanishing Leaves* companion website³⁴ at any point after. Due to the significant time and energy required by the user to complete the experience, making this information readily available outside of the game platform allows the user to focus on the content most important to them and decide how much reading they wish to undertake while navigating the streets of Brooklyn Heights. In addition, providing a method for users to access and revisit these resources in the future extends the learning experience and offers a starting point for further research.

Although the Mission Files were the predominant delivery mechanism for educational information, I was concerned that the time and effort required to read long passages of text on a mobile device might impact the user's overall desire and ability to complete the game. As a self-guided undertaking, I also wanted to leave it to the user to decide how much they read and the subjects they explored. With that in mind, alternate and condensed historical information was presented in two ways to supplement the mission files. First, through the dialogue of the character Backstory, the Whitman and Brooklyn specialist assisting the user during their mission, I was able to consistently inject digestible factoids into conversations. Second, through game plaques, the location markers on the ARIS map interface which indicate player's destinations, the user was presented with concise bullet points about the significance of the location. Taken together, I hoped that even if the user did not read the Mission Files, these methods would still provide enough background information on the locations to illustrate their history and importance.

Sample Plaque Text

Mission Plaque: Brooklyn Eagle Warehouse

- Site of the *Brooklyn Daily Eagle* from 1841-1890.
- Walt Whitman worked as the paper's editor here from 1846-1848. A plaque near the entrance of the building pays tribute to Whitman's time at the *Eagle* and his contributions to poetry.

³⁴ Companion Website: <http://gc.vanishingleaves.com/mission-files>.

- In 1882, the original building and additions were completely razed and replaced with a three story, fireproof, brick building designed by G.S. Morse.
- In 1894, Brooklyn Eagle Warehouse Co. purchases the property and rebuilds, leaving only the press and composing rooms on the corner of Elizabeth and Doughty standing.
- Designated a landmark structure in 1977 by the New York's Landmarks Preservation.

Future Improvements and Next Steps

With Digital Humanities projects it often seems as if the work is never truly complete. Even as I reached a stable version of *Vanishing Leaves* that I was content with, several minor issues and potential improvements to project's usability and user experience remained which would benefit from continued development in the future.

First, one issue that arose during testing was the inability for users to easily export the content they created within the game off of the ARIS application. Although each GeoUpload is preserved as a geolocated item on the gaming map, once a player completes the experience they can no longer access the notebook which stores their compositions. Unfortunately, the only solution currently available is to copy the writings into another note taking application during gameplay, which breaks up the experience and presents a potential obstacle for the further development of these compositions. Despite this issue, the ARIS notebook feature is central to the *Vanishing Leaves* gameplay as currently constructed, making a proper resolution in the short term unfeasible. In the future, adding a feature to ARIS that prompted users to export their content at the end of the experience could resolve this issue, however the solution would require altering the platform and likely the procurement of funding for development costs.

Second, although my intention was to create a place-based learning experience with mobile devices, I would like to develop an alternate version of the project which allowed those unable to travel to Brooklyn Heights or undertake the physical experience an opportunity to benefit from the project's content. Through the ARIS application's game cloning feature, it would be possible to start from the current version of the project and rework specific elements, such as the composing exercises, so that they were not place-specific. In addition, more multimedia content could be added to give users a sense of the present day neighborhood without being at the location.

Another way that *Vanishing Leaves* could be improved is with the integration of additional interactive gameplay features. Although efforts were made to generate user involvement through GeoUploads, multiple, diverse interactive encounters could be deployed to convey content in variety of ways which could help to maintain user investment and interest. For instance, one of the features added to the latest iteration of the ARIS platform was augmented reality (AR) functionality. Using this feature to overlay archival images over actual locations could bring a more direct sense of the changes that have occurred in the neighborhood. Superimposing video of characters over the environment could help bring Whitman to life and further humanize him, and move away from the text-heavy structure of the current project towards a more rich and engaging multimedia experience. With 5G speeds on the horizon, integration of this content in the near future is becoming more feasible and could be possibly be implemented within the existing structure of the project.

Increased user involvement could also be realized by incorporating ARIS's multiplayer gaming functionality which makes possible group experiences such as scavenger hunts and data collection exercises. *Vanishing Leaves* was intentionally developed as a single player experience that encouraged contemplation and reflection. It attempted to use mobile devices in a manner that went against our tendency to be in constant contact with others and incessantly inform and filter our actions and decisions through our social networks. However, for many LBMEs, social interaction is an essential feature of their project design and gameplay (e.g. *Frequency 1550*³⁵, *Pokémon GO*, and *Mogi*). In addition, incredible work has been done contemplating the emergence and use of mobile social networks and location-based social networking applications, which could be of great use harnessed for learning goals.³⁶ Applied to the study of Whitman, whose social connections were as important to his life and writing as his physical contexts were, a project which focused on collaboration and interpersonal communication could bring this vital part of his identity to life while encouraging users to interact with one another through shared experiences.

Finally, I would like to expand the *Vanishing Leaves* project to include modules which explore additional locations with connections to Whitman. A primary inspiration for this development comes from

³⁵ For more on *Frequency 1550*, see de Souza e Silva and Gordon 2011, p. 75.

³⁶ See de Souza e Silva and Firth 2010, Chayko, Gergen, Turkle, Jenkins, and Baym.

the 2009–2010 project “Looking for Whitman: The Poetry of Place in the Life and Work of Walt Whitman,” which brought together classes from four academic institutions to “help students and faculty members trace the lingering imprints of Whitman’s footsteps in the local soil” (Gold). Taking place in New York City, Camden, Washington D.C. and Serbia (which Whitman did not visit), this project was able to bring these locations and the learner’s experiences at these sites into conversation with one another using open-source digital tools that fostered collaborative learning and dialogue.³⁷ It would be interesting to incorporate ARIS into this model, building out these alternate modules over the course of a semester so that learners in remote locations could “visit” sites connected to Whitman. Educators could eventually build out these modules from any location, creating an organic network of Whitman-based experiences to choose from.

With this in mind, *Vanishing Leaves* could also be expanded to include narratives dealing with writers that explore other New York City neighborhoods, bringing different historical times and locations into conversation. A game in the lower east side of Manhattan, for instance, could focus on Beat Poets in the 1950s such as Allen Ginsberg, Jack Kerouac, Diane di Prima, Neal Cassady, and Anne Waldman. In Harlem, the work and life of Harlem Renaissance poets Langston Hughes, Claude McKay, and Zora Neale Hurston could be explored. These additional nodes would allow users to choose particular topics of interest which covered a diverse set of writers and moments from New York City’s history.

As a prototype, it still remains to be seen whether or not *Vanishing Leaves* achieves the objectives it set out to accomplish. It is clear, however, from my experience building the project that the design and development of LBMEs hold tremendous potential as an academic learning exercise that encourages exploration and creativity as well as scholarly research and writing.

Through the iterative design process, the project forged a tangible and dynamic relationship between place, research, and technology, each element continually informing and impacting the others.³⁸

Research into Whitman’s connection to Brooklyn Heights, for example, inevitably exposed new locations of interest, which necessitated further exploration in the neighborhood. These subsequent visits would in

³⁷ For more on the “Looking for Whitman” project, see Matthew K. Gold, “Looking for Whitman”: A Multi-Campus Experiment in Digital Pedagogy,”

<https://www.openbookpublishers.com/htmlreader/DHP/chap06.html - ch06>.

³⁸ For more on design-based research, see Holden and Sykes 33-34.

turn reveal new insights and threads of inquiry requiring additional investigation. Simultaneously, this work was constantly filtered through the affordances and limitations of the mobile technologies being used, further shaping the project's direction and final outcome. Much like Katherine Hayle's feedback loops (135), the conversation between these intersecting components often led to surprising new directions, previously unseen possibilities and problems, and a more complex and holistic approach to scholarly knowledge production.

Finally, through the development of the project, not only did my own understanding of Whitman's historical context and work grow exponentially, but I was also able to nurture my personal connection to the Poet. Each moment spent walking and exploring Brooklyn Heights searching for links to Whitman; the countless hours spent reading his poetry, correspondences, and journalism; and the ongoing attempts to see the world through his eyes and bring that vision to life for others; all of these experiences built my admiration for this man whose voice and spirit called out to me across space and time to contemplate our essential human connection to one another: "What is it, then, between us?/ What is the count of the scores or hundreds of years between us?/ Whatever it is, it avails not—distance avails not, and place avails not" (LOG 1860 383). I can only hope that in generations hence someone finds this project inspiring and creates something of their own, continuing Whitman's legacy in new and unexpected ways.

Epilogue: Dissertation Catalogue

There was a scholar went forth every day, and everything he read, researched, and wrote, became part of his dissertation.

All of his education and teachers through the years, his fine arts training, his graphic and website design experience, they became part,

And his hardware became part, his iPhone, iPad, Macbook Pro, and iMac,

And software became part, Wordpress, PhP, SQL, ARIS, Photoshop, Google Docs, Scrivner, Word, Reclaim Hosting,

And satellites, web browsers, and cellular towers,

And countless hours of video games, Pong and Donkey Kong, Nintendo blisters, Skyrim, and Red Dead Redemption, these too became part of his dissertation.

And each location he lived, the places where he learned and researched, and all of the people he met, interacted with, and loved became part,

Cold Spring and the Hudson, his Mom and Dad, Avril, Kyle, Kate, and Garth, his extended family, his ancestors, Jean Marzollo, the Throwbacks, and the Breakneck Boys,

Camden and Whitman's Mickle street house, his galoshes and bed, the empty lots surrounding, Rutgers-Camden, Tyler Hoffman, Leo Blake, Christine Fitzsimmons, and the *Mickle Street Review*,

Paumanok, West Hills and Whitman's Birthplace, Cynthia Shor, and Jayne's Hill,

Brooklyn Heights, Whitman Park, Fulton Street and the Ferry landing, The East River, the Eagle Warehouse, Brooklyn Bridge park, Squibb Bridge, and the Granite Prospect,

And Mannahatta became part, the Graduate Center and the English Department, ITP, Nancy Silverman, Stephen Klein and Roxanne Shirazi, the Bard Graduate Center, Peter,

Elena, Emma, and David, all of these became part of his dissertation.

And the mobile and scholars of the digital, David Gagnon, Chris Holden, Jason Farman, Amanda Visconti

And his great companion Kimon Keramidas became part,

And his dissertation committee, Matt Gold, Sondra Perl, and Steve Brier, each became part.

The Whitmaniacs across the globe became part, Ed Folsom, Ken Price, and *The Walt Whitman Archive*, *The Walt Whitman Initiative*, *The Whitman Consortium*, the Whitman scholars of past and present, David Reynolds, and Karen Karbiener.

And his patient and endlessly caring and supportive wife Olgu (who deserves her own catalogue) became part of his dissertation.

And Whitman became part of the dissertation, his poetry, letters, journalism, spirit, his free verse, his love of the body and mind, of Brooklyn and Broadway, the roughs, the open road, these all became part of his dissertation.

These, and many more that I am forgetting, became part of his dissertation and will always be a part of his dissertation. YAWP!

Appendix A: Game Script

Game Script is available at: <http://vanishingleaves.com/>

Appendix B: Audio Files

Audio files available at: <http://gc.vanishingleaves.com/mission-files>

Appendix C: Screenshots

Following is a collection of images take from the ARIS editor (Fig. A1 - Fig. A3), the ARIS client (Fig. A4 - Fig. A15), the *Vanishing Leaves* companion website (Fig. A16 - Fig. A21), and the white paper website (Fig. A22).

ARIS Editor Screenshots

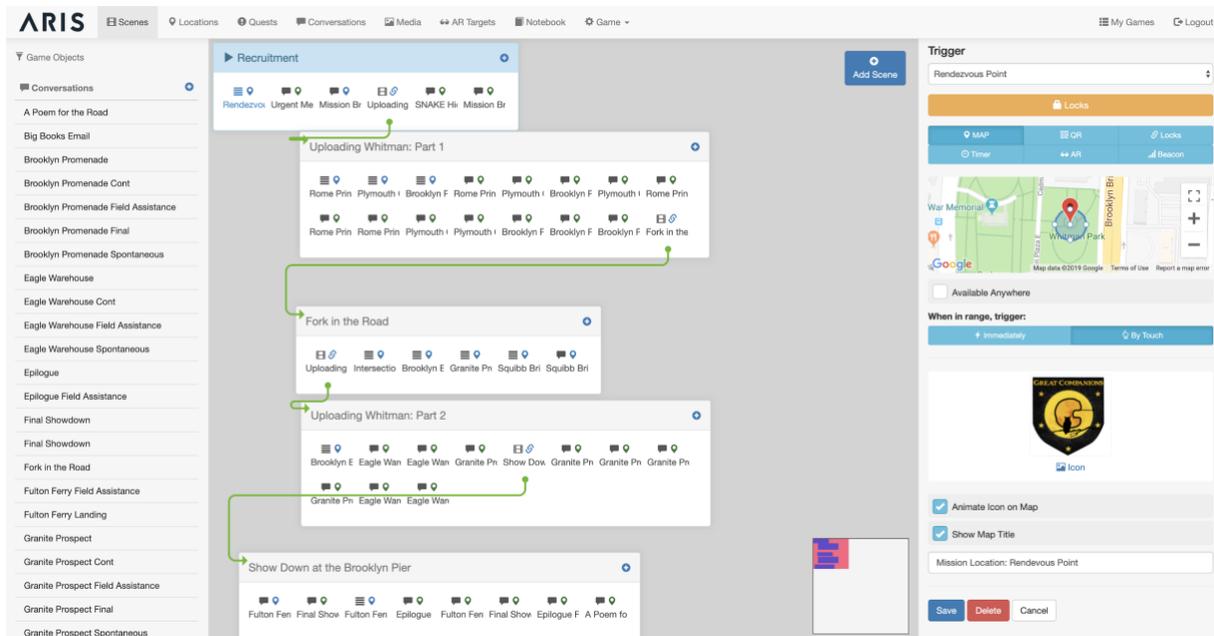


Fig. A1. ARIS Scene Creator

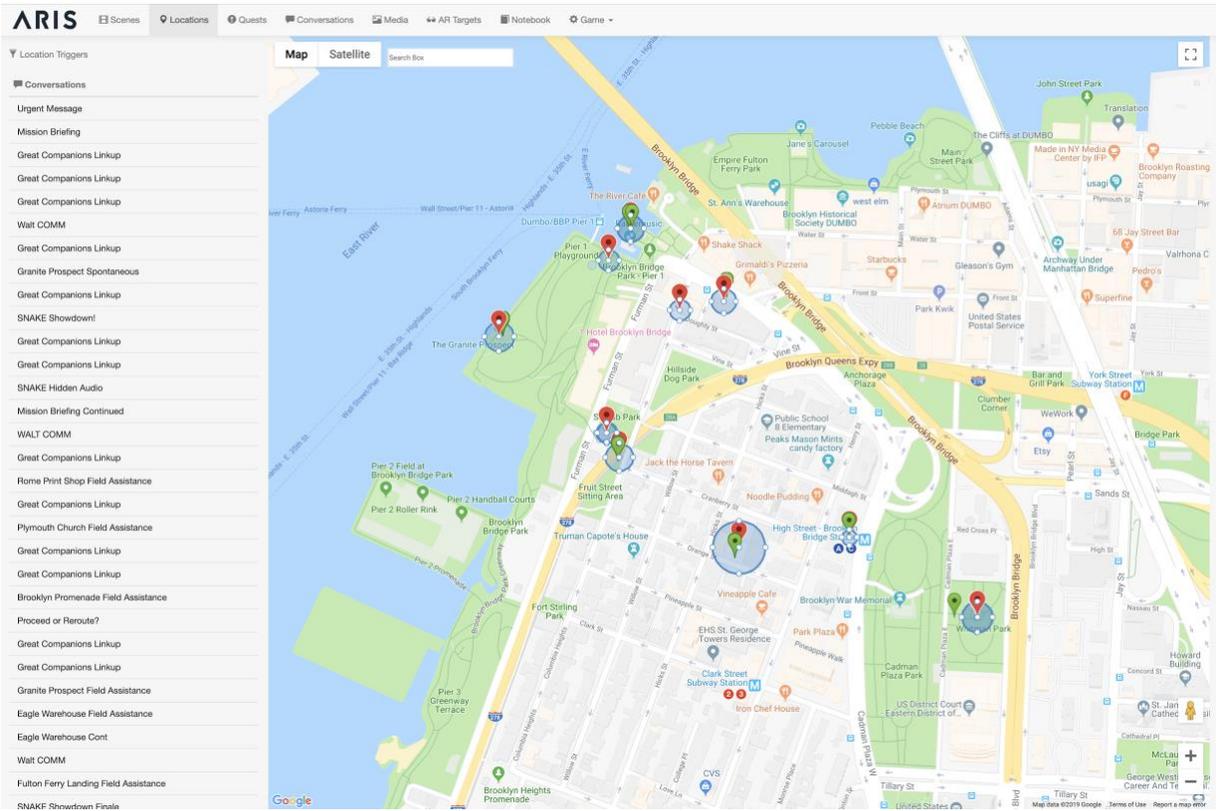


Fig. A2. ARIS Location Screen

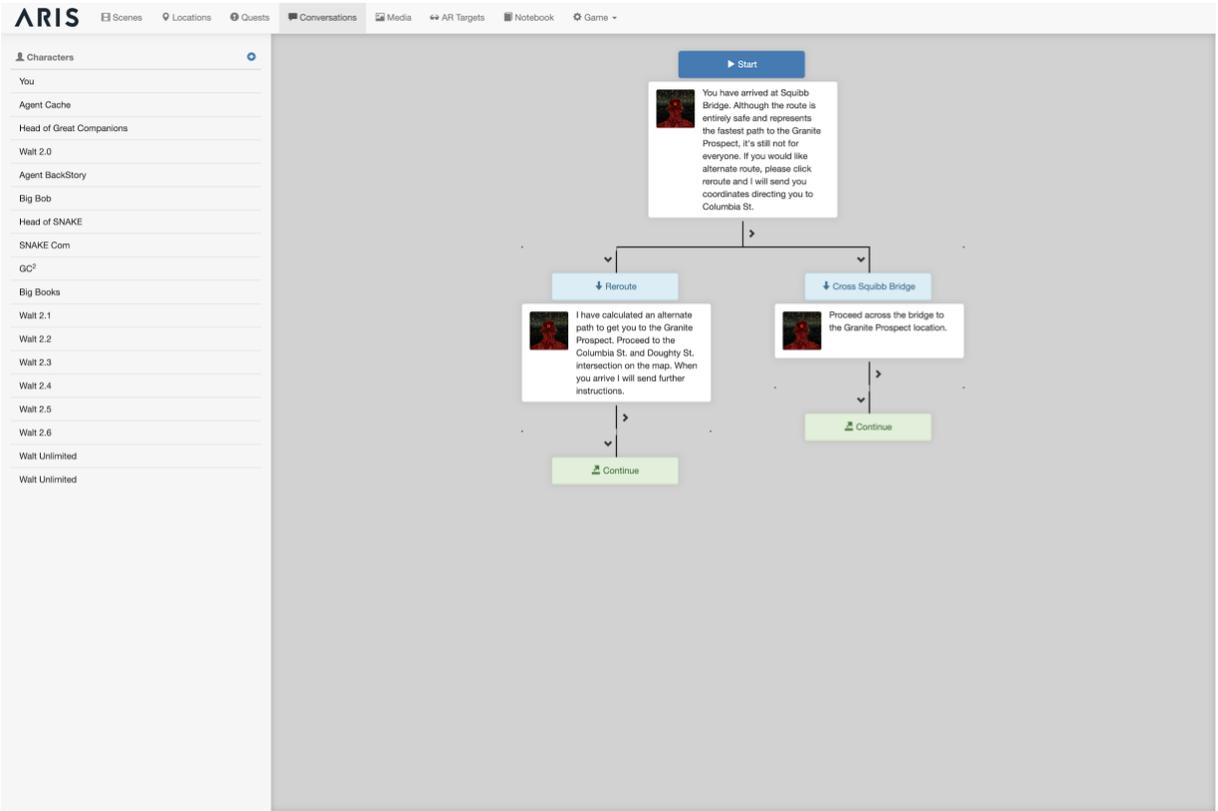


Fig. A3. ARIS Conversation Creator

ARIS Client App Screenshots

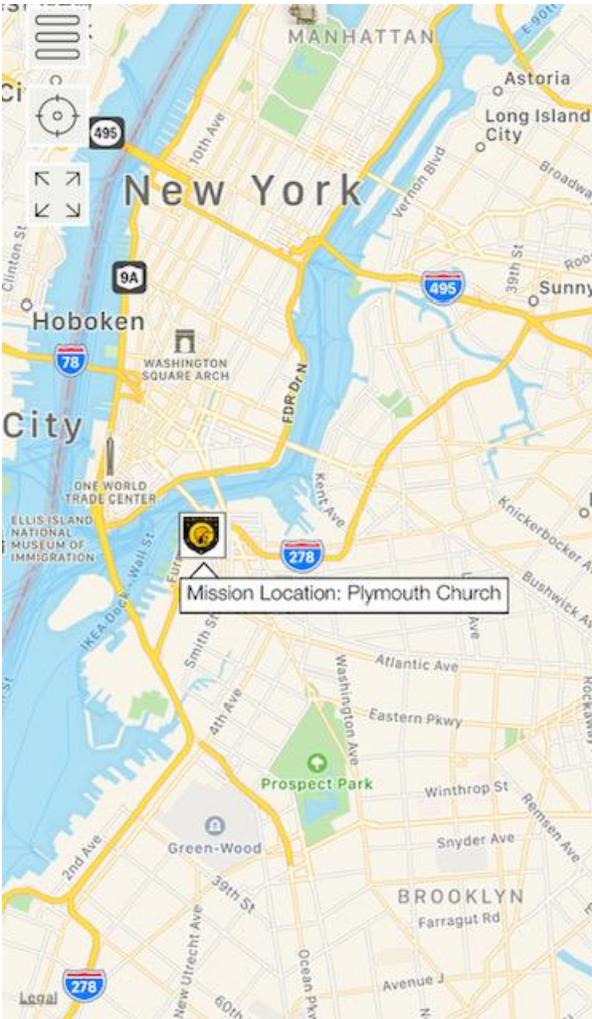


Fig. A4. ARIS App: Gameplay Screen

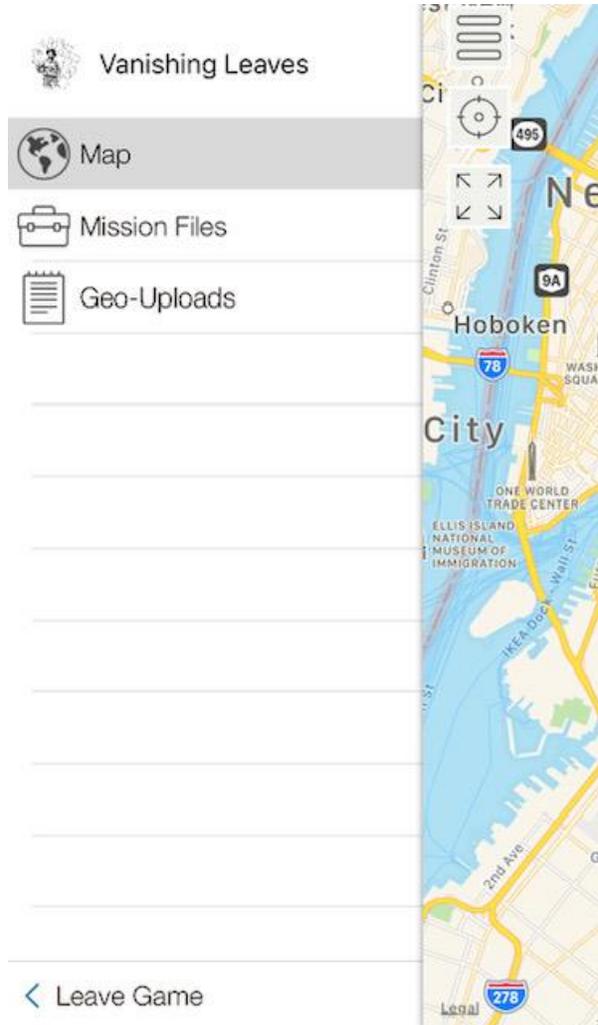


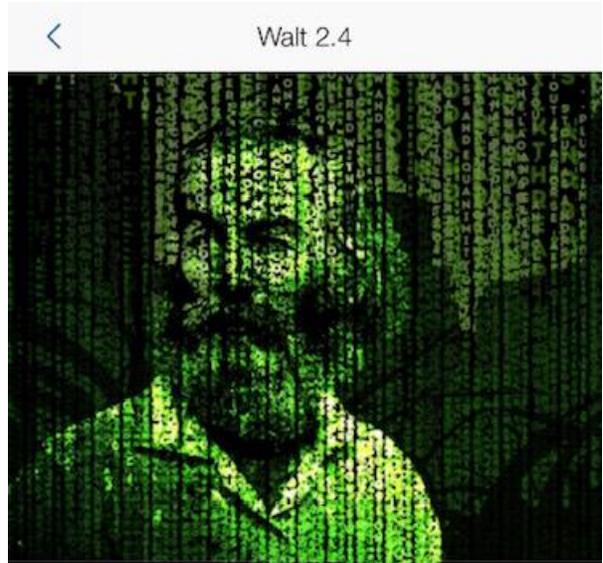
Fig. A5. ARIS App: Main Menu



Agent Singer, I greet you at the beginning of a great career! It is I, your mission companion and resident Whitmaniac Jeff! Sorry, I mean Agent BackStory! Still getting used to this secret agent thing! I'm here to assist you in your quest to defend the Good Grey Poet aka Walt Whitman!

I have uploaded a file into the GC² main frame to start you off with some information about Walt and his connections to Brooklyn Heights.

Fig. A6. ARIS App: NP Character



What do you see, Walt Whitman? I watch'd with joy all beings, even the tiniest insect. I watch'd all the things of the universe. I see my own days in Brooklyn and Manhattan. In all people there I see myself—none more, and not one a barley-corn less. I see through a mist, and am one with them, one with all.

Listen to Walt's Vision!



Fig. A7. ARIS App: Whitman AI Character



Brooklyn Eagle Warehouse

Brooklyn Eagle Warehouse

- Site of the *Brooklyn Daily Eagle* from 1841-1890.
- Walt Whitman worked as the paper's editor here from 1846-1848. A plaque near the entrance of the building pays tribute to Whitman's time at the *Eagle* and his contributions to poetry.
- In 1882, the original building and additions were completely razed and replaced with a three story, fireproof, brick building designed by G.S. Morse.
- In 1894, Brooklyn Eagle Warehouse Co. purchases the property and rebuilds, leaving only the press and composing rooms on the corner of Elizabeth and Doughty standing.
- Designated a landmark structure in 1977 by the New York's Landmarks Preservation

Continue >

Fig. A8. ARIS App: Brooklyn Eagle Location Plaque

<

LEAVES OF GRASS.

Excerpt from "Leaves of Grass." (1855)

▶ 00:00 00:00

I CELEBRATE myself,
And what I assume you shall assume,
For every atom belonging to me as good
belongs to you.

I loafe and invite my soul,
I lean and loafe at my ease . . . observing a
spear of summer grass.

Houses and rooms are full of perfumes . . .
the shelves are crowded with perfumes,
I breathe the fragrance myself, and know it
and like it,
The distillation would intoxicate me also, but
I shall not let it.

Fig. A9. ARIS App: Poetry Audio Screen



Fig. A10. ARIS App: Brooklyn Eagle Mission File

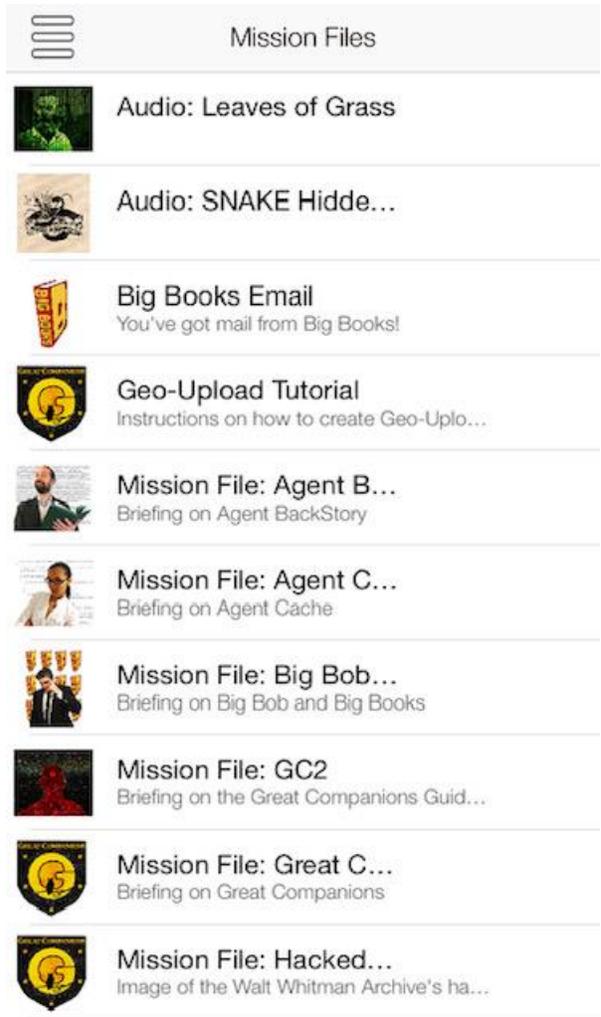


Fig. A11. ARIS App: Mission File Menu Screen

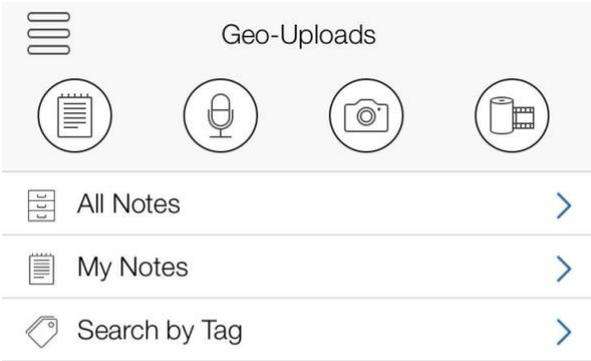


Fig. A12. ARIS App: GeoUpload Main Menu Screen

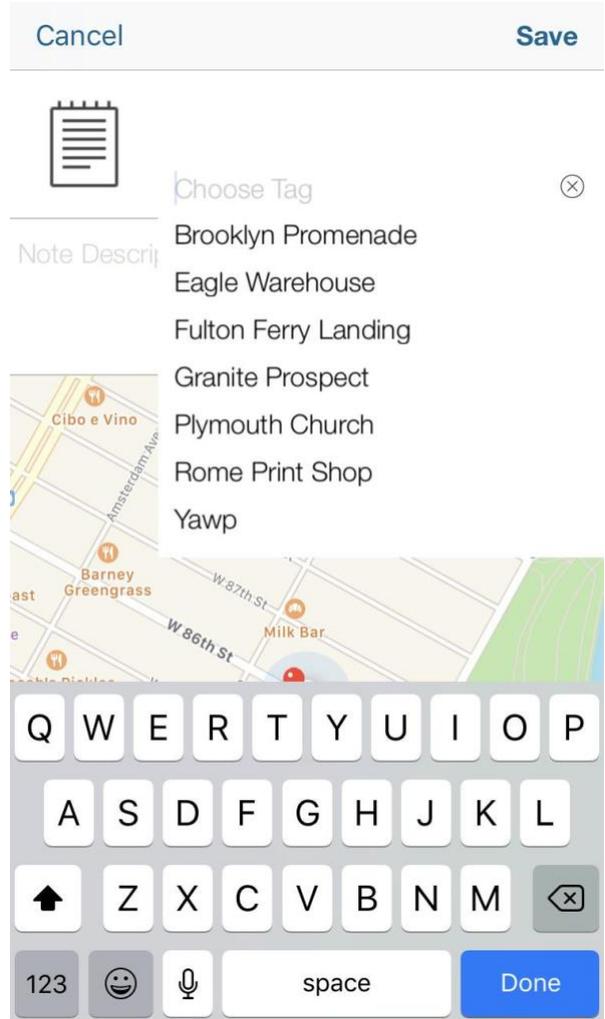


Fig. A13. ARIS App: GeoUpload Composing Screen

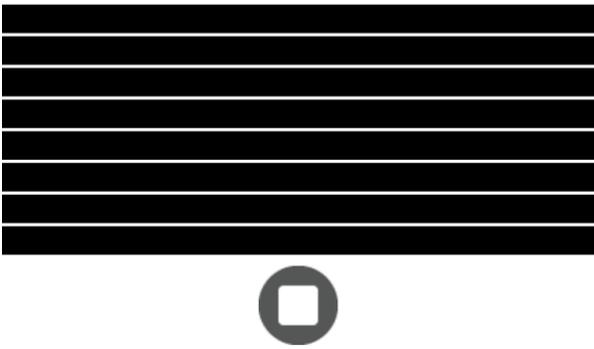
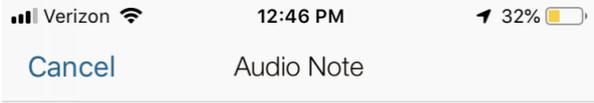


Fig. A14. ARIS App: GeoUpload Audio Note

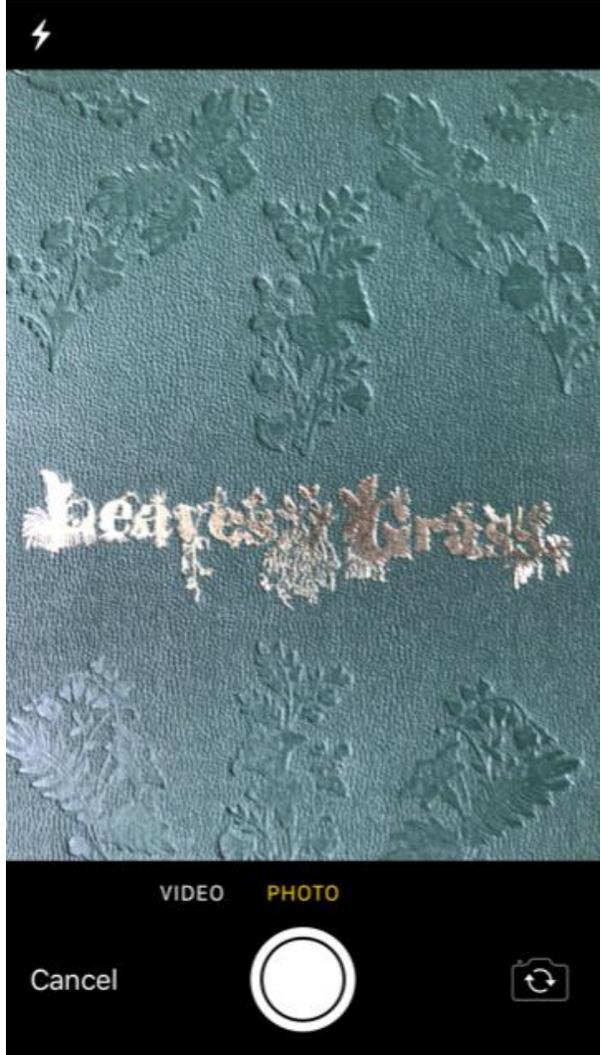


Fig. A15. ARIS App: GeoUpload Video Note

Vanishing Leaves Companion Website



OPERATION VANISHING LEAVES

MISSION FILES

MISSION HOME

GC² MISSION NETWORK

Vanishing Leaves is a location-based mobile experience which takes players to Brooklyn Heights to learn about Walt Whitman in the neighborhood where he wrote and published the first edition of *Leaves of Grass*.

In this game you play Agent Singer, an undercover operative working for the Great Companions. This underground network of citizens, hackers, and educators works behind the scenes to protect writers and works of literature from forces determined to censor and suppress them. Recently, an unknown enemy emerged that has been threatening to wipe Walt Whitman and *Leaves of Grass* from human memory. You must stop them and uncover the perpetrator's identity before it is too late.

This page provides detailed information regarding your mission and instructions for playing the game.

GAME TIME: APPROXIMATELY 2 1/2 HOURS.

Can't get to Brooklyn Heights? Go to the "Getting Started" page, follow the instructions, and play the "Vanishing Leaves: Play at Home" version.



This video details how to download and play Vanishing Leaves, a location-based mobile experience that takes you to Brooklyn Heights to learn about Walt Whitman's life and work. 1.Downloading ARIS-00:18; 2.Getting the Game-1:16; 3.The Main Menu-1:53; 4.The Map Interface-2:22; 5.Moving Between Locations-3:00; 6.Conversations-5:50; 7.Mission Files-6:19; 8.Audio Files-7:00 9.GeoUploads-7:20

GETTING STARTED

In order to play *Vanishing Leaves* you first need to download the ARIS (Augmented Reality Interactive Storytelling) application to your mobile device. This critical briefing walks you through getting set up and the technical specifications required to play the game.

[ACCESS FILE](#)

HOW TO PLAY VANISHING LEAVES

This file provides information on how to play the *Vanishing Leaves* game including how to navigate the main game interface.

[ACCESS FILE](#)

GEUPLOAD INSTRUCTIONS

This walk-through demonstrates how to successfully create GeoUpload files, place-based composing exercises which are required to complete the game.

[ACCESS FILE](#)

HOW TO GET TO BROOKLYN HEIGHTS

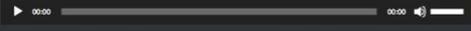
This location-based game is designed to be played in Brooklyn Heights. Find out how to get there!

[ACCESS FILE](#)

OPERATION VANISHING LEAVES

About a month ago, booksellers, private collectors, universities, and libraries started receiving substantial offers from an anonymous buyer for their first edition copies of Walt Whitman's *Leaves of Grass*. Those that refused had their copies stolen in a series of highly sophisticated thefts. In a matter of weeks, all existing first edition copies of the book had been acquired from both private and public collections. Then, this morning, an online virus called "Mower" was released that took down every webpage containing Whitman's poetry and prose, as well as all scholarship pertaining to him and his work. Online booksellers (even e-commerce giant Big Books) were forced to discontinue offering Whitman's works after their product pages were hacked. In each instance, the content on the webpage was replaced by a mysterious snake logo and the text, "ophidia in herba."

Several of our technical agents scoured the code of these hacked pages and discovered a secret audio link embedded in the snake image. Review the audio message below.



Agent Singer, if what this recording says is true, *Leaves of Grass* is in danger of becoming a lost work, forgotten forever by humankind. Your mission is to save it and Walt Whitman from obscurity and discover who is behind this plot.

MISSION TEAM

A team of specialized agents has been assembled to assist you with your mission and provide you with important information and objectives. Learn more about the Great Companions and your team!



GREAT COMPANIONS



AGENT BACKSTORY



AGENT CACHE



GC²

Fig. A16. Vanishing Leaves Companion Website Homepage



OPERATION VANISHING
LEAVES

MISSION FILES

MISSION HOME

GEOUPLOAD INSTRUCTIONS

WHAT IS A GEOUPLOAD?

GeoUploads are place-based compositions that players are required to create in order to advance the *Vanishing Leaves* narrative and complete the game. During gameplay, you will receive detailed instructions from your mission team to guide you through the specifics of each particular GeoUpload. There are three types of GeoUploads you will have to create during the game: text-based, audio, and photo/video.

TEXT UPLOAD:

Touch the paper icon in the GeoUploads section of your mission menu. Use the description box to enter your content.

AUDIO UPLOAD:

Touch the microphone icon in the GeoUploads section of your mission menu. Press the circle button at the bottom of the screen to begin recording. You will have the option to "use" or "retake" the audio. Once you have decided to use the audio, you will be taken to a screen where you must apply the appropriate tag to the GeoUpload.

PHOTO/VIDEO UPLOAD:

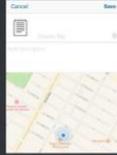
Touch the camera icon in the GeoUploads section of your mission menu. Select either Video or Photo. Press the circle icon to record. You will have the option to "use" or "retake" the photo/video. Once you have decided to use the photo/video, you will be taken to a screen where you must apply the appropriate tag to the Geo-Upload.



GEOUPLOAD MAIN SCREEN



TAGGING A GEOUPLOAD



TEXT NOTE



AUDIO NOTE



IMAGE/VIDEO NOTE

TAGGING

Tagging is a key part of each Geo-Upload. Each location in the game has a matching GeoUpload tag which you will need to apply before you are finished. In order to apply a tag, just tap the "Choose Tag" text or the small (+) symbol to select the appropriate tag from the dropdown menu.

Fig. A17. *Vanishing Leaves* GeoUpload Instructions



OPERATION VANISHING LEAVES

MISSION FILES

MISSION HOME

GETTING STARTED

DEVICE REQUIREMENTS:

To play *Vanishing Leaves* you must have an iOS device (iPod, iPad, iPhone) with GPS functionality and cellular service. If you manage cellular usage on an individual app basis, make certain ARIS is given permission to use cellular data.

Headphones: Headphones will help you enjoy the game's audio elements. You will not need to have your headphones on throughout the experience however, only when you see the audio player.

HOW TO GET THE GAME

- 1. DOWNLOAD THE ARIS APP**

Download the free ARIS (Augmented Reality Interactive Storytelling) mobile app from Apple's App Store onto your device. Use the search term "ARIS Mobile" and look for the back triangle logo. Requires iOS 8.0 or later. Compatible with iPhone, iPad and iPod touch.
[Link to App Store](#)

ARIS was developed at the University of Wisconsin-Madison. For more information on this project (or to build your own game!), visit <https://fielddaylab.org/make/aris/>
- 2. CREATE AN ARIS ACCOUNT**

Open the ARIS app and select "create an account." Choose an ARIS ID (username) and a password, and then enter the email address you wish to associate with your account. Once completed, the app will prompt you to take a user photo. Although it is not required, this photo is used throughout *Vanishing Leaves* as your character image and, therefore, we recommend you give a big smile! You can always change this account image through the main ARIS menu located at the top left corner of the app interface.
- 3. TURN ON LOCATION SERVICES**

Once downloaded, you will need to give ARIS permission to utilize your device's location services. If you are not prompted for this permission automatically, you can grant it manually at the following location on your mobile device: Settings > Privacy > Location Services > ARIS. Select the "While Using the App" permission setting.

Note: Mapping applications can deplete mobile device's battery life, so make sure to charge your device fully before beginning game play!
- 4. PROVIDE ARIS ACCESS YOUR CAMERA AND PHOTOS**

When prompted, allow ARIS access to your camera and photos. These will be used during gameplay.
- 5. LOAD VANISHING LEAVES**

On the ARIS home screen, use the search icon at the bottom of the interface to search for "Vanishing Leaves." After locating the game, simply click on the icon for the game and then select "New Game" at the bottom of the screen. If you ever close ARIS or lose connectivity, simply open the app again; you will have the option to either "reset" and start again, or "resume," which allows you to continue play from where you left off.

Can't get to Brooklyn Heights? Search for "Vanishing Leaves: Play at Home" instead.



ARIS MOBILE IN THE APP STORE

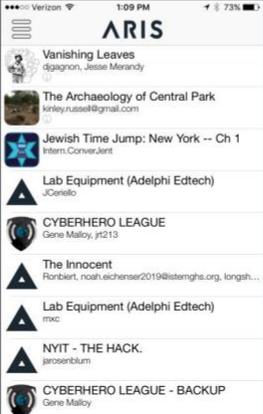


Fig. A18. Vanishing Leaves Instructions: Getting Started



OPERATION VANISHING
LEAVES

MISSION FILES

MISSION HOME

GETTING TO BROOKLYN HEIGHTS

Vanishing Leaves is designed to be played in Brooklyn Heights and requires players to travel to the location.

STARTING POINT

The game begins at Walt Whitman Park located in Brooklyn Heights between Cadman Plaza East and Adams St., and Red Cross Pl. and Tillary St.

The following address can be used for navigation purposes: 198-248 Brooklyn Bridge Blvd, Brooklyn, NY 11201.



PUBLIC TRANSPORTATION

The quickest and easiest way to travel to the starting point is to use the New York subway system. The closest stations are:

- A/C train to High Street
- 2/3 train to Clark Street

Once you exit the subway, turn on your ARIS app and use the game map to arrive at the starting point. For more information on using the ARIS app, please refer to the Game Play section.

[MTA Subway Map](#)

GAME SAFETY

This game requires walking in an urban neighborhood and is an active learning experience. Here are some important tips to help make your trip safe and enjoyable.

- Bring a layer, it can be cold by the river! Wear comfortable shoes.
- Be aware of your surroundings at all times. Please watch for moving vehicles and other pedestrians, observe all traffic signals, and use street crossings.
- Gameplay has been designed with ample "safe places" where you will be able to contemplate, write, reflect, and rest. Please use these spaces when you need, and resume the game when you are ready to proceed.
- Despite best efforts to plan an enjoyable learning experience, *Vanishing Leaves* and ARIS are not responsible for accident or injury that may occur during game play.

Fig. A19. *Vanishing Leaves* Instructions: Getting To Brooklyn Heights



OPERATION VANISHING LEAVES

MISSION FILES

MISSION HOME

GAME PLAY

BASICS OF THE GAMEPLAY

In order to save Walt Whitman, players must travel to set locations throughout Brooklyn Heights in search for the missing manuscript copy of *Leaves of Grass*. Using the main map interface, navigate your character icon (a pulsing blue dot) to the mission icons located throughout Brooklyn Heights. Once you have arrived at a location, tap the icon to interact with characters and undertake simple writing tasks in order to progress through the game. To proceed through these conversations simply follow the on-screen cues. Have fun out there and watch out for SNAKE!

MAP INTERFACE

THE MAP

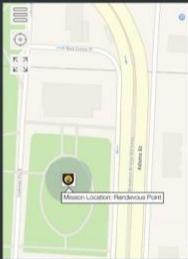
The map is the primary interface used during gameplay. Your location is marked by a pulsing blue dot which responds to your movements. Using this dot, navigate to the game locations marked by map icons. When tapped, these icons will trigger events and interactions with various game characters. Many of these location icons have a trigger range represented by a grey circle on the map. You must be within this circle in order to interact with these icons. You may find as you near a destination that it is necessary to zoom in on the map in order to gain a more detailed view of an icon's placement and its trigger range. If your blue player dot is not within range and you attempt to touch an icon, you will receive an onscreen alert informing you of the remaining distance you need to travel.

Hint: Familiarize yourself with the use of "pinch to zoom" finger gestures as you navigate the map.

MAP ICONS

Located at the top left of the map are three graphic icons:

- Main Menu:** The three horizontal lines icon (hamburger menu) gives you access to important mission information and also various tools you will need to complete the game. These items will be covered in more depth in the Mission Files and GeoUploads section of the tutorial. You can also return to the map or leave the game through this menu.
- Ballseye:** The bullseye icon recenters the game screen on your current location.
- Multi directional arrows:** This button frames both your location and the current game destination on the same screen. This is incredibly helpful if you don't see your destination on the map.

MAP INTERFACE SCREEN SHOWING THE MAIN MENU, AND PLAYER AND LOCATION ICONS.

MAIN MENU / MISSION TOOLS

The main menu or "mission menu" is your essential tool kit during gameplay and also allows you to exit the game. The main menu is accessible from the map screen at any time by touching the three stacked horizontal lines icon.

MAP

The map icon will always take you back to the main map interface.

MISSION FILES

Throughout the game you will receive important information regarding the locations you visit and the people you meet. When you receive a new mission file you will receive an onscreen alert. That file can then be accessed in the mission files section of your game menu at any time.

GEUPLOADS

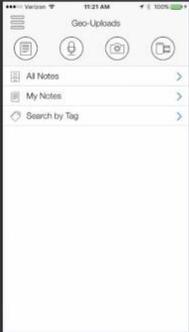
GeoUploads are composing tasks which you must complete in order to advance game's storyline. There are three types of uploads: text, photo/video, and audio.

Detailed directions about GeoUploads can be found in the [GeoUpload brief](#).

LEAVE GAME

At the bottom of the main menu is an option to leave the game. You can always return and resume your progress.





MAIN MENU
MISSION FILES MENU
Geo-UPLOADS MENU

Fig. A20. Vanishing Leaves Instructions: Gameplay

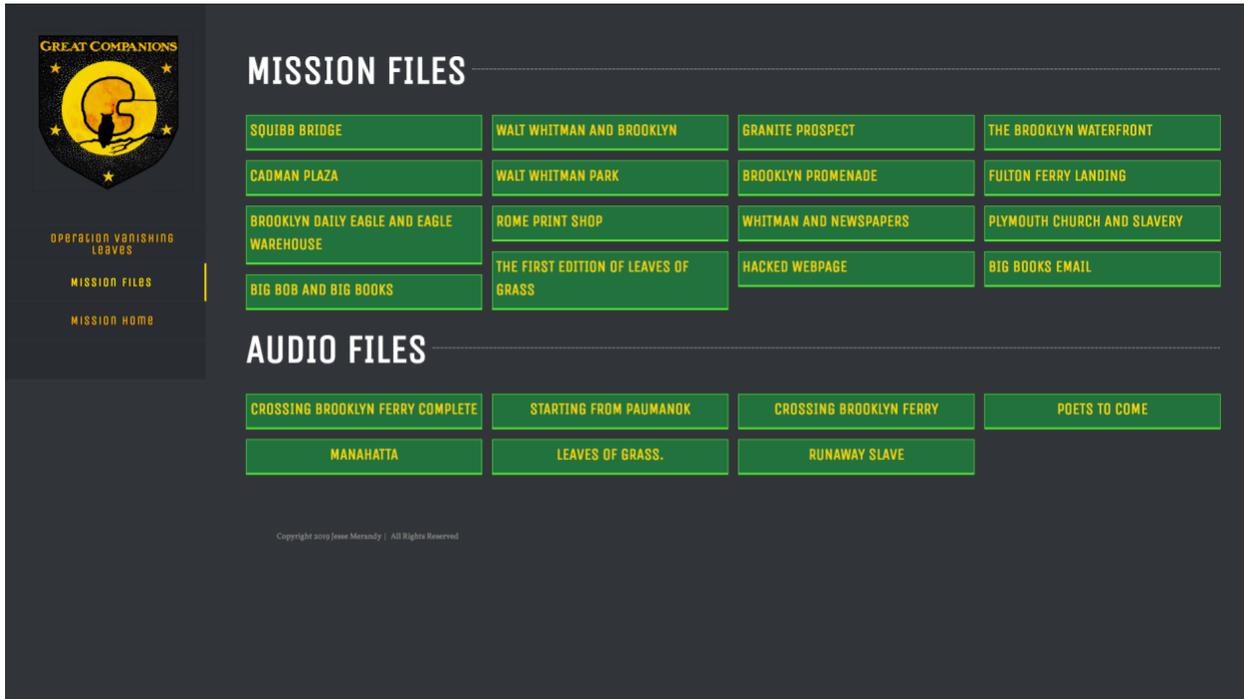


Fig. A21. Vanishing Leaves Mission and Audio Files Repository.

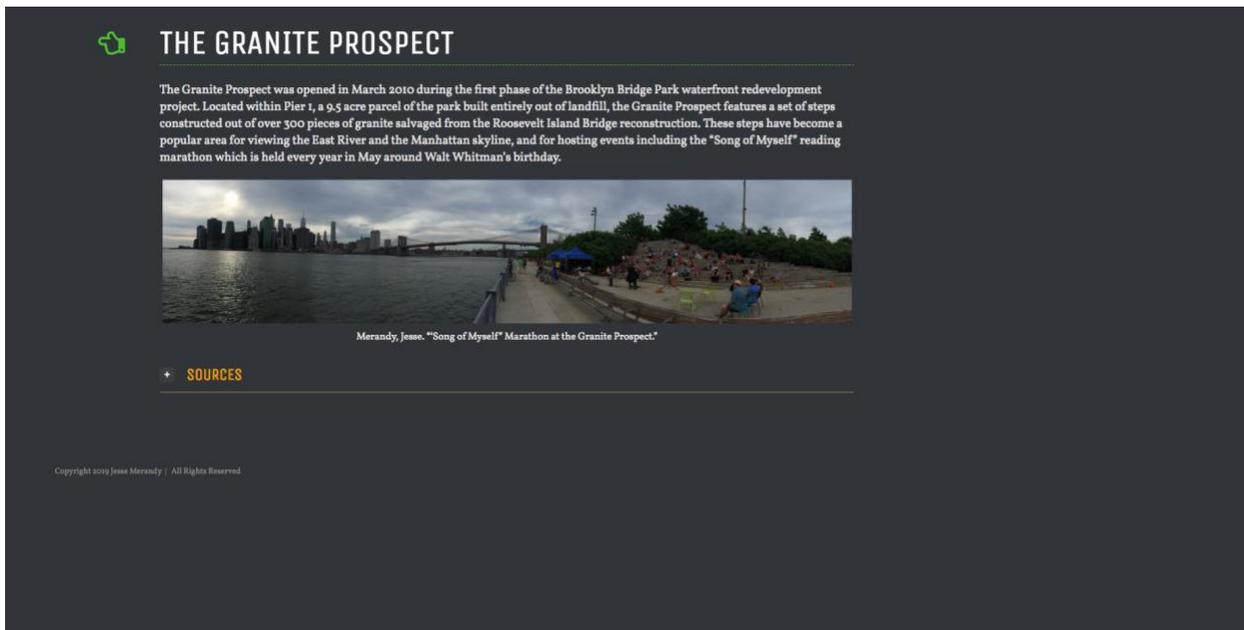
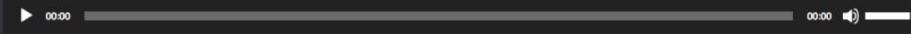


Fig. A22. Vanishing Leaves Mission File Example



POETS TO COME

"POETS TO COME." (1871)



POETS to come! orators, singers, musicians to come!
Not to-day is to justify me, and answer what I am
for;
But you, a new brood, native, athletic, continental,
greater than before known,
Arouse! Arouse—for you must justify me—you must
answer.

2 I myself but write one or two indicative words for the
future,
I but advance a moment, only to wheel and hurry back
in the darkness.

3 I am a man who, sauntering along, without fully stop-
ping, turns a casual look upon you, and then
averts his face,
Leaving it to you to prove and define it,
Expecting the main things from you.

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Fig. A23. Vanishing Leaves Audio File Example

VANISHING LEAVES:

A STUDY OF WALT WHITMAN THROUGH LOCATION-BASED MOBILE TECHNOLOGIES

By Jesse Alan Merandy

DISSERTATION COMPONENTS:

- *Vanishing Leaves* Location-Based Mobile Experience
- *Vanishing Leaves* Whitepaper
- *Vanishing Leaves* Game Script
- *Vanishing Leaves* Technical Information and Archive (to be completed for deposit)
- Acknowledgements

DISSERTATION COMMITTEE:

Matthew K. Gold (Chair and Advisor)
Sondra Perl
Stephen Brier

A dissertation submitted to the Graduate Faculty in English in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2019

NOTE TO SITE VISITORS:

Much of this dissertation is not found within the pages of the following whitepaper, or on this website. It can not be read, or viewed, or approached as you would a traditional scholarly work. Instead, this dissertation is meant to be experienced! After you have read this document, follow the instructions at <http://gr.vanishingleaves.com> to download the game, find your way to Brooklyn Heights, and spend some time with Walt Whitman.

Can't get to Brooklyn Heights? Go to the "Getting Started" page, follow the instructions, and play the "Vanishing Leaves: Play at Home" version.

WHITEPAPER

ABSTRACT

Vanishing Leaves is a location-based mobile experience (LBME), which employs mobile devices equipped with GPS and high-speed wireless internet capabilities to take users to Brooklyn Heights to learn about the poet Walt Whitman and his connection to the neighborhood where he lived, worked, and published the first edition of his masterwork *Leaves of Grass*. Through this active first-person immersive learning experience, *Vanishing Leaves* embraces experimental scholarly methods, ones that extend outside the classroom and off the page, in order to engage learners and to invite them to create meaningful, personal connections to writers and their literary works.

The accompanying whitepaper details the core concepts and inspiration underlying the development of *Vanishing Leaves*, including Whitman's mobile composing practices and lococomposition theory and its exploration of the dynamic relationship between the writer, their discourse, and the environment. Following this groundwork, a detailed examination of the capabilities of mobile devices relevant to this project is offered. This analysis highlights important research, concepts, and existing projects that illuminate the potential for LBMEs to help us better understand cultural figures, their historical contexts, and the important connection between place and discourse surrounding cultural texts. Finally, an overview of the development of *Vanishing Leaves* will provide details regarding its methods and objectives, as well as some of the major challenges and lessons learned throughout the process.

CLICK TO DOWNLOAD
COMPLETE WHITE PAPER
(PDF)

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Fig. A24. White Paper Website

Appendix D: Readme

Digital Manifest:

Whitepaper, Appendices and Readme:

- Whitepaper
- Readme
- Gameplay instructions and walkthrough video
- Game audio files
- Game Script pdf

ARIS:

- ARIS repo
- ARIS DB Dump

Websites:

- Vanishing Leaves Game Website (<http://gc.vanishingleaves.com>): SQL, XML, WP, JSON Files
- White Paper Website (<http://vanishingleaves.com>): SQL, XML, WP, JSON Files
- WebRecorder WARC of: <http://gc.vanishingleaves.com>, <http://vanishingleaves.com>
- Wordpress 5.1.1
- Avada Theme 5.8.2

A Note on Technical Specifications

The *Vanishing Leaves* location-based mobile experience is built on the ARIS platform. This platform has three core components: a server, which hosts the games and stores their assets; an editor, which is used to create the games; and a client, which users download to their devices to play the games. Each of these components, along with documentation for bringing up a self-hosted ARIS installation, is maintained at the ARIS games Github repository. The *Vanishing Leaves* game data, which lives on the server, has been exported and archived. As a supplement to this archive, the game's script and multimedia files, as well as a video of the *Vanishing Leaves* gameplay, have been archived separately.

In addition to the ARIS platform components, *Vanishing Leaves* also has two accompanying websites. The first is a companion website, which provides instructions on how to download and play the game, and acts as a repository for the historical information and audio files delivered during gameplay. The second website is the scholarly companion to the game, which makes the dissertation whitepaper and supplemental materials related to the game development available online. Both of these websites are built on the Wordpress CMS platform and use the Avada premium theme for design and layout. Each website's database and file contents have been archived. In addition, WARC files have been created using Webrecorder as a supplemental archive.

ARIS

ARIS License

ARIS Games is open-source under the MIT license and free to use. The MIT License is a permissive free software license.

Github repository: <https://github.com/ARISGames>

ARIS Games is composed of the following components:

1. **ARIS Server:** ARIS experiences live on a database in the cloud. This includes all of their assets and user-generated content. The client and editor read from and write to it.
<https://github.com/ARISGames/server/blob/master/README.md>
2. **ARIS Editor:** The editor is used to create ARIS experiences.
<https://github.com/ARISGames/jsEditor/blob/master/README.md>
3. **ARIS Client:** The client is used to play ARIS experiences and collect user-generated data. The Client is downloaded onto player's mobile devices.
<https://github.com/ARISGames/iOSClient/blob/master/README.md>
Current App on iTunes (v 2.6.1): <https://itunes.apple.com/ca/app/aris/id371788434?mt=8>

Server Requirements & Install:

- php 5.3
- Mysql
 - Copy config.class.php.template to config.class.php
 - Modify to point to your mysql databases and app directories.
 - Import services/v2/db/upgrades_table.sql into your v2 database.
 - Visit <aris server>/services/v2/autocrud/index.html
 - Use autocrud to GET `db.upgrade` to create all aris tables.
 - Register a user in the database and play with the API!

Editor Requirements & Install:

- less 2.5.1 npm install -g less
- require.js 2.1.10 npm install -g requirejs
- jquery 1.10.2
- marionette 1.4.1
- backbone 1.1.0
- underscore 1.5.2
 - Copy scripts/config.js.template to scripts/config.js and modify to your server preferences.
 - Run make build which will compile css, run the r.js optimizer to unify all modules, and build index.html from index.html.template and the above config file.
 - Building requires:
 - Make
 - Bash
 - LessCSS
 - Require.js (R.js optimizer tool)
 - sha256sum (Installed on OSX/Linux by default)
 - Install these however you wish. For development you can install node.js and then npm install from the project folder. Then add ./node_modules/.bin to your path.

App Requirements

Requires iOS 8.0 or later. Compatible with iPhone, iPad and iPod touch.

Wordpress

Content Management System used to power both:

- <http://vanishingleaves.com/>
- <http://gc.vanishingleaves.com/>

Wordpress 5.1.1

Requirements: Servers running PHP version 7.3 or greater, MySQL version 5.6 OR MariaDB version 10.0 or greater. Apache or Nginx recommend as the most robust options for running WordPress, but neither is required.

WordPress Licensing

WordPress is distributed under the GNU General Public License

Avada Theme 5.8.2

Avada is a premium theme purchased from Themeforest.net

http://preview.themeforest.net/item/avada-responsive-multipurpose-theme/full_screen_preview/2833226

Requirements

WordPress 4.6 or higher, PHP 5.6 or higher, and MySQL 5.6 or higher (for legacy environments also PHP versions 5.3.x will work but it is recommended to be on at least PHP 5.6 and more preferably PHP 7.0+ WordPress recommends PHP 7.3 at minimum).

Server Settings for *Vanishing Leaves* Website components

- Apache Version:2.4.38
- PHP Version:7.0.33
- MySQL Version:10.1.38-MariaDB
- Architecture:x86_64
- Operating System: linux
- Perl Version: 5.16.3

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