

**LOCI:
Creative AR Visualization of
Overlooked Narratives in Familiar Spaces**

Joshua Okoro

THESIS

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Zach Duer, Committee Chair

Meredith Drum, member

Thomas Tucker, member

Nathan King, member

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Abstract

This thesis explores the use of location-based augmented reality to transform our perception of the built environment. In the artwork, the historic Armory building in the Town of Blacksburg which serves as home to the School of Visual Arts (SOVA) at Virginia Tech is used as a locus of changing functions, social impact, and evolution. In this case, its history is used to creatively visualize the overlooked narrative in familiar spaces through augmented reality (AR) murals. AR is an artistic medium that unveils rich hidden histories, sparks conversation, and promotes deeper connection between people and places. I drew inspiration from contemporary artists such as Brian Peterson, the social narrative of the WPA mural initiative, and Kandinsky's vibrant abstract work. The project utilizes Google's ARCore framework in the Unity game engine as well as Google's Geospatial API with the aim to creatively reveal hidden narratives in places and promote positive social engagements.

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General Audience Abstract

Augmented reality (AR) has increasingly become popular and social media applications like Instagram and Snapchat and more immersive mixed reality headsets like the Meta Quest 3 has allowed people all over the world to connect in unique ways and have shared unreal experiences. AR allows digital visuals to exist and blend with the space around us. For me, this unlocks the potential to create new forms of artworks, to creatively display those unreal or forgotten events that have happened in the past and because it is AR, they can exist right at the space they once occurred. One benefit of this is that it can be applied to any space, landmarks, or obscure places, and can be used to pull people together to engage in new ways. After looking at works from other artists; muralists, painters, AR artists, I created an AR mural artwork to creatively display the hidden narratives of the Armory building in Blacksburg Virginia. I used artistic and technical tools such as Adobe Illustrator, Photoshop, Google's AR technologies and Unity, a 3-dimensional and 2-dimensional game creation software to create the AR murals and lock it to the longitude and latitude of the space around the Armory building. One reason I chose this place as a point of reference is because its function has changed multiple times since its construction in 1936.

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Introduction

When I first arrived in Blacksburg Virginia, the history of the environment was in my face. I see symbols and structures that represent past events that happened within the space such as the painted blue line that crosses South Main Street near Sunset Boulevard¹ in Blacksburg which represents the Eastern Continental Divide. Another example are the 16 bronze frog figures placed strategically through the town to call attention to the freshwater under and around the streets and buildings of downtown Blacksburg.² The statue of Addison Caldwell, first student to enroll in Virginia Agricultural and Mechanical College now called Virginia Tech, and walk 28 miles to the campus³ and the former slave bathroom buildings close to the duck pond on Virginia Tech campus made me more interested in the events that happened around the environment and imagined a creative visual representation of such narratives of the past. As an artist, I felt the desire to reimagine and creatively display other hidden narratives using spatial tools that create an immersive experience, blends the physical and the digital and invites viewers to participate in the ongoing narrative of the environment.



Figure 2. Eastern Continental Divide



Figure 1. Millie the Frog. One of the 16 Frogs in Blacksburg



Figure 4. Addison Caldwell, first student to enroll in Virginia Tech. Walked 28 miles.



Figure 3. Historic Female Slave Bathroom. Adjacent to the Duck Pond at Virginia Tech.

The built environment - Space and Place

Human activities are what shape the meaning of spaces, one of the most fundamental ways humans shape spaces is through buildings. Space, in a sense of the word, refers to the distance between two points. It exists as a three-dimensional continuum where directions and positions are defined. Within this vast continuum, humans tend to compartmentalize entities and shape physical forms. These forms enable us to perform and conduct various activities, which often hold meaning or significance.

It is important to understand the distinction between 'space' and 'place.' Space provides the fundamental potential for a place to exist. As described by Harrison and Dourish – professors at Virginia Tech and University of California respectively, “Space is a natural fact and place is a social product, and a set of understanding that come about only after spaces have been

encountered by individuals and groups.”⁴ It is the meaning and value we derive from a space that truly determines the kind of place it becomes, and a major way we change spaces into places is through buildings. Consider an empty room: it could serve different purposes depending on the activities that people perform within it and the meaning those activities hold. If the people who use a space decide it is for storage, then it becomes a storage place rather than a place for something else, playground for example. The intended use then dictates what objects are placed within the space. As a result, others will recognize it as a place for storage and not a place for play.

Importantly, space is dynamic: it can hold different meanings simultaneously for different people. Further, the meaning of a single space can shift over time. A space might offer a place to boost energy in the morning by drinking coffee yet become a place for rehabilitation in the evening. It could be a place for one person to enjoy coffee while simultaneously serving as a study space for another. The activities performed within a space at a given time determine the kind of place it is.

Buildings evoke the history of activities and interactions within their spaces. When I look at a building – whether it is a shopping mall, a school, or any place where people gather – I see more than the physical structure and the current activities happening within it. I also wonder about the past: what activities did this space facilitate in earlier times? What memories linger within its boundaries?

I am interested in using augmented reality to reveal the layers of activity and memory within a space. The built environment is a vast repository of layered narratives, where human culture, experiences, history, and traditions intersect. Each structure, from ancient ruins to towering

modern skyscrapers, holds stories of the past that reflect social, economic, and architectural transformations over time. I am fascinated by buildings with rich historical significance. The augmented reality artwork I created serves as a creative lens through which to visualize the memories embedded within a built space. It offers



Figure 6. Squires Building Virginia Tech. Blacksburg, VA
Source: <https://www.pinterest.com/pin/squires-student-center-virginia-tech--57491332713687536/>

a unique way to experience and gain insight into this rich heritage. Augmented reality allows us



Figure 5. Solitude. Virginia Tech. Blacksburg, VA
Source: <https://www.vt.edu/about/arts/public-art/solitude-and-fraction-house.html>

to creatively present the layered narratives of the built environment, giving us a tangible connection to the past. For this project, I am using the Armory building in Blacksburg as a case study. I am using its history to create digital mural art pieces, digitally layered through augmented reality

around the Armory building. I considered other buildings in Virginia Tech campus such as Squires, the student center with facilities such as ballrooms, a 510-seat theater, a food court and dining areas, various activity rooms, meeting rooms, an art gallery, lounges, music and theater production spaces, offices, and practice rooms for the music department.⁵ Solitude was considered. It dates to more than two hundred years and is the oldest



Figure 7. Carol M. Newman Library. Virginia Tech, Blacksburg VA
Source: <https://theclio.com/entry/30592>

structure on campus⁶ and New Man library. The Armory, one of Blacksburg's historic buildings⁷ stood out to me because of its dynamic history - changing functions, social impact, and evolution as a place over different period.

The Armory, as a changing place

The Armory, now the home of Virginia Tech's School of Visual Arts, is a place where creatives of all kinds – students, professors, artists, and art lovers – come together to collaborate, create and exhibit art.⁸ The building offers two distinct exhibition spaces: a dedicated art gallery,

focused on the presentation of work created by national and regional artists with an emphasis on the educational role of a University Gallery as a teaching tool⁹ and the



Figure 8. Armory Building, September 18th, 2023

mezzanine overlooking the basement level. While the basement now serves as a classroom and practice area, the mezzanine functions as an extension of the gallery, displaying the work of students and artists alike. Administrative offices and student studio spaces surround these areas, making the Armory a lively hub of creative activity.

The Armory's allure also lies in its rich history – its past and the evolving meaning it has held for its occupants and the community. Currently owned by the Town of Blacksburg and leased to Virginia Tech, the building's functions have changed dramatically over time. Today, it is an

artistic space for university students, but its past tells a different story. It has served as a gymnasium for high school and elementary students, providing a place for exercise and sports. The basement was once a basketball court, alive with the energy of student athletes. It even welcomed audiences from across Blacksburg as a performance space, hosting notable artists on a stage that has since been replaced by offices and studios.

Going even further back, the Armory was exactly what its name implies – an armory where the National Guard trained. In fact, its original purpose was entirely military, not academics or art. The Armory is a testament to transformation – a building whose function, value, and the very nature of the work performed within its walls have shifted remarkably over the years.

Reimagining Place Through AR

I used location-based augmented reality as the medium to display an artistic rendition of the layered, hidden narratives within the Armory building. AR allows me to place artwork around the Armory's space. The digital artwork creatively reveals meanings and functions the building has held over time. Through this location-based AR art experience, I invite audiences to become active participants, contributing to the rich, unfolding history of this unique space. AR is a medium well suited to this practice. AR is an emerging technology with its own challenges, but its potential is vast. Recent innovations show its ability to create digital spaces and entities that would be difficult, if not impossible, to achieve with traditional physical materials. AR blends digital space with physical space. It layers multiple spaces together, making it useful for visualizing hidden narratives and layering them in a space where we perceive them physically. AR makes it possible to create interaction between different elements of the art piece, giving more dynamism and enriching the communication of the artwork. Artists sometimes extend

physical murals as seen in figure 9. I took cues from the article, An Investigation of the Use of Augmented Reality in Public Art by Tamlyn Young, an illustrator, and visual artist who lectures at Limerick University Ireland and Mar T. Marshall who specializes in Human-computer interaction and lectures at the same. To promote engagement, in their paper, they recommend that “AR-enabled public artworks be designed specifically to consider the physical, social, and historical aspects of the sites in which they are to be placed. Also, AR can add a level of novelty, increase interest, and can also be used to tell stories.”¹⁰



Figure 9. (top) The mural for the Waterford Walls festival work (bottom) A still image from the augmented reality layer on top of the mural. The complete AR content can be seen in Video S3.
source: <https://doi.org/10.3390/mti7090089>

A good example of an AR geospatial artwork that adds to the built environment is CENTO (2023), an interactive AR “creature,” which is a 3D art piece that hovers over the eighth floor at the Whitney Museum in New York. It was created by an interdisciplinary artist, Nancy Baker Cahill, whose art spans across new media art mediums. She is the founder of 4th Wall, “a free augmented reality (AR) public art platform exploring resistance” and features “inclusive creative expression, geolocated AR land art, curated AR exhibitions, and collaborative projects with artists around the globe.” Her aim is to “challenge traditional conventions of public art and introduce a participatory, immersive art experience,”¹¹ which is closely related to my aim for Loci. CENTO invites people all over the world to participate by “adding feathers through the 4th

Wall app to the creature,”¹² which makes them co-creators of the work and then invites them to experience the immersive artwork in person at the Whitney Museum.

In my work, I reveal the narratives of a place, not by extending physical mural but by creating a geospatial AR mural that stands independently in three-dimensional space just like CEN^{TO}, and reveals the



Figure 10. video frame of the painter interacting with the helmet

connection between the present function, and the first function of the place, which is the Armory. The interaction of the painter and the helmet in my work demonstrates this (figure 10).

Research and Inspiration

Murals and the Built Environment

Part of this work is an exploration of what a mural is. Murals are usually large-scale artworks painted directly on buildings (see figure 11) “that speak to us, observe, shame, or wink at us.”¹³ Murals have long been a powerful medium for artists to communicate and promote social engagement and cultural heritage, which made me explore the potential of augmented reality to

extend this tradition. Murals communicate the memories and meanings surrounding events and activities within a space.

Murals attract people's attention.

The space – that is the building –

enables the creation

of murals. Their size

and scale often



Figure 11. Mural on large building. Mural depicts three heroes for the Scholarship Prep Elementary in Downtown Santa Ana by Brian Peterson
Source: <https://www.brianpetersonart.com/murals/scholarshipprep>

envelop the structures they adorn. The process of painting murals involves the use of large space, which is a huge scale difference when compared to making artwork on most canvases or painting on digital screens as I have done in my work – though through AR my digital illustrations are enlarged in the physical space. I drew inspiration from Brian Peterson mural works as they are good examples of murals that spark social commentaries, evoke contemplations, and beautify public spaces. He transitioned from being an award-winning automotive designer,¹⁴ to taking advantage of the scale of a building, making his artwork bold, more conspicuous. He began by reimagining how homeless people look and painting them in a more glamorous style on a hand sized canvas and then transitioned to painting murals on large buildings. His murals cite an example of the social impact Loci aims for.

The Armory and the W.P.A. Murals

The Armory building has an indirect relationship with the murals created during the great depression era, which makes it a more suitable art style for this project. The United States Government response to the Great Depression in the 1920s and 1930s led to the commissioning of artists to make artworks through a federal grant program for social and economic stimulus. Federal programs like the Federal Art Project (F.A.P.) of the Works Progress Administration (W.P.A.) and Treasury Relief Art Project (TRAP), provided vital economic support for unemployed artists which led to the emergence of thousands of artists and creation of thousands of artworks,¹⁵ and they were majorly murals. Beyond the financial relief it provided artists, and according to National Park Poster, the murals that emerged from this initiative also drew public interest to various national parks such as Yellowstone National Park and “celebrated the majestic landscapes of America.”¹⁶ It led to the creation of thousands of murals nationwide¹⁷ which included stylized, bright, and bold paintings of national parks. The murals helped highlight the beauty around in a time of great despair leading to the increase of park visitations, a number that rose from around “170,000 visits in 1930 to 450,000 visits by the end of the decade.”¹⁸ A good example of murals that emerged from that era is The History of Medicine in California, a ten-panel mural painted by Bernard Baruch Zakheim in 1938, who was a San Francisco artist born in Warsaw Poland. The art technique used for the artwork was Fresco, defined by JerwoodVisualArts, an online art article and art resource, as a “painting technique that involves applying pigments mixed with water onto a layer of wet plaster, quickly before the plaster dries. This allows the pigments to become embedded in the plaster, which creates a durable and long-lasting work of art.”¹⁹ One of Zakheim’s art panels, which The San Francisco Historic

Preservation Commission in an August 2019 voted to recommend the frescoes be granted



Figure 12. Bernard Zakheim, *The history of medicine in California 1938*.
Source: <https://www.universityofcalifornia.edu/news/discovering-icon-plain-sight#:~:text=The%20fresco%20is%20one%20of,they%20tend%20to%20malaria%20patients.>

landmark status,²⁰ features a black nurse working with a white physician as they attend to malaria patients. He used murals to depict the history of medicine in California as the title of his work suggests and it is a good example of how

murals promoted cultural heritage and communicate past narratives in a place.

The interesting relationship between the Armory and W.P.A. murals which is worth noting is that at the time the United States Government through the W.P.A. commissioned artists to create

murals, it also

commissioned another

federal grant through

the Public Works

Administration

(P.W.A.) project to

build the then National

Guard Armory, as

place for training. The

Armory was



Figure 13. Armory Building. Date – unknown
Source: Town of Blacksburg VA - <https://www.blacksburg.gov/>

constructed in 1936, at the same period the Federal Art Project of the W.P.A. commissioned artists, and it was constructed for the same reason as economic stimulus though with different goals. I find it fascinating that the place, which was built for military purposes, has evolved to a place where art is created, what the W.P.A. aimed to achieve in the depression era. It seems fitting to use murals to communicate the dynamic history of the Armory. It is worth mentioning that various sources on the internet interchange the Works Progress Administration (W.P.A.) with the Public Works Administration (P.W.A.). The plaque at the entrance of the Armory building says the building was built as a federal Works Progress Administration project (figure 14). However, I obtained a document from Lorraine S. Spaulding, a Town of Blacksburg clerk, which states that the P.W.A. was the one that provided the funds and approved the building project. The document is a minute of a meeting held at the Governor's office on April 16th, 1936 (see figure 15)



Figure 14. Plaque at the Armory entrance

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DIVISION OF MILITARY AFFAIRS
THE ADJUTANT GENERAL'S OFFICE
RICHMOND, VIRGINIA

AMENDED RESOLUTION UNANIMOUSLY ADOPTED BY THE ARMORY
COMMISSION OF VIRGINIA AT A MEETING HELD IN THE OFFICE OF
THE GOVERNOR ON TUESDAY, APRIL 16th, 1936:

"Whereas, the Armory Commission of Virginia is advised that the Council of the Town of Blacksburg, Virginia, is desirous of constructing an Armory in the said town, in which Battery "G", 246th Coast Artillery (HD), Virginia National Guard, may be housed and trained; and

Whereas, the Armory Commission is desirous of having the said Armory constructed and to that end is willing to co-operate with the said Town by contributing to the said town the sum of ten thousand (\$10,000.00) dollars to assist in defraying the cost of the said armory;

Now, therefore, be it resolved that the Armory Commission of Virginia will, upon the conditions hereinafter set forth, contribute to the town of Blacksburg, Virginia, from the funds appropriated for the erection of armories, to be expended under the direction of the said Commission, the sum of ten thousand (\$10,000.00) dollard, to assist in the construction of an Armory in the said town:

(1) The Council of the Town of Blacksburg, Virginia, shall agree to construct an Armory in the said town; provided, however, the Federal Public Works Administration makes available the estimated amount which has been approved by it;

(2) The plans for the said Armory shall be approved by the Armory Commission of Virginia, The State Art Commission and The Council of the Town of Blacksburg;

(3) The entire cost of said Armory, including the real estate upon which the same shall be constructed, in excess of (A) the amount to be contributed by the Armory Commission of Virginia and (B) to be furnished by the Federal Public Works Administration, shall be appropriated or provided by the Council of the said Town of Blacksburg, Virginia;

(4) The said Armory shall be used for training of the National Guards and for such other purposes not inconsistent with law as shall be agreed upon by the Council and the Armory Commission of Virginia pursuant to the provisions of Chapter 373 of the Acts of the General Assembly of Virginia, 1932, and Amendments thereto;

Figure 15 minute of a meeting held at the governor's office.
Source: Town of Blacksburg VA - <https://www.blacksburg.gov/>

Abstracting the Armory

Since its construction, the Armory building has embodied different values and meaning for different people at separate times. To communicate this variety through mural, I took inspiration from Wassily Kandinsky's painting style, his use of abstract shapes, lines, and bold colors. His “work expresses emotions rather than simply depicting reality”²¹ as detailed in the Parkstone International published book about the artist titled, Wassily Kandinsky. For example, The Harbour 1916, a reverse painting on glass panel,²² one of his paintings, displays a colorful

background with swirling shapes and lines is in the style of abstract expressionism, an art movement that emerged in the mid-20th century and characterized using abstract forms and gestural marks to express emotion. The movement categorizes the spontaneous application of paints using techniques like dripping,



Figure 16. Wassily Kandinsky, *The Harbour* 1916.

Source: Parkstone Press International

splashing, and scraping. The work also employs abstract style, depicting the world in a non-realistic way. Abstract art can be completely nonrepresentational, or it can hint at recognizable objects or figures. I also wanted my digital murals to be a mix of abstract and representational depiction of the hidden narratives of the Armory which led me to use vivid colors, segmented by bold lines. Each block of color and shape in my artwork is a creative depiction that stems from my perception of the Armory building.

Synesthesia is a rare neurological condition that causes crossovers of the human senses. Those with this condition are reported to sense things in ways many people do not, for example, a person tasting colors or words, seeing a color or shape when they hear certain words. Just as synesthesia allows things to be perceived in a different form, though not directly similar, my art provides an avenue to visually sense hidden narratives that exist as memories of places. It is a popular opinion that Kandinsky may have experienced synesthesia. Shanley Chien Pierce, a freelance journalist alluded to this by quoting the artist, “Kandinsky later recollected in his 1911 book, *Concerning the Spiritual in Art*. ‘I saw all my colors in my mind; they stood before my eyes. Wild, almost crazy lines were sketched in front of me.’”²³ She also described it as “so powerful that it drove him to abandon a law career to attend art school at the Munich Academy of Fine Arts in 1896”²⁴ by referencing Kandinsky’s “sound of color” phrase, an expression the artist used to describe his experience. This Synesthesia allusion can be supported by critiquing the artist’s paintings and his lesser-known theater works, which are the “four stage songs: Green sound, Purple curtain, Black and white and Yellow sound,”²⁵ as detailed on an online article that captures the life and works of the artist. They also quoted the Kandinsky who mentioned that “the song should harmoniously combine music, color, plastic and word.”²⁶



*Kandinsky working on the painting *Dominant Curve*, Paris, 1936.*
Source:
<https://www.guggenheim.org/articles/checklist/synesthesia-a-visual-symphony-art-at-the-intersection-of-sight-and-sound>

Augmented Reality as a Medium

Like Kandinsky's use of music and paintings to display his perception, I researched how to use augmented reality to visualize the Armory's narratives through animated murals created with Adobe Photoshop, Illustrator, Krita, and technologies for developing AR. Unity offers AR packages for developing diverse augmented reality experiences, including Apple's ARKit, Google's ARCore, and PTC Inc.'s Vuforia. Unity's AR Foundation platform makes these frameworks available to artists and developers, allowing cross-platform development. For example, according to the 2018 blog post by Unity, AR Foundation provides a platform-agnostic scripting API and MonoBehaviours for making ARCore and ARKit apps that use core functionality shared between both platforms.²⁷ This allows the artist to develop their app once and deploy it to both devices without any changes.

For Loci, Google's ARCore framework was the ideal choice due to its Geospatial API feature. This API can be integrated into almost any ARCore project and enables developers to bind digital assets, such as 3D objects, 2D illustration or Sprite – 2D media in Unity, to physical locations using their longitude and latitude coordinates from Google Maps. Artists and developers have explored the potential of this tool, one of them can be seen in this video uploaded on YouTube by BitCrushingCog. In the Map prototype video, the presenter demonstrated adding 3D objects to physical space,²⁸ places such as stores and restaurants, helping with navigation and brand discovery. The Geospatial API allows artists to place anchors and 3D content with remarkable accuracy anywhere covered by Google Street View. This technology empowers me to tell the stories of the Armory as a place and draw attention to the

building itself. Crucially, since the platform is digital, the mural can live on and evolve in tandem with the Armory's ever-changing narrative.



Figure 17. Wassily Kandinsky, *Composition X* 1939



Figure 18. Joshua Okoro, *Unnamed* 2024

Data Collection

The Armory's story echoes the narratives of other built environments, even human stories. The building symbolizes resilience, adaptability, and a deep commitment to community – a fact supported by both written and oral histories. Seeking a deeper historical understanding to inspire my artistic process, I turned to the Town of Blacksburg and received immense help from Lorraine Spaulding. This led me to discover records of past events spanning decades. I also conducted interviews with individuals who have worked and created art within the space: Deb Sim, former curator and exhibition designer at the Armory Gallery, Dr. Ann-Marie Knoblauch, the current head of SOVA department, and Ray Kass emeritus professor of art in SOVA from 1976 to 2003.

According to Kass, the 1980s marked a crucial turning point for the Armory. SOVA department at the time faced a space constraint at their previous location, Owens Hall, which is presently a

campus dining hall. This initiated SOVA's move into the Armory building. He recalls the extraordinary adaptation of the Armory building for artistic use. This was not just a renovation, but a complete transformation of the space (see figures 24 and 25) to create dedicated places for offices and studios. As SOVA moved into the building, it became a place purposed for artistic expression. Covered windows were reopened, flooding the expansive gallery space with natural light until a mezzanine was later built in 2007 as recounted by Ray Kass and Eric Standley, an internationally recognized artist²⁹ and presently a professor at SOVA for two decades. I had the privilege to view the mezzanine design blueprint (figures 19, 20, 21, 22 and 23) which Eric provided and compare the structural change of the place with the original Armory blueprint (figures 26 and 27). The mezzanine design images detail the demolitions, and the partition that divides the gallery into two floors, offering an additional second floor for teaching and exhibitions, a part of which is the present Armory Gallery.

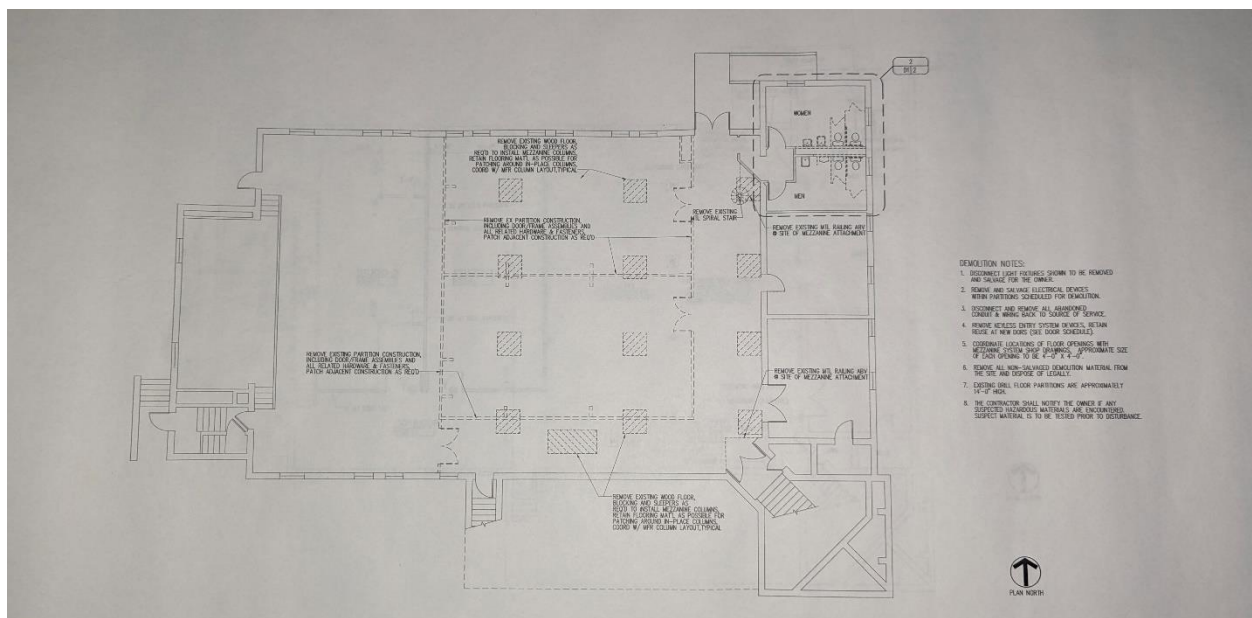


Figure 19. Armory building demolition plan, 2006
Source: Eric Standley, School of Visual Arts Department, Virginia Tech

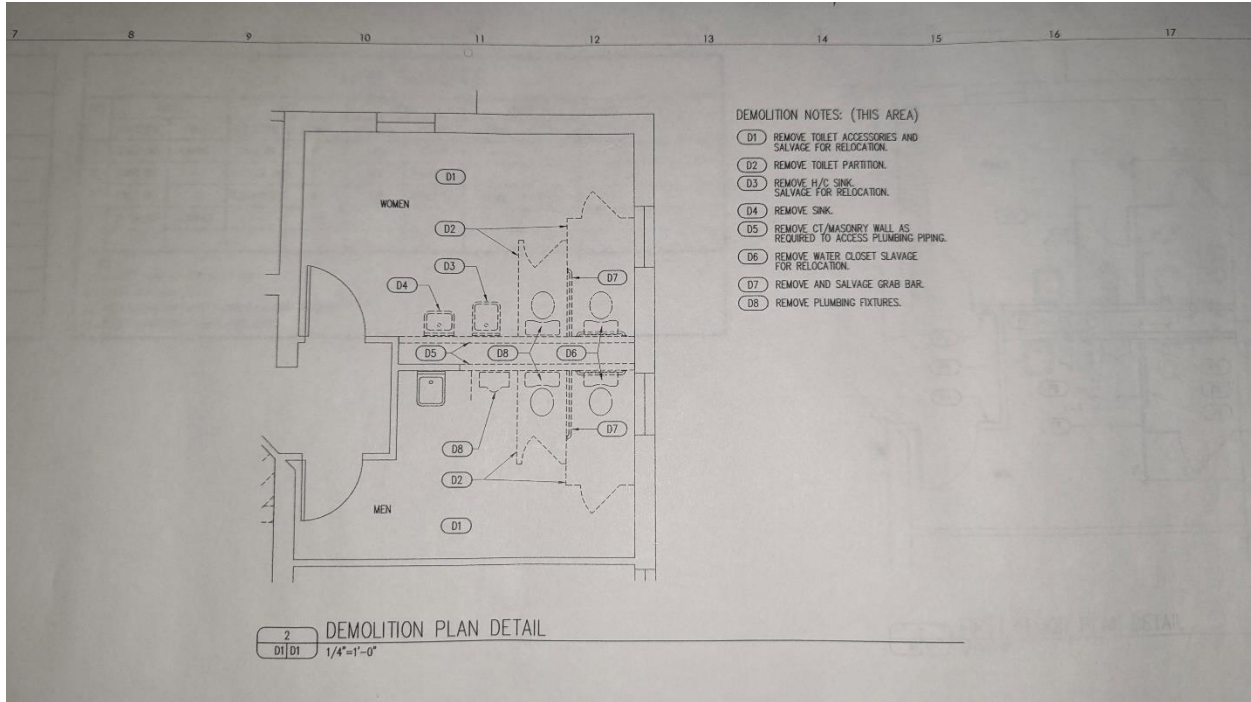


Figure 20. Armory building demolition plan, 2006
 Source: Eric Standley, School of Visual Arts Department, Virginia Tech

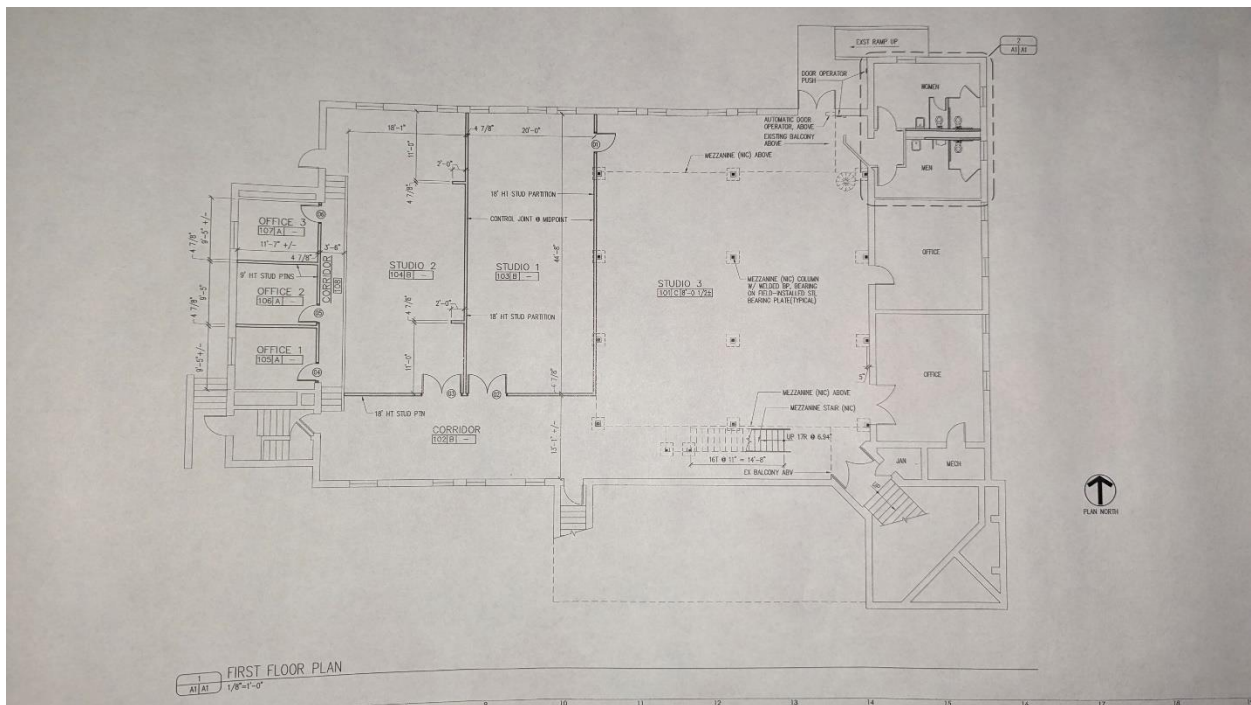


Figure 21. Armory building mezzanine addition, 2006
 Source: Eric Standley, School of Visual Arts Department, Virginia Tech

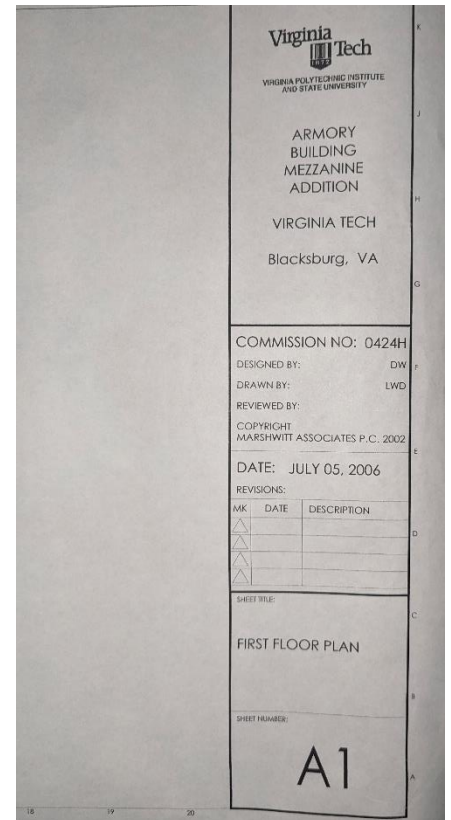
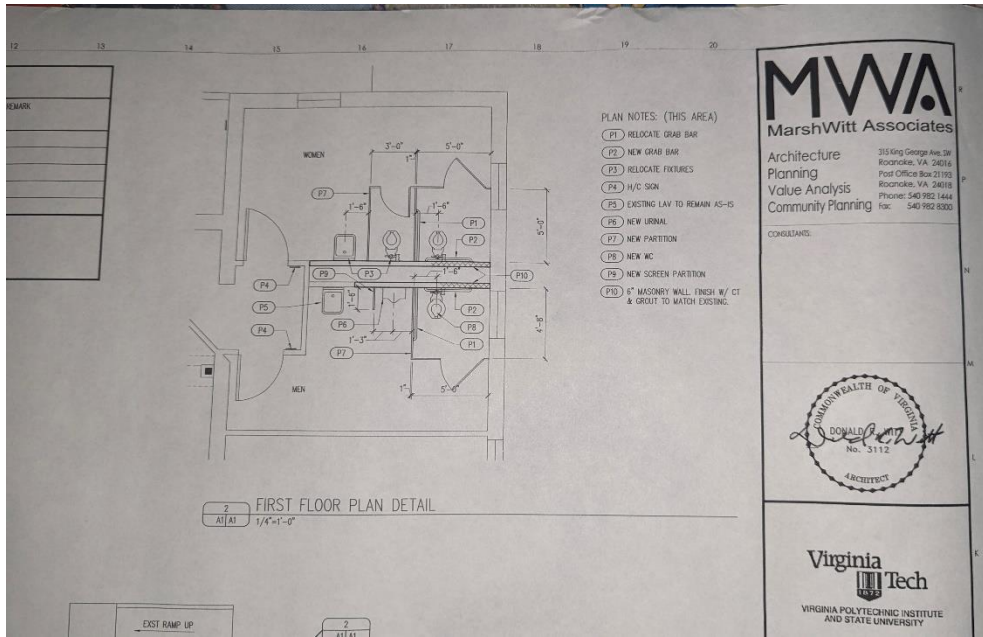


Figure 23. Armory building mezzanine addition, 2006
 Source: Eric Standley, School of Visual Arts Department, Virginia Tech

Figure 22. Armory building mezzanine addition, 2006
 Source: Eric Standley, School of Visual Arts Department, Virginia Tech

Kass told how the building’s basement was a basketball court for the then elementary and high school of Blacksburg, the influence a high school basketball coach Bill Foster had on his students, and how musicians such as by John Cage performed in the arena pulling audiences from around Blacksburg. Deb Sim took me to the former coal furnace that once heated the building, and like Kass’s account, she vividly described how the Armory uplifted the town's spirit with musical concerts, recounting how notable artists like Doc and Merle Watson drew crowds to the place. She explained that the open expanse of the basement, now filled with offices and studio rooms, once boasted a stage where artists performed. She was not just providing historical facts; she was sharing the soul of the building, its significance to people at a separate time.

**Department of Historic Resources
Reconnaissance Level Survey**

Montgomery

DHR Id#: 150-0027

Resource Identification

Other Id#: 150-0108-0236

Property Name(s): VPI Art Department, 201 Draper Road
{Function/Location}
National Guard Armory {Historic}

Property Date: ca 1931

Address(s): 201 Draper Road {Current}

County/Independent City: Montgomery

City: Blacksburg

State, Zip: Virginia 24060

USGS Quad Name: BLACKSBURG

Surrounding area: Town

National Register Eligibility Status

Property is Historic (50 years or older)

Property has not been evaluated

This Property is associated with the Blacksburg Historic District [district]

Resource Description

Ownership Status: Private

Acreage: 0.5

Resource is open to the public

Primary Resource Exterior Component Description:

Component	Comp Type/Form	Material	Material Treatment
Roof	Roof - Parapet	Metal	Roof - Standing Seam
Structural System	Structural System - Masonry	Brick	Structural System - 5-course Americ
Foundation	Foundation - Solid	Concrete	Foundation - Poured
Windows	Windows - Casement	Metal	Windows - Multi-light
Windows	Windows - Fixed/awning	Metal	other

Site Description: (2006) The building stands on a large lot surrounded by paved parking lots and other buildings.

Secondary Resource Desc: There are no secondary resources.

WUZIT Count:		
No.	Wuzit Types	Historic?
1	Armory	Contributing

NR Resource Count:		
#	NR Resource Type	Contributing Status
1	Building	Contributing
Contributing: 1.00 Total: 1.00		

Individual Resource Information

WUZIT: Armory

Est. Date of Construction: 1931 ca {Written source/site} Accessed? No Not accessible

Primary Resource? Yes Number of Stories: 1.0

Architectural Style: Other Condition: Good

Interior Plan Type: Other Threats to Resource: None Known

Description: (2006) This one-story brick building with basement consists of a central gable-roofed section flanked by one-story flat-roofed wings.

(1986) Soldier course bond marks the second floor level. There are corbelled brick cornices, and niches for lights flanking the principal entry. There is band and parapet coping, fluted pilasters flanking the principal entry supporting a dentilled entablature bearing inscription "ARMORY." An octagonal lobby behind the entry gave access diagonally and down stairs to the two-story auditorium.

(2006) Most windows have metal casements, although there are metal 4/4 awning windows on the basement level. The double-leaf, metal-framed glass entrance doors are not historic.

Cemetery Information

Report generated 3/9/2007

Figure 24. Blacksburg Architectural survey update, August 2nd - 4th, 2006
Source: Town of Blacksburg VA - <https://www.blacksburg.gov/>

AR FILE #: 150-0027

Page 2

Seq	No of Wuzits	H	NH	UD
1.0	1 classrooms, offices	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

EXTERIOR MATERIALS AND TREATMENT Component	#	Type/Form	Material	Material Treatment
Foundation				
Struc. Systems		masonry	brick	6-course American
Doors				
Windows				
Roof		gable shallow pitch	composition	roll
Chimney(s)				

INDIVIDUAL RESOURCE DATA

WUZIT: classrooms, offices PRIMARY RESOURCE? Y N

Estimated Date of Construction: ? Source of Date: On-Site Other

Architectural Style/Derivation(s):

ARCHITECTURAL DESCRIPTION

Soldier course marking second floor level, corbelled brick cornices, indentation for lights flanking principal (Draper Rd.) entry, band and parapet coping, fluted pilasters flanking principal entry supporting dentilled entablature bearing inscription "Armory", metal casements. An octagonal lobby behind the entry gave

Condition: Excel Fair Good Good-Exc Good-Fair Deter N/A Poor ReBlt Remdld Ruins
 Threat: NONE KNOWN None Demo Deter Develop MajAlt Negl PubUtExp Reloc StrFlr Trans Vacant

ADDITIONS AND ALTERATIONS DESCRIPTION

The building had been altered through the years. In 1983 walls and portions of the octagonal lobby were torn out and cubicles, partitions, bleachers, and a steel spiral stair were added when the building was converted to school use. Exterior paint was stripped soon after.

Figure 25. Blacksburg Architectural survey update, August 2nd - 4th, 2006
 Source: Town of Blacksburg VA - <https://www.blacksburg.gov/>

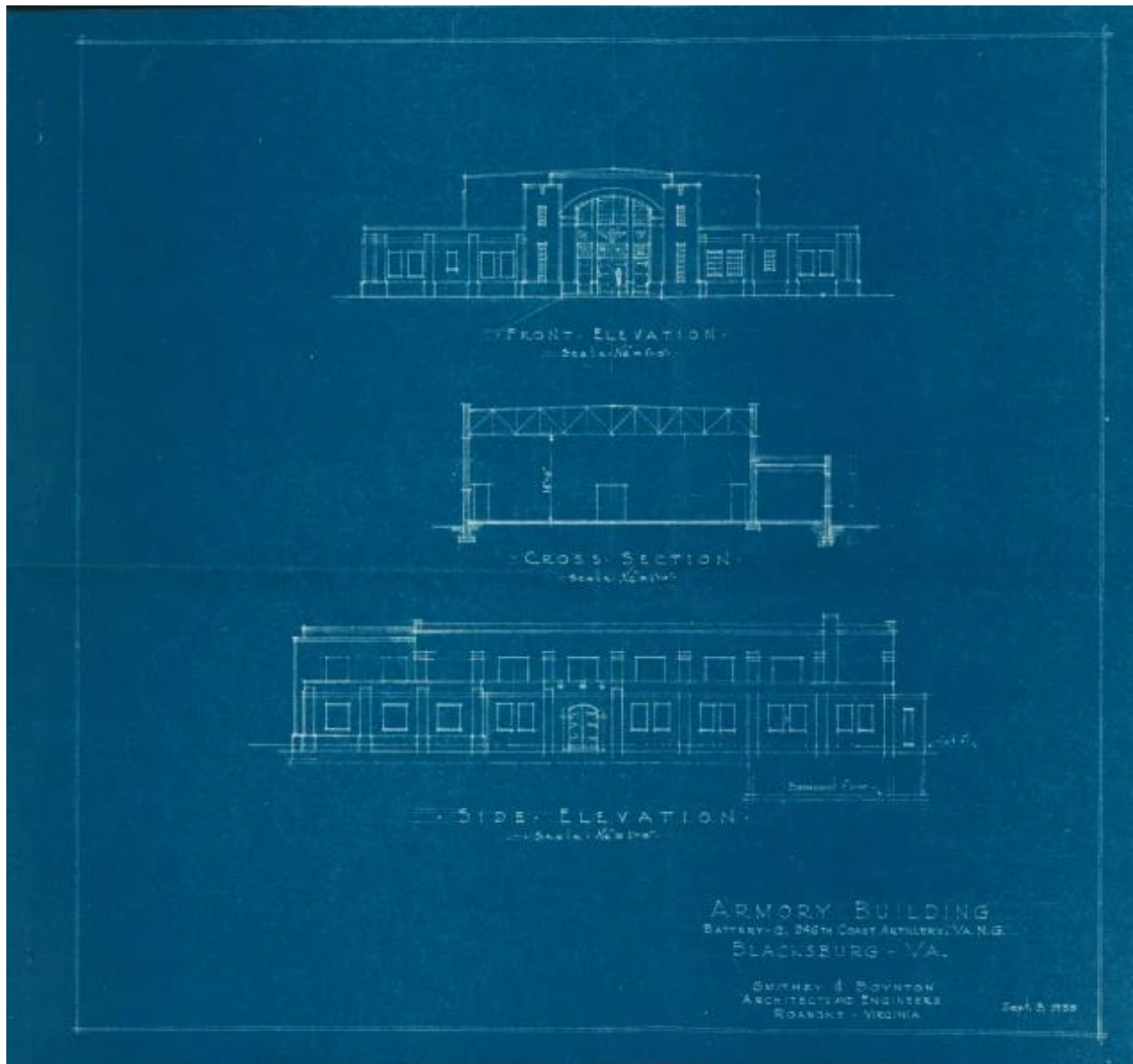


Figure 26. Armory Building in Blacksburg, designed by Smithey & Boynton.
Source: <https://scuablog.lib.vt.edu/2019/06/14/the-life-and-architecture-of-smithey-and-boynton/>

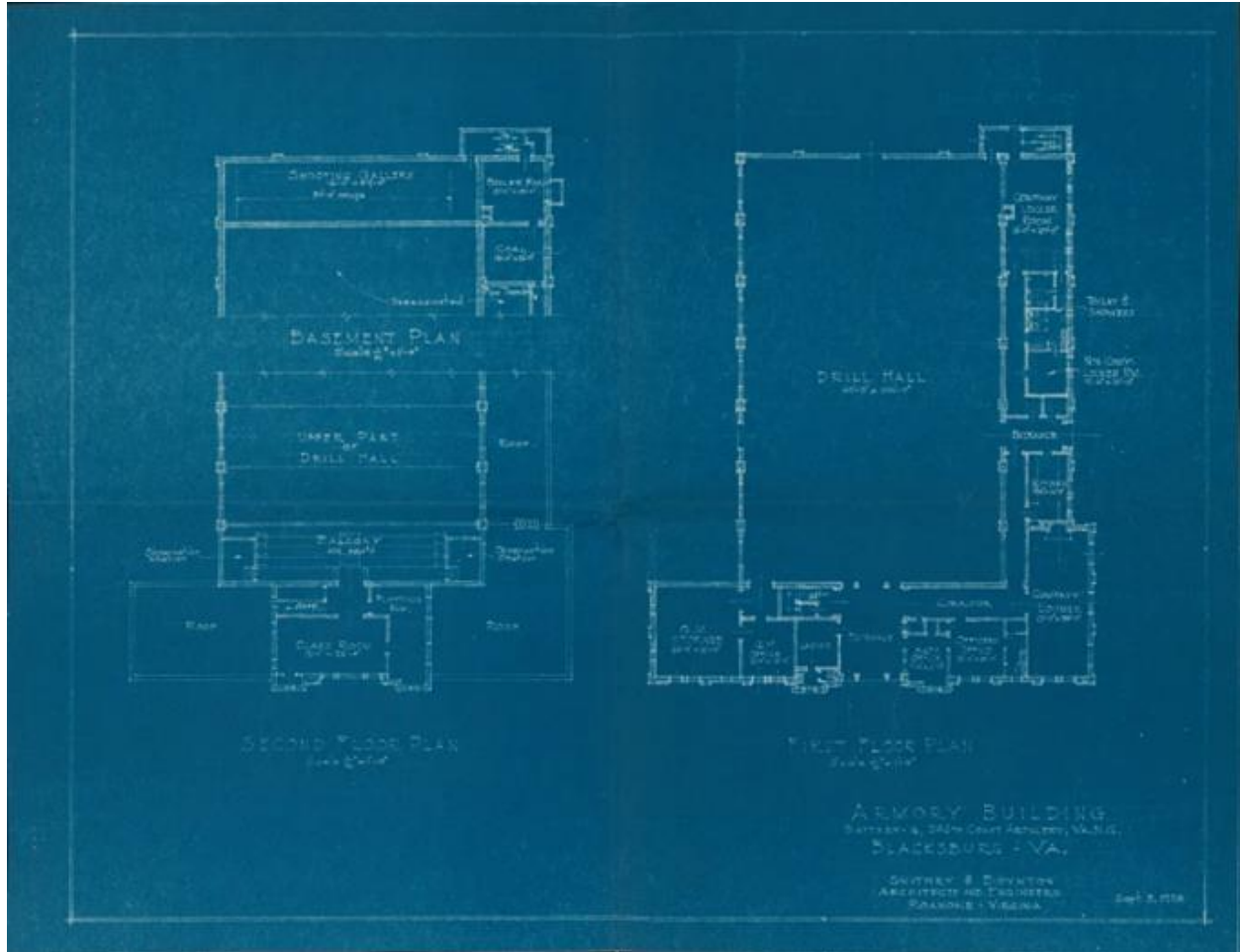


Figure 27. Armory Building in Blacksburg, designed by Smithey & Boynton.
Source: <https://scuablog.lib.vt.edu/2019/06/14/the-life-and-architecture-of-smithey-and-boynton/>

Their account of the history of the place did more than just fill in the Armory's – it sparked a deeper appreciation within me. The building is a memory woven into the fabric of Blacksburg and Virginia Tech, both past and present. It is a reminder that history is not confined to dates and old photographs. History lives and breathes within the places we walk past daily, urging us to appreciate the spaces we inhabit and the activities we engage in.

Object Biography

Buildings such as the Armory can be viewed as a distinct identity. We can almost personify them by focusing on their direct impact on people and their experiences. This approach transforms our understanding of the building from a static object to a dynamic, evolving spatial entity.

My discussions with Dr. Knoblauch, who has a background in archaeology, raised the idea of "object biography." Initially hesitant about personifying the building with individual experiences, she encouraged me to use this archaeological framework to view the Armory as an object with its own unique history and narrative. This means focusing on the building's material history and its evolving history, rather than retelling individual stories. Everything around us is made up of smaller parts. Even seemingly whole objects reveal themselves to be composites of individual elements. A building is an object too, with distinct parts serving distinct functions. These functions collectively shape the overall purpose and value of the space. In archaeology, object biography studies the history and significance of artifacts. Archaeologists examine every aspect of an object, big or small, to understand its distinct features and functions. Chiara Zuanni, Associate Professor in Digital Humanities in University of Graz, puts it well, "the concept of object biography was famously first proposed by Kopytoff in 1986, referring to the ways in which we can narrate the life-histories of objects, through their production, exchanges, and consumption, and the meanings they assume in these contexts"³⁰ A building's impact doesn't come from its wholeness, but from how individual parts affect different people. When building an environment, we should consider diverse potential users and their needs.

The Armory is no exception. As a built environment, its various parts have served different purposes and held various meanings for people over time. One poignant example was when a

black fabric installation adorned the building's exterior after the tragic 2007 Virginia Tech campus shooting. The space became a place of communal solace and empathy. Some of these impacts have faded from view, existing only as faded memories. Through my AR mural, I am visualizing these memories in a creative way, creating an environment that encourages discussion and social engagement.

Artistic Process

Experimenting with the Geospatial API

To test the Google Geospatial API's capabilities, I turn to Blender to create 3D models. I modeled round blobs to represent the historical information I have gathered about the Armory. These blobs were then exported as FBX files and imported into Unity.

Unity Setup

I imported the necessary AR packages: ARCore XR Plugin, ARCore Extensions, and Cesium Georeference for Unity. An AR session origin is created to control the AR camera, and the AR Geospatial Creator Origin maps the position of objects using real-world coordinates obtained from Google cloud. Cesium is used for this coordinate-based mapping and to display the 3D tiles of Google Street View in the Unity 3D scene. A Google Cloud API key is required for it to work.

Testing and Refinement

I used the 3D blobs to assess anchoring stability and occlusion in the AR experience. For a convincing illusion, anchored objects must remain in place and be realistically obscured by physical objects in the environment. This occlusion effect is powered by Google's ARCore Depth API for blending of physical and digital.

Anchoring Artwork

To anchor the blobs to the real world, using the correct coordinates, I added both the Geospatial Creator Anchor component and the AR Streetscape Geometry Manager components to the blobs GameObject in Unity.



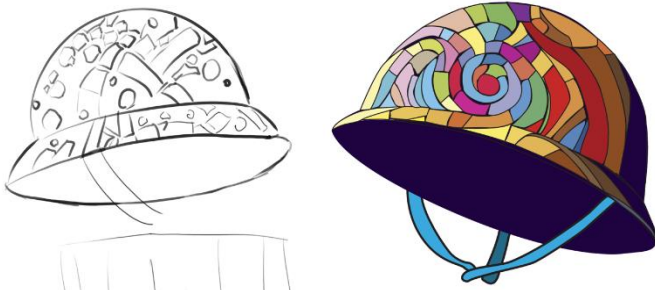
Figure 29. Test of the accuracy of the ball anchor in relation to the longitude and latitude of the Armory



Figure 28. Test of the accuracy of the occlusion using the 3D blob

2D Illustrations

The digital mural began with sketches using Krita, an open-source drawing and digital painting software. These sketches are then refined in Adobe Illustrator, where I add vector shapes and



create additional illustrations. Next, I used Photoshop to further illustrate and edit the images into segments, preparing them for rigging and animation in Unity. Unity's 2D

Sprite package was used to convert the imported image files into 2D Sprites. Components are adjustable properties that can be added to gameObjects, and gameObjects are any media file that



can be added to the scene or Viewport of the game engine. I used the Sprite Editor is used to create rigging systems and set weights of the Sprite Mesh, while the Animation Editor enabled me to create the desired motions for

my illustrations.

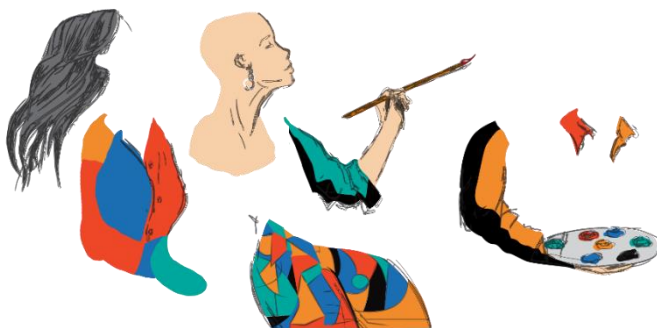
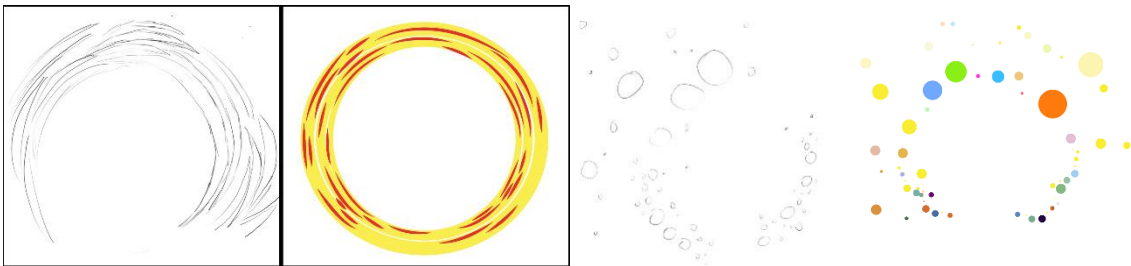


Figure 30. Snapshot of rigging individual sprites in Unity

Artistic Choices

My artwork uses visual elements to convey historical moments and the evolving spirit of the Armory. The illustration of the painter is a representation of the building's current identity as a space for artistic creation and exhibition. Their vibrant, multicolored attire symbolizes the diverse community of artists who work within the Armory today.

The painter's brush touches a dull gray military helmet, a callback to the Armory's origins as a place for military drills and storage. This touch represents the connectivity of memory, linking events across time in a creative interpretation of how the space is remembered. As the brush



meets the helmet, it animates and sparkles in colors, confetti sparks fly, colorful leaves swirl, and a portal-like shape bursts into life, scattering leaves and confetti around the Armory space. This symbolizes the vitality of the Armory space and offers a moment for the viewer to contemplate its significance. The leaves and confetti designs are animated in a way to utilize the space, giving a more sense of immersion.



While keeping to the Kandinsky's inspired style, I drew doodles which were additional touches that helped me stay in the design flow whenever I struggled to make a representational art. I used them as a function of beauty and segmentation of the space just as buildings or rooms within buildings are segmentation of spaces which become places for different function and activities. Another section of my artwork displays silhouettes: audiences watching a performer, and military figures holding weapons. This scene juxtaposes the diverse performances that have unfolded within the Armory over time. A dancer stands over a round shape, further emphasizing this theme. Behind this, abstracted paintings of onlookers symbolize the individuals, past and present, who have experienced the Armory. Finally, a boy sits studying beneath a basketball net, a representational image of the playful space the Armory once provided to students based on stories told to me by Ray Kass in an interview. Though inspired by the Armory's present and past function as a place, my art aims for an open interpretation, inviting the audience to participate in this creative exploration of the built environment's hidden narratives.





Figure 31. Doodles and representational abstract illustrations

Audience Participation

For the art showcase section of this project on May 2, 2022, I considered how the audience would engage with the AR mural using a tablet and how the rest of the audience not holding the tablet can also participate before and after the experience. I wanted everyone who steps into the Armory's space to begin engaging with the hidden narratives through my art even before holding

the AR device. The audience participatory section of this project led to the making of physical art and design choices that fostered social engagement amongst the audience and physical engagement with the art and was achieved by making maximal use of the space around the Armory building.

A side of the walls of the Armory building faces the present Media and Media Annex buildings, which were then elementary and high school buildings in Blacksburg. This section has three concrete chairs and tables, trees and a small grass patch that makes the space look and feel like a little section of a park, welcoming visitors to sit and relax. I capitalized on this, and had my audience spread and sit around this space by placing on these concrete tables, pencil drawings of the AR murals, empty drawing papers, pastel chalk, and a smaller sheet of paper containing instructions that guides the audience on what to do. With these, and with help from my exhibition attendants, the audience naturally went to the tables, sat on the seats, and drew using



Figure 32. Collaborative artwork made by the audience.

the pastel chalks while following the instructions. This led to little communal sections that gave the audience a glimpse of the AR art they would engage with, and became a place for social engagement as they chatted and collaboratively made art.



The instructions on the paper were quite simple and written in a poetic rhythmic fashion. The guideline idea was inspired by Sol Lewitt, an artist known for his remarkable minimalistic and conceptual art pieces. As described in the video published on YouTube by Icarus Films, LeWitt's can be seen as "simple ideas, communicated simply-often with a set of instructions sent by fax-lead to overwhelming visual and intellectual complexity."³¹ He believed ideas were instrumental in art making and would give instructions that people could follow to visualize the mental idea. An example is Sol LeWitt wall drawing made at Dia Beacon, museum for the Dia Art Foundation.³² I took the similar approach as a medium for the audience to visualize the ways I have imagined a creative visualization of the hidden narratives

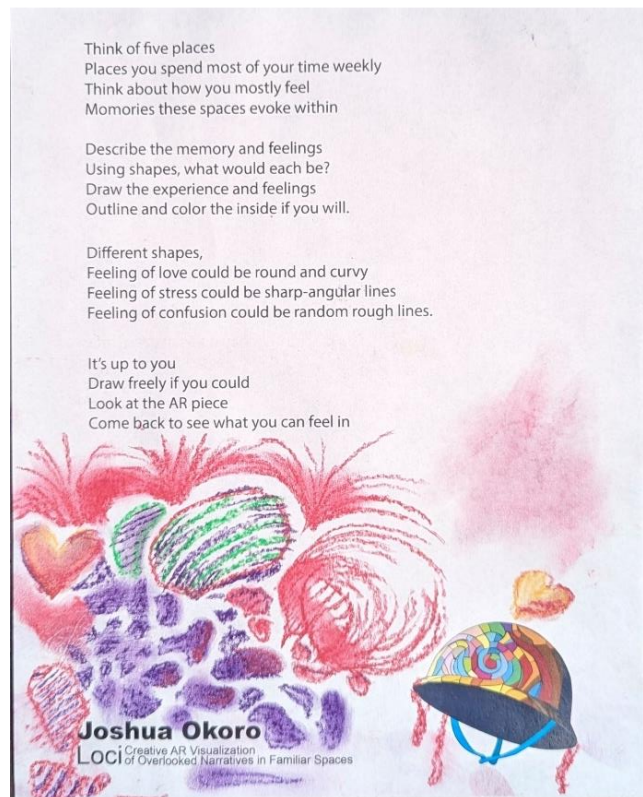


Figure 33. Instructions written for the audience.

in the space they occupy, but also making room for their own artistic expression on the empty

paper. One interesting outcome of is the pastel drawing made on the instruction sheet, which I find exceptionally beautiful (figure 33).



Figure 34. Capture of the audience experiencing the AR Murals at the Armory



Figure 35. Capture of the audience experiencing the AR Murals at the Armory

Theme

The core themes of my work are memory, connection, and transformation. Through augmented reality and the evocative power of nostalgia, my art aims to challenge preconceived notions people might have about the Armory building. The concept of social memory – the psychological processes of acquiring, storing, retaining, and later retrieving information – is central to my work. Memory often manifests as a mental picture. My artwork can be seen as a visual representation of the Armory's past – a collection of activities that have unfolded within its space throughout time, highlighting both their connections and their unique differences.

Technical Challenges

Internet Connection

One of the key issues I encountered with the AR Geospatial Creator Anchor is its dependency on good internet connection to anchor the murals to the latitude and longitude coordinates of the Armory building. Experiencing the art outside on a sidewalk around the building resulted in poor Wi-Fi connection. Though this can easily be fixed by using a network carrier internet service, it would be better if the art experience does not depend on external factors. As a result, the murals jump from one point in space to another if the internet speed fluctuates rapidly.

The work around for this challenge was using C# programming language to code in a control system that repositions the artwork back in the desired position using three unobstructive user interface buttons. One button moves the murals closer and farther away from the viewer in all directions and the other buttons pair move the murals higher and lower.

Device Limitation

AR as an artistic medium has its drawbacks. We are accustomed to experiencing the real world through the most advanced camera there is – our eyes. The form factor of smartphones and tablets, with their small screens, creates a "tiny window" effect that can sometimes be a frustrating viewing experience for users. On the positive side from my tests with users, they got more immersed in the experience as they focused on the tablet size window and moved around the building. This brought about safety concerns, there was minor risk of users hitting objects as they walked because they were very engaged with the artwork. To ensure safety, exhibition attendants were on-site during the art show to help and monitor the audience's movement.

Cross-Platform Development

While Unity's AR Foundation aims to support cross-platform development, allowing you to use packages like ARCore or ARKit for both Android and Apple devices, this is not a guarantee. The Loci application works better for Android devices and some features do not work on IOS devices. Advanced features, like ARCore Depth API, often do not function on all platforms. Unity is just one of many game engines used for creating AR experiences. However, porting a project from one game engine to another is often difficult. Most projects need to be redeveloped if an artist or developer wishes to switch platforms.

Future

For the near future, the Armory building is still going to be the home of SOVA, but a lot can happen even within a year, I plan to keep the artwork updated as the place evolves while adding more direct educational contents. During the showcase of this work, I noticed the AR mural made some participants more curious about the armory building. Most people in attendance already knew the story of the building. The few who did not know asked me what its history was, the AR animated murals made them fascinated, which was the aim of the project. This made me consider adding more educational elements as I update the creative AR murals. This artwork is creative compared to traditionally educational materials yet designed around the history of the past events in that place. In the next iteration, after stimulating the audience curiosity, they would be able to interact with the AR mural to display information of the place and acquire more factual context.

The next phase of this artwork is giving everyone the ability to experience spatial artworks from their own device through sharable QR codes. I plan to ship the app to major platforms, Google Play Store, Apple App Store, and the web. Future iterations would be a global platform for artists to situate their work at any locus, creating a physical encyclopedia of unique places. An interesting aspect of this research is that it led me to discover more fascinating historical structures in my home country, Nigeria. One example is The Majestic Wall of Ancient Kano situated in Kano state, Nigeria. According to The Citizen Reports, a Nigerian online news platform, “the foundation of this remarkable architectural feat was laid by Sarki Gijimasu (r. 1095–1134), the third king of the Kingdom of Kano, completed in the mid-14th century and expanded in the 16th century.”³³ Another example is the Gobarau Minaret, a 50-foot structure in

Katsina state Nigeria built in the 15th century. Loci would serve as a rich resource of history for anyone to explore and a platform for artists around the world to display hidden stories just as I plan to do with places like The Majestic Wall of Ancient Kano and the Gobarau Minaret of Katsina. Looking forward, just like Wikipedia provides a vast textual catalog of human knowledge, Loci would provide a vast spatial catalogue of hidden narratives of places around the world.

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