Final White Paper

Project Summary

The Immersive Global Middle Ages Institute (IGMA) was a 28-month initiative funded by the National Endowment for the Humanities (NEH). Running from January 2022 to December 2023, the Institute aimed to integrate immersive technologies into humanities research, teaching, and public outreach, focusing on the Global Middle Ages (500–1500 C.E.). The project engaged scholars, educators, and students in developing digital reconstructions of medieval sites and integrating interdisciplinary methods. Outcomes included open-access pedagogical tools, digital models, and wide-reaching dissemination.

Origins and Goals

The IGMA initiative was founded to address the challenges of studying the Global Middle Ages through interdisciplinary methods and innovative technology. The project's goals included fostering an inclusive scholarly community, training participants in digital tools such as SketchUp Pro, and creating immersive digital reconstructions of significant medieval sites. The project emphasized storytelling, cultural preservation, and inclusivity, aiming to enhance the understanding of medieval globalism and its modern implications.

Institute Overview

Activities

The Institute conducted fourteen virtual workshops focusing on interdisciplinary methodologies, ethical considerations, and digital storytelling. Participants received training in digital modeling and immersive tools through interactive sessions. Two in-person workshops at Vanderbilt University and UCCS provided opportunities for collaborative project development and direct mentoring.

Assignments

Assignments included the creation of digital reconstructions, such as the Islamic House of Wisdom and a synagogue in Plasencia, Spain. Participants developed research questions and visualizations using tools like SketchUp and Gephi, explored ethical considerations in digital humanities, and engaged in collaborative storytelling projects. These tasks emphasized skill development in digital modeling, historical analysis, and inclusive narrative construction.

Tools

Participants utilized tools including SketchUp Pro for 3D modeling, Gephi for data visualization, and Google Drive for collaborative work. These tools supported a wide range of digital humanities projects and allowed participants to engage deeply with immersive technologies.

Platforms

Zoom was used for synchronous virtual workshops and discussions and Canvas hosted readings, assignments, and tutorials.

Team

Organizers

The project was led by Dr. Roger L. Martinez-Davila (UCCS) and Dr. Lynn Ramey (Vanderbilt University), who coordinated the development and implementation of the Institute's goals.

Staff

Administrative and technical staff supported the logistics of the workshops, ensuring smooth delivery of content and tools.

Gavin Rogers, IGMA Graduate Research Assistant, University of Colorado-Colorado Springs

Bryant White, IGMA Graduate Research Assistant, Vanderbilt University
Greg Williams, IGMA Technical Adviser, University of Colorado-Colorado Springs

Expert speakers

Speakers included interdisciplinary scholars specializing in medieval studies, digital humanities, and cultural preservation.

Geraldine Heng (University of Texas at Austin) – Heng is the founder and director of the Global Middle Ages Project and Professor of English. Her work envisioning the Middle Ages as a global field of study is recognized by the Medieval Academy of America and international institutions. She oriented participants early in the Institute.

Lisa Fagin Davis (Medieval Academy of America) – Davis is a visionary who calls for greater diversity and champions digital projects. Fagin discussed medieval studies at the intersection of diversity and technology.

David Charles Fredrick (University of Arkansas) – Fredrick is an Associate Professor in Classical Studies at the University of Arkansas, where he also directs the Tesseract Center for Game Design. His research interests include space and artwork in Pompeii, intersectionality in video games, and video games as platforms for teaching culture and language. Tesseract's serious games using WebGL and VR include a 14th-century Native (Caddo) World Renewal ceremony. Fredrick led a session on working with students and best practices for humanities laboratories.

Jaime Molina Vidal (Universidad de Alicante, Spain) – Molina Vidal is a Professor of Ancient History and director of the digital patrimony and archeology program at the university. He prompted participants to contemplate how historical memory (and the biases embedded within it) frame what we create in immersive worlds.

Sean Perrone (St. Anselm College, New Hampshire) – Perrone is a Professor of History and Government who collaborates with Martinez-Davila on storytelling in virtual environments. He guided participants in a discussion of how to implement a digital story using a historical setting, objects, and avatars.

Victor R. Schinazi (Bond University, Australia) – Schinazi is an Assistant Professor of Psychology. His research combines real-world and laboratory experiments to investigate various topics in spatial cognition, environmental health, and the development of immersive virtual environments that can mimic real-world situations. He explored with participants how real-world experiences can be mimicked in immersive environments.

Dorothy Kim (Brandeis University) – Kim is Assistant Professor of English who instructs students on text-based digital humanities projects. Much of her work has been at the intersection of identity, particularly racial and gender, and she led the group in an exploration of issues of access and diversity that emerge when working with digital and immersive projects.

Tracy Fullerton (University of Southern California) – Fullerton is a Professor of Interactive Media and Games and the principal architect of the award-winning NEH-funded immersive experience, Walden, A Game. She counseled participants in the choreography of users' exploration of immersive environments.

Madeleine Casad (Vanderbilt University) – Casad was instrumental in developing Vanderbilt University's Center for Digital Humanities, where she served as Executive Director. A former digital humanities librarian and Ph.D. in Comparative Literature, Casad has expertise in all aspects of digital humanities projects, from conception to grantmaking to data management. She conducted a session on project management.

David Neville (Grinnell College) – Neville is a medievalist and Director of Grinnell's Immersive Technologies Laboratory. He has extensive experience and publications related to creating student learning experiences in XR and game-based learning.

Lisa Snyder (University of California at Los Angeles) – Snyder is the Director of the Research Technology Group at the Institute for Digital Research and Education. She developed a reconstruction model of the medieval Temple Mount in Jerusalem that illustrates the structures on site and that was installed in 2001 in the Davidson Center in the Jerusalem Archaeological Park. She advised participants on the best practices for digital documentation of historical urban environments.

Catherine Holmes (Oxford University, UK) – Holmes is a Professor of Medieval History and one of the pioneers of the scholarship of the Global Middle Ages in the international arena. She guided participants in a discussion of the developments in the field, as well as prompt participants about their roles in shaping its future.

Participants and Individual Projects

The Institute engaged a diverse group of scholars whose projects exemplified the innovative use of immersive technologies. Over the course of the institute, the participants developed their individual projects, which we describe from their own summaries.

Dr. Hadeer Aboelnagah, a professor of English literature and translation at Prince Sultan University, focuses on the historical intersections between Islamic civilization and the West, emphasizing intercultural communication through literature and interdisciplinary studies. Her current project centers on the digital recreation of the House of Wisdom, a landmark institution established by Al-Khalifa Al-Ma'mun during Islam's Golden Age. This virtual reality project seeks to reimagine the House of Wisdom as a hub of human excellence, intercultural exchange, and scholarly achievement. The institution, renowned for fostering groundbreaking discoveries and advancing knowledge, highlights the contributions of figures such as Ibn Al-Nafis, Ibn Al-Haytham, and Ibn Sina. Dr. Aboelnagah aims to bring this rich intellectual legacy to life using Digital Humanities tools, offering students and audiences an immersive experience that underscores the House of Wisdom's unparalleled impact on the development of global civilization.

Dr. Blair Apgar, an assistant professor in the History and Geography department at Elon University, explores 11th to 13th-century architecture on the Italian Peninsula, particularly during the Investiture Controversy and the First Crusade, as well as medievalism in modern popular culture. Her current project focuses on the thirteenth-century Santo Stefano complex in Bologna. Using virtual reality to create an immersive model of the site, the project examines how pilgrims engaged their senses and imagination to transform the architecture into spiritual counterparts in Jerusalem. This work highlights VR's ability to recreate historical environments and probe the metaphysical connections imagined by medieval pilgrims. By emphasizing sensory and imaginative experiences, Dr. Apgar's research uncovers deeper understandings of medieval audiences and the power of imagined pilgrimages. The project advances immersive technology as a tool for exploring the transformative potential of human imagination.

Figure 1 - Blair Apgar's SketchUp model of Santo Stefano.

Dr. M. Christina Bruno and **Ms. Katherina Fostano** of Fordham University co-direct the innovative project *Medieval New York,* which reimagines the global influence of the Middle Ages within the modern urban landscape of New York City. Their project views New York as a historical palimpsest, where remnants of medieval architecture, artifacts, and cultural connections are woven into the city's fabric. At the core of their work is the development of a mobile application that employs immersive technology and digital storytelling to guide users through curated itineraries. The app aims to reveal hidden medieval connections across the city, allowing users to visualize and engage with history interactively. By transforming modern locations into touchpoints of the medieval past, the project deepens public understanding of this often-misunderstood era. Future plans include integrating crowdsourcing features, enabling users to identify "medieval" elements in New York. The project also envisions partnerships with K-12 educators to teach the global Middle Ages innovatively.

Dr. Jonathan Correa Reyes, an Assistant Professor at Clemson University, is revitalizing the study of Geoffrey Chaucer's *The House of Fame* through the innovative use of virtual reality. His project focuses on recreating the poem's intricate architectural spaces, many of which reflect the medieval art of memory tradition. The poem follows Geffrey, Chaucer's protagonist, as he navigates visually and sonically rich environments, including the Temple of Venus, with depictions of the *Aeneid*, and Fame's Palace, a chaotic space filled with the sounds of countless voices and languages. By developing 3D immersive models, Dr. Correa Reyes offers students and the general public the opportunity to experience these sensory environments firsthand. This project not only enhances the study of Chaucer's work but also inspires new pedagogical approaches to medieval literature. Through virtual reality, Dr. Correa Reyes bridges centuries, bringing *The House of Fame* to life for modern audiences.

Ms. Claire Dillon, a PhD candidate in art history at Columbia University and fellow at the Metropolitan Museum of Art, specializes in the arts of the lands of Islam with a focus on the medieval Mediterranean and its historiography. Her dissertation examines the evolving attributions of silk textiles and how these changes reflect modern encounters with medieval multiculturalism and exchange. For the institute, Dillon's project shifts focus to reconstructing neo-medieval colonial projects undertaken by Italian institutions in North and East Africa. Examples include the Sicilian-inspired cathedral of Mogadishu, now destroyed, and the cathedral of Tripoli, which has been transformed into a mosque. Through archival research in Rome, Dillon works to virtually reconstruct these buildings, offering insights into how medievalism was appropriated for colonial purposes. Collaborating with initiatives like Somali Architecture, Dillon's models highlight the historiographical misuse of the Middle Ages while contributing to sustainable development efforts and broader discussions on the constructed nature of historical narratives.

Dr. Nahir Ivette Otaño Gracia, an assistant professor at the University of New Mexico at Albuquerque, examines the dissemination, translations, and literary innovations of medieval Arthurian texts across multiple languages, including Old Norse-Icelandic, Latin, Middle Welsh, Castilian, Catalan, and Old French. Her comparative research challenges the traditional narrative of Arthurian stories traveling linearly from Britain to France and outward, instead revealing a more dynamic web-like spread across Europe. For this project, Dr. Otaño Gracia developed a visual model tracing the dissemination of Arthurian names in Northern Spain from 1136 to 1300. Historical records, such as contracts, show individuals named after Arthurian characters living along the roads leading to the Cathedral of Compostela. These findings highlight the simultaneous circulation of Arthurian narratives across Europe alongside the movement of people and ideas. Her work rethinks traditional models of artistic and literary circulation, promoting a cyclical and interconnected approach to understanding the global exchange of medieval knowledge and culture.

Dr. Matthew Herbst, director of the Making of the Modern World at University of California at San Diego, proposed a project within the institute but was unable to bring it to fruition. Despite his extensive experience leading experiential programs abroad and facilitating innovative educational initiatives—ranging from community-based undergraduate projects to environmental humanities seminars—this specific endeavor did not progress as planned. The project's challenges may have stemmed from logistical complexities, competing professional commitments, or the ambitious scope of its conceptualization.

Dr. Edward Holt, the Benjamin A. Quarles Endowed Professor in History at Grambling State University, focuses on the medieval Mediterranean, particularly the construction and negotiation of leadership. For the institute, Dr. Holt's project centers on the digital reconstruction of medieval Córdoba, with a focus on the Fernandine Churches. These twelve churches, established after the 1236 Christian recovery of Córdoba under Fernando III of Castile, serve as markers of royal authority and cultural transformation. Using geographically accurate maps and architectural plans, the project creates an immersive digital environment that highlights the hybrid nature of Córdoba's history. The Fernandine Churches reflect the city's interreligious reality, blending influences from Visigothic and Islamic traditions while representing diverse religious orders. Dr. Holt's work explores the constructed memory of Fernando III and its relationship to the physical landscape, revealing local leadership dynamics and the site's role as a place of cultural and historical encounter in the medieval Mediterranean.

Dr. Sierra Lomuto, an assistant professor of English at Rowan University, specializes in medieval literature viewed through a global lens, with a focus on travel narratives and the early development of race in literary discourses. For the institute, her project, titled "Sukhothai to San Francisco: An Immersive Journey of Medieval and Modern Interaction," aimed to employ virtual reality technology to explore the political and cultural implications of decapitated Buddha heads in Western museums and interior design. The project seeks to create a guided VR exhibit that takes users on an interactive journey. Participants begin by stepping into a medieval manuscript of the Letter of Prester John, engaging in a close reading of the text. They then explore a headless Buddha statue in Sukhothai, Thailand, and a displaced Buddha head from Sukhothai on display at the Asian Art Museum in San Francisco. Through this immersive experience, Dr. Lomuto uses medieval literature as a tool to investigate histories of colonialism and the ongoing fetishization of Asian cultures in the West. By connecting the Latin Middle Ages to Thailand's historical Sukhothai Kingdom, the project highlights the synchronous yet disparate histories of these regions, encouraging reflection on how colonial legacies have shaped the modern appropriation of non-Western artifacts.

Dr. Courtney Luckhardt, an associate professor of history at the University of Southern Mississippi, specializes in medieval history with a focus on power, holiness, identity, migration, and mobility during the transformation of the Roman world in the Global Middle Ages. Her current project examines early medieval migration and cultural interaction in the region spanning southern France (Septimania) and northern Spain (Catalonia) during the ninth and tenth centuries—a period marked by the reshaping of the former Roman province into the Spanish March between the Frankish Empire and the Umayyad Andalusi Caliphate. As part of the institute, Dr. Luckhardt developed the project "Traveling the Via Domitia in Virtual Reality: Movement and Migration in Mediterranean France, 700–1100." The Via Domitia, a Roman road built in the second century BCE, connected the Italian and Iberian Peninsulas through southern France and remained vital for trade, pilgrimage, and migration in the early Middle Ages. Using GIS mapping, digital storytelling, and virtual reality reconstructions, this project recreates central places along the Via Domitia, highlighting the diverse communities and travelers who shaped the region. Dr. Luckhardt investigates how immersive technologies and Internet-accessible historical data can transform perceptions of the distant past, offering audiences a dynamic and interactive understanding of medieval mobility and migration.

Maureen McGuire, a Ph.D. candidate at the University of California, Santa Cruz, focuses on the cultural matronage of Anikia Juliana, a prominent 6th-century noblewoman in Constantinople. Juliana funded the construction of the Church of St. Polyeuktos, a magnificent structure dedicated to a soldier-saint. Although now in ruins, the church played a critical role in the architectural and cultural landscape of early Byzantium. For the institute, McGuire is creating a digital simulation of the church using excavation records, historical descriptions, and informed hypothesizing. Her project digitally reconstructs the church, including its likely domed sanctuary, to better understand its architectural significance and its influence on both Byzantine and later Ottoman visual culture. The simulation forms a key component of McGuire's dissertation, providing scholars and audiences with an immersive tool to explore the church's grandeur and its broader historical resonance.

Dr. Curtis Dean Smith, Professor of Chinese at California State University, Sacramento, specializes in Chinese intellectual history of the first millennium B.C. and Chinese literature of the first millennium A.D. For the institute, Dr. Smith's project focuses on creating an immersive virtual recreation of the residence and environment of the renowned fourth- to fifth-century Chinese poet Tao Yuanming, also known as Tao Qian. The project is grounded in Tao Yuanming's most celebrated work, "Drinking Wine, Number Five," a poem often considered the pinnacle of Chinese literary history. Written in classical Chinese, the poem's non-inflected and non-phonetic language conveys an immediacy of perception—akin to a linguistic virtual reality—that is difficult to replicate in translation. Through the virtual recreation, Dr. Smith seeks to provide students and audiences an immersive experience of Tao's world, enabling them to engage with the poem's immediacy and the poet's contemplative environment.

Dr. Elizabeth West, Professor of English at Georgia State University and Academic Director for the university's Center for Studies on Africa and Its Diaspora, specializes in African American and Africana literatures with a focus on gender and spirituality across the 18th and 19th centuries. For the institute, Dr. West is expanding her research to explore pre-modern West Africa through a project titled "A Virtual Geo-Historiographic Simulation of a 15th-Century Timnee Community." The project focuses on the Timnee people of Sierra Leone, encouraging viewers to reimagine and explore the histories of West African populations that preceded and overlapped with the Middle Passage. By situating the Timnee within broader Africana migration and movement patterns, Dr. West highlights a rich and underrepresented historical narrative of the Middle Ages. In collaboration with Basit Amuda, a GSU graduate student in Geosciences, Dr. West is creating a SketchUp simulation of a Timnee community located along the estuary where the Sierra Leone River meets the Atlantic Ocean. The project imagines everyday life, emphasizing material artifacts and cultural customs that reflect the period's social and historical context. This digital reconstruction blends literary scholarship with geo-historiography, offering an interdisciplinary approach to understanding pre-colonial West African histories.
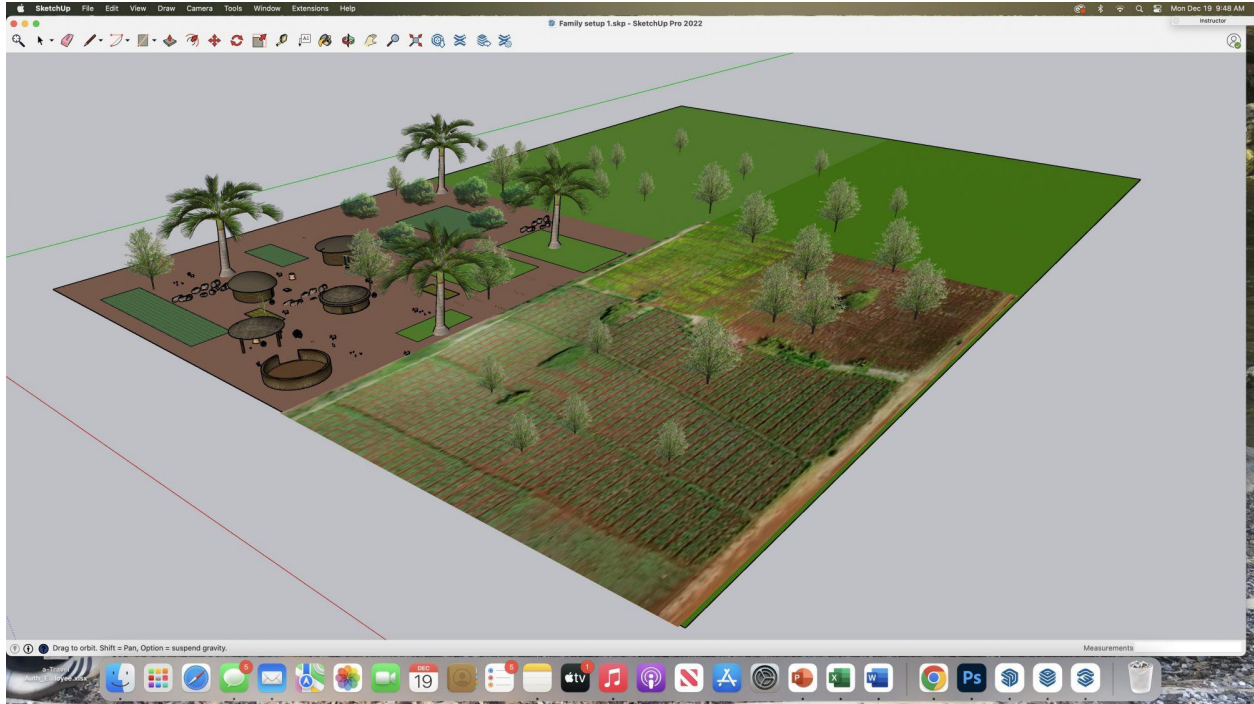
Figure 2 - Elizabeth West's simulation of a 15th-century Timnee community.

Dr. Anne McClanan, Professor of Art History at Portland State University, proposed a project for the institute focused on developing digital resources for an upcoming exhibition on Chertsey Abbey and Crusading movements. This project intersected with her ongoing research for a book on the representation of griffins, published by Reaktion Books UK in late 2022/early 2023. Despite Dr. McClanan's extensive expertise in medieval art history and her background in digital humanities, the project did not come to fruition. The challenges may have arisen from competing professional priorities, including the demands of her book publication and other scholarly commitments, alongside the complexities of developing exhibition resources. While the project remained unrealized, Dr. McClanan was a vibrant participant in the institute.

Project Outcomes and Evaluation

Participant Feedback

Participants praised the Institute's interdisciplinary approach and the depth of training provided. They valued the collaborative opportunities and the utility of digital tools in advancing their research. Many participants expressed a desire for additional time to deepen their engagement with the tools and methodologies introduced.

Outcomes and Evaluation: First Portion of the Institute

The institute demonstrated overwhelmingly positive outcomes, as reflected in the Summer 2022 evaluation survey. The combination of virtual workshops, access to specialized technology, and in-person collaboration created a robust environment for participants' learning, professional growth, and project advancement.

- *Virtual Workshops:* Participants rated the virtual workshops highly across multiple dimensions. The curriculum was seen as highly useful to participants' work, with a score of 97.5. The institute directors and staff were universally praised for their attentiveness, receiving a perfect score of 100. Similarly, participants acknowledged the quality and depth of expertise offered by the invited speakers, who scored an impressive 92.5. The focus on technology training, particularly with tools like SketchUp Pro, was deemed practical and valuable, achieving a score of 90. This highlights the success of the institute in providing participants with concrete digital tools for academic and research work. Moreover, participant discussions were noted as well-managed, engaging, and useful (95), indicating a productive and dynamic environment for idea-sharing.

- *Technology Access:* A major strength of the program was the provision of specialized laptops to participants. For many, this resource was essential, with six out of eight participants rating it as very or extremely important to their ability to participate effectively. Access to reliable and specialized technology enabled participants to engage fully with the workshops and apply new tools to their projects, demonstrating the institute's commitment to removing barriers to learning.

- *Individual Virtual Workshop Sessions:* Specific sessions were rated as particularly engaging and impactful. The "Global Middle Ages" session led by Geraldine Heng received a mean score of 90, reflecting its resonance with participants. The "Patrimony and Preservation" session by Jaime Molina Vidal also earned high praise with a score of 90, emphasizing the session's relevance to participants' work. Sessions like "Interdisciplinary Studies" and "Workflows and Labs" were also recognized for their engaging content and practical insights, demonstrating the diversity and breadth of the curriculum.

- *Summer In-Person Workshop:* The in-person workshop held at UCCS emerged as a cornerstone of the institute's success. Participants unanimously agreed that the curriculum was useful to their work, scoring a perfect 100. The attentiveness and support of the institute directors and staff also received unanimous praise (100). Specific sessions such as "Introduction and Overview" by Roger Martinez and Lynn Ramey and "Storyboarding with Twine" led by Lynn Ramey scored exceptionally well, with means of 97.5 and 95, respectively. This underscores the value of hands-on, interactive sessions that combined theory and practice.

Participants further noted that the collaborative environment was one of the institute's strongest assets. Opportunities to interact with peers, directors, and guest speakers were plentiful, scoring 97.5. Evening activities, including group dinners and outings to Garden of the Gods and Manitou

Springs, were lauded for fostering camaraderie and a sense of inclusion. These extracurricular events allowed participants to form meaningful relationships, strengthening both personal and professional bonds.

Additional participant comments underscored the institute's impact. Many participants highlighted significant professional growth, emphasizing how the workshops generated new ideas and strengthened their projects. The balance between work and extracurricular activities was praised, as it facilitated collaboration and deeper connections among participants. One participant described the in-person sessions as "absolutely spectacular," noting they made significant progress in conceptualizing their project.

Some constructive feedback suggested slight adjustments, such as creating more practical handouts in booklet form for ease of use. Others recommended including breakout discussions and sessions for participants to showcase their work-in-progress, further promoting collaboration and individualized learning.

The institute succeeded in providing an innovative, inclusive, and transformative experience. By integrating cutting-edge technology, academic enrichment, and community-building, it empowered participants to advance their projects and expand their knowledge. The positive outcomes reflect the institute's thoughtful planning, strong leadership, and its ability to foster a collaborative and intellectually stimulating environment.

Outcomes and Evaluation: Second Portion of the Institute

The institute continued to evolve and improve its curriculum and workshop structure based on feedback from the Summer 2022 participants, demonstrating responsiveness to participant needs and a commitment to fostering collaborative, hands-on learning environments. These adjustments were especially apparent in the subsequent virtual workshops and the Summer 2023 Workshop: Envisioning Immersive Global Medieval Communities.

Virtual Workshop Adjustments

Based on participant surveys from Summer 2022, three key modifications were made to enhance engagement, learning, and collaboration in the virtual workshops:

- *Streamlined Workshop Structure:* Feedback indicated a need for more practical engagement. To address this, we shortened and tightened virtual workshops, cutting lecture times in half. The remaining time was dedicated to hands-on demonstrations where participants could apply learned concepts directly. This structure balanced theoretical instruction with practical implementation, ensuring participants gained real-world skills while keeping the sessions dynamic.

- *Breakout Sessions for Collaboration:* Participants expressed a desire for collaborative opportunities. To meet this need, we introduced breakout sessions during virtual workshops. These small group settings enabled participants to collaborate, share their progress, and troubleshoot challenges with peers. The breakouts not only fostered stronger bonds among participants but also created a space for peer-to-peer learning,

allowing participants to assist one another with specific projects and tools.

- *Promoting Leadership and Collaborative Outcomes:* Recognizing the diverse expertise of participants, the institute encouraged leadership within the group. Several participants took on prominent roles, including developing a published edited volume of projects and leading collaborative grant-writing initiatives. This promoted collective ownership of outcomes, empowering participants to contribute to the broader scholarly community while advancing their own projects.

An Enhanced Summer 2023 Workshop

The Summer 2023 Workshop built upon these improvements, incorporating a robust schedule that prioritized hands-on work, practical applications, and participant-driven collaboration. Hosted in Nashville, TN, from July 12–15, 2023, the workshop combined expert instruction with structured work time to ensure tangible progress on participant projects.

Participants arrived in Nashville on July 12 and attended a welcome dinner at Hopsmith. This informal evening allowed participants to reconnect, build camaraderie, and set the stage for productive collaboration over the following days.

The second day began with a structured series of practical sessions at the Center for Digital Humanities at Vanderbilt University. Key highlights included:

- *Session 2: Enscape - Sound, Lighting, Avatars*. Led by Lynn Ramey and Roger Martinez, this session provided a hands-on deep dive into Enscape, a powerful tool for virtual environments. Participants explored advanced features, including sound integration, avatar creation, and lighting to enhance their immersive projects.

- *Session 3: Loading Projects into Oculus*. Participants learned to upload their projects into Oculus VR environments, allowing them to engage with their immersive worlds in real time.

- *Session 4: Participant Collaboration Time*. In a significant improvement over 2022, the curriculum carved out dedicated time for collaborative work. Participants were encouraged to share progress, refine ideas, and seek feedback. This hands-on, peer-driven session created a fertile environment for problem-solving and creative innovation.

The day concluded with an evening at Acme Feed & Seed in downtown Nashville, offering participants additional time for informal collaboration and community building.

Day 3 emphasized project organization and presentation, providing participants with practical tools to manage their work effectively and communicate their ideas to broader audiences. Key sessions included:

- *Session 6: Breakout Session on Project Management Tools*. Participants rotated through stations to explore tools such as Slack, Trello, GitHub, Zotero, and Teams, with a focus

on organizing tasks, sharing resources, and streamlining project workflows.

- *Session 7: Presenting Your Project to an Audience*. In this hands-on session, participants created short videos and elevator pitches for their projects. These were posted to our website https://grants.uccs.edu/igma/institute-projects/ as project summaries. Using tools like PromptSmart for teleprompters and iPhone filming techniques, Roger Martinez provided a live demonstration, equipping participants with skills to effectively present their work to both academic and general audiences.

- *Session 9: Grant Writing and Funding*. Addressing feedback for more professional development, this session offered practical guidance on securing funding through grant writing. Participants collaborated on strategies for developing proposals, highlighting the institute's focus on producing actionable outcomes.

The evening included a group dinner at Sitar Indian Cuisine, further enhancing participant relationships in a relaxed setting.

The final day provided a forward-looking focus. Participants attended an optional session on organizing an edited volume, reinforcing the leadership and collaborative outcomes initiated after Summer 2022. Discussions also laid the groundwork for continuing projects into Fall 2023 virtual workshops, ensuring ongoing support for participants.

The adjustments made after Summer 2022 feedback—streamlined workshops, breakout sessions, and participant leadership—were seamlessly integrated into the Summer 2023 workshop. By prioritizing hands-on engagement, practical tools, and participant-driven collaboration, the institute empowered scholars to advance their immersive projects effectively. Participants gained new technical skills, built professional relationships, and contributed to ongoing scholarly initiatives such as grant proposals and publications.

Overall, the institute successfully balanced theoretical instruction with real-world application, fostering a transformative and inclusive environment that enabled participants to make measurable progress on their research and projects. The institute's adaptability and participant-centered approach continue to position it as a leader in innovative, interdisciplinary scholarship.

The Eight-Fold Way: A New Process for Developing Immersive Worlds

Through the development and execution of the institute, we have created a groundbreaking methodological framework for producing immersive, geographically precise, and historically grounded virtual worlds. This process, which we call the Eight-Fold Way, provides a systematic approach to integrating digital humanities tools, qualitative and quantitative data, and generative artificial intelligence to bring the global Middle Ages to life. We are now publishing this work as part of the Global Middle Ages "Element" Series with *Cambridge University Press*.

A Structured and Iterative Method

- The Eight-Fold Way comprises eight interdependent stages that guide scholars through the creation of immersive historical environments:
- Framing Virtual World Questions and Stories: Scholars identify underrepresented narratives and themes, grounding their projects in critical research questions.
- Manifesting Digital Narratives: Temporal and event-driven storytelling is visualized through digital timelines and narrative planes.
- Triangulating Space and Place: A precise spatial framework is developed using medieval maps, literary sources, and modern tools like Google Earth and GIS mapping.
- Inventorying and Prioritizing Elements: Core components such as architecture, artifacts, and communities are cataloged and prioritized for their relevance and impact.
- Modeling Structures, Objects, and Environments: 3D modeling tools like SketchUp Pro and Blender, combined with AI platforms (e.g., DALL-E, RunwayAI), recreate historical spaces and objects.
- Visual and Interdisciplinary Analysis: Models undergo iterative refinement informed by interdisciplinary analysis across history, art, literature, and environmental studies.
- Telling Stories Through Immersive Scenes: Models are assembled into interactive environments with attention to spatial relationships, soundscapes, and lighting to bring narratives to life.
- Dissemination for Public and Scholarly Audiences: The final outputs are shared through VR platforms, interactive exhibits, videos, and scholarly publications, engaging a global audience.

The Eight-Fold Way equips students, scholars, and creators with a practical, interdisciplinary toolkit for virtual world development. By fusing historical scholarship with advanced digital technologies, it enables an immersive exploration of medieval landscapes, communities, and narratives.

Overall Takeaways

The IGMA Institute demonstrated the transformative potential of integrating immersive technologies into medieval studies. Key lessons included the need for shorter, focused sessions to enhance participant engagement and the importance of robust technical support to ensure accessibility to digital tools.

Appendix A: Institute Curriculum

The intensive series of fourteen monthly virtual workshops (January 2022–December 2023) and two four-day in-person workshops at the University of Colorado–Colorado Springs (summer 2022) and Vanderbilt University (summer 2023) ensured that the project met its primary goal of

guiding humanists through a comprehensive immersive reality curriculum, culminating in participants' delivery of their own substantive projects.

Virtual Workshops

(Saturdays, 9 am–12 pm and 1 pm–4:30 pm US Central Time)

January 29, 2022 – Global Middle Ages – Geraldine Heng[1]
February 26, 2022 – Interdisciplinary Studies – Lisa Fagin Davis[2]
April 2, 2022 – Workflows and Labs – David Fredrick[3]
April 30, 2022 – Patrimony and Preservation – Jaime Molina Vidal[4]
September 17, 2022 – Digital Stories and Histories – Sean Perrone[5]
October 22, 2022 – Neuropsychology in Immersive Worlds – Victor Schinazi[6]
November 19, 2022 – Indigenous Peoples and Inclusion[7]
January 28, 2023 – Gender in Immersive Environments – Dorothy Kim[8]
February 25, 2023 – Digital Ethnography[9]
March 25, 2023 – Choreographing User Movement – Tracy Fullerton[10]
April 29, 2023 – Project Management – Madeleine Casad[11]
September 16, 2023 – Student Learning – David Neville[12]
October 14, 2023 – Digital Documentation – Lisa Snyder[13]
November 18, 2023 – Global Middle Ages Community – Catherine Holmes[14]

[1] (Heng, 2014, 2021; Martínez-Dávila *et al.*, 2017; Barrington and Hsy, 2018; Holmes and Standen, 2018; Psarra, 2018; Lomuto, 2020; *Cambridge City Seminar: The Venetian Experience*, 2021; Martinez-Davila, no date b, no date a)

[2] (Forster, 1978; Hunt, 1986; Huang and Huang, 2013; Amer and Ramey, 2018; Wang, 2020; Nast, 2021; Norako, no date b, no date a; Virtual Angkor, no date)

[3] (Di Pressi *et al.*, 2015; Ramey and Panter, 2015; Svensson, 2016; Breithaupt, 2017; Keralis, 2018; Pawlicka-Deger, 2020; Bell, 2022)

[4] (UNESCO, 2009; Evens and Hauttekeete, 2011; López-Menchero and Grande, 2011; Bendicho, 2013; Pietroni and Ferdani, 2021; Resco, 2022; Vidal, 2022; Extended Matrix, no date)

[5] (Mahuta, 2012; Wall, 2014, no date; Apollonio, 2016; Arguing with Digital History working group, 2017; Koke, 2017; *Digital Narration of 'La Mota' (Virtual Plasencia) accompanied by the Texas Early Music Project*, 2017; Huffman, Giordano and Bruzelius, 2019; Perrone and Traynor, 2021; Cocq, 2022; Economist, 2022; Kynn and Gasdia, no date)

[6] (Weisberg *et al.*, 2014; Schinazi, Thrash and Chebat, 2016; Grübel *et al.*, 2017; Kraemer *et al.*, 2017; Hackman *et al.*, 2019)

[7] (Brown, 2007; Cameron and Kenderdine, 2007; Smith, 2012; Massanari, 2015; Pinckard and Fernández-Vara, 2015; Roberts, 2015; Gish Hill and DeHass, 2018; Cocq, 2022; Molinari, 2022; Mukurtu, no date)

[8] (Boyd, 2014; Kenderdine, 2015, 2018, no date; Wernimont and Losh, 2018; Chang, 2020; Stanney, Fidopiastis and Foster, 2020; Kim, 2021b, 2021a)

[9] (Presner, 2014b, 2014a; Kim, 2018; Nieves, 2018b, 2018a, no date; Colonial Williamsburg, no date; rubenbristian.com, no date)

[10] (Fullerton, 2020)

[11] (Tabak, 2017; Wilson, 2020)

[12] (Neville, 2015; Neville *et al.*, 2020)

[13] (Castejón y Martínez de Arizala, 1950; Snyder, 2014; Moore, Rountrey and Scates Kettler, 2022; Papadopoulos and Schreibman, no date; *Córdoba en el siglo X*, no date)

[14] (Holmes and Standen, 2018; Lambourn, 2018; Prange, 2018; Alebachew Belay, 2020; Berend, 2023; Wen, 2023)

In-Person Workshops

July 13–16, 2022 – University of Colorado, Colorado Springs, Colorado
July 12–15, 2023 – Vanderbilt University, Nashville, Tennessee

Each virtual workshop, conducted on Saturdays to accommodate participants' work schedules, was divided into a morning session (9 am–12 pm) followed by a lunch break, and an afternoon session (1 pm–4 pm). Morning sessions, directed by Dr. Lynn Ramey, were dedicated to seminar presentations and discussions of thematic, theoretical, and methodological issues associated with immersive technologies and the Global Middle Ages. Invited speakers played prominent teaching and facilitation roles, allowing participants to explore topics such as digital storytelling, immersive worlds as cultural patrimony, neuropsychological considerations for mimicking the real world, game design processes, and the representation of diverse peoples. Prior to each workshop, participants completed assigned readings and prepared relevant assignments, such as descriptive and analytical documentation or virtual model constructions. Afternoon sessions, taught by Dr. Martinez-Davila, focused on direct instruction in using SketchUp Pro to construct cultural artifacts, objects, structures, and environments.

The two summer in-person workshops emphasized advancing each participant's immersive world constructions. Travel, airfare/ground transportation, hotel accommodations, and meals were covered for each participant and the non-resident co-PI. The Institute's virtual curriculum maximized digital instruction by leveraging Dr. Martinez-Davila's extensive expertise in digital education, applying the OLC's Quality Course Teaching and Instructional Practice Scorecard.

Further, given the unpredictability of the COVID-19 pandemic, the Institute was adapted to facilitate participants' full engagement regardless of their ability to travel. The majority of the Institute occurred in a virtual setting, and the summer in-person programs were designed to transition seamlessly to virtual formats if necessary. To address potential participant Internet connectivity issues, all virtual workshops were recorded (via Zoom) so that absent participants could review missed content. In the unlikely event of a UCCS or VU Internet service disruption, virtual workshops were rescheduled to the Saturday following the originally planned date.

Appendix B: Bibliography

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