



REPORT ON

Deliverable 4.3

Living LAB on Immersive experience – Virtual tour & Storytelling

UNIVPM



General information	
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About DCbox

DCbox “Digital Curator Training & Tool Box” works to create a new generation of European professionals working in the cultural heritage sector, equipped with a recognised, cross-cutting and high-level digital skillset. The project is funded by the Erasmus+ programme of the European Union during the period November 2021 - May 2024.

DCbox is implemented by:

- Università Politecnica delle Marche (Italy) - coordinator
- Sinergia Consulenze Srl (Italy)
- University of Cordoba (Spain)
- The Cyprus Institute (Cyprus)
- Universidade Lusófona/COFAC – Training and Cultural Animation Cooperative (Portugal)
- UNIMED – Mediterranean Universities Union (Italy)
- University of NIS (Serbia)

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Erasmus+ Programme
of the European Union

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Executive Summary

This document represents a textual synthesis of the Del 4.3, Living LAB on Immersive experience – Virtual tour & Storytelling

Prototypes of virtual experiences were collaboratively designed, created, and tested in the Virtual Open TOOLBOX and in presence through specific living LABs, each experimenting with digital tools to access, understand, and share cultural content related to various heritage features. The primary goal is to familiarize students with digital cultural heritage (DCH) tools, providing them with a cross-disciplinary confrontation experience and a DCH toolkit for their future careers. The key outputs of this result are the prototypes, which functioning is explained in the videos that were prepared by the teachers and students by each academic partner. The present document serves to summarize the steps and learning experiences for both students and teachers.

The present document is complemented by a playlist in Youtube DcBox channel, in which is possible to see the Prototypes in action:

<https://youtube.com/playlist?list=PLqd6hOCBhPvgBi12HiHzy4Qf29jYd9iXo&si=cBn3Vr6YKXo-yP1i>

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Result 4 - Virtual experiences Prototypes

The Leader of the PR4 Virtual Prototypes is UNIVPM, so it served both as coordinator of the PR4 preparing all the templates materials for the Living Labs management and reporting, but also piloting some activities in advance respect of the other partners.

According to the application form a minimum of 4 and a maximum of 8 students should have access to each living LAB: the UNIVPM living Lab reached the result of 5 students working actively in the virtual Lab and producing their prototype, with an important involvement of associated partners both in the case of hosting a trainee and in the case of supporting the implementation of the project work.

The Living LAB on Immersive experience managed by UNIVPM long lasted a comparable timing to what was expected by the initial GANTT, but it was decided to leave it open further in order to ensure the possibility to develop at the best each prototype. The real conclusion of Living Lab was the Multiplier Event by UNIVPM, that was held on 13rd November 2023. By the content point of view, teachers and students collaborating in the Living Lab decided to adhere to the technology initially foreseen but also tried to enlarge the spectrum of the possibilities in Digital Cultural Heritage. Thus, Virtual tour, still considered a leading prototype for facing the challenges of pandemic scenario, allowed to produce immersive scenes also with low-cost procedures (360° photos & videos). Similar applications were also paired with HBIM tools, immersive technologies and wearable devices as well as GigaPixel contents. This approach ensured to test different solutions and learning experiences in the digital curation domain and was also triggered by the students request to work with cutting-edge software environment.

As part of the living lab on Immersive experience – Virtual tour & Storytelling, it can be also reported the learning experience made during the **#ErasmusDays** hosted by UNIVPM on **October 13th** at the **Faculty of Engineering in Ancona**, within the **Architectural Drawing Course** held by Professor Ramona Quattrini. The highlight of the day was the introduction of the **VR Module (D 3.4)** within DCBox, marking a new chapter in information accessibility. Students by the 1st year of the Architecture-Building Engineering course collaborated to create innovative virtual reality experiences, each narrating some **aspects and places of Ancona's heritage**. In order to interact with the prototypes made by the students during this ex- tempore design work, you can have access in guest mode to: <https://moodle.dcbox.eu/course/view.php?id=23>

The bootcamp

On **9th of December 2022**, third day of the Learning Training Activity in Lisbon, a Boot Camp and international conference took place. Participants included DCbox partners, students, cultural heritage professionals, and Portuguese museum representatives. Discussions focused on the DCbox

approach, expected outcomes, activities, and the digital skills needed for future professionals in the creative and cultural sectors. Prof. Ramona Quattrini introduced the project, followed by presentations from the Cyprus Institute, Università Politecnica delle Marche, University of Cordoba, and University of Nis, showcasing their work in digital cultural heritage. Stakeholders from Lourinhã, including a local museum and NGO, also presented. The event marked the start of the DCBox Result 4 activities with an online Bootcamp and a design thinking phase for Digital Cultural Heritage experiences. The hybrid workshop had 20 in-person attendees and 31 online participants.

Additional bootcamp and meetings with the museum curators and directors were held at the local level considering the wide range of case studies the UNIVPM students and teachers addressed during the DCbox Living LAB.

The implementation of the prototypes inside the unit

With the aim of engaging an adequate number of sufficiently motivated students to the learning path on digital curator, a call was launched within UNIVPM. This call was communicated through posters inside the faculty premises, posts on the social networks of the course of study in Building Engineering-Architecture (EA), and through student associations. In order to facilitate the students' involvement, the EA course recognized 2 ECTS among the free-offer credits to students who would complete the MOOC DCbox course.



Beside this communication activities addressed to all the students, a tutoring work tailored to the various situations of student's career was ensured. This conducted to the involvement of different profile of students, participating in the Living Lab: 2 students from the course in "Digital Documentation of Cultural Heritage", 1 worker-student (teacher in a high-school looking for up-skilling) already graduated and enrolled only in the same course, 2 students participating in the Living Lab during the Master thesis preparation. This effort by the teachers and tutors in UNIVPM allowed a perfect match between project activities and curricular requirements and learning interests of the students. The tutoring and reviews during the Living Lab foresaw a mixed approach: online activities, in presence at the Univpm faculty and on-site activities dealing with the case study, partially implemented with traineeship (R5). In particular these activities concerned both data collection and acquisition, contents preparation and verification with the associated partners as well as testing of application.

For the details on the single students experience in the Living Lab, see the D5.1 Training & report Each university.



The hackathon

Since the application form, at the end of the VLab activities an Open Hackathon (M21) was foreseen in order to ensure to give visibility to students' activities and also to test the prototypes with final users of DCH experiences. During the implementation of the project the Hackathon has took place in a blended mode. Since it was synchronized with a project meeting held in July 2023 in Ancona, Italian students took part physically to the Hackaton while the other joined virtually the Toolbox and some videoconferences tools (MS Teams) were used. Here follows the agenda.

Thursday 20th of July 2023 – OPEN HACKATON for STUDENTS' PROTOTYPES
Facoltà di Ingegneria - C-LAB, ROOM C-Class q 155

Hours	Title	Partner	Contents
9.00 - 9.30	Registration of participants and welcome	UNIVPM	
9.30 - 9.40	Opening Remarks	UNIVPM	Francesco Fatone –Delegate for Research Engineering Area and international ranking Enrico Quagliarini - DICEA Director Ramona Quattrini – DCBox LP scientific responsible
9:40	Rita Santos	LUSO	<i>Museum Bordalo Pinheiro</i>
9:50	Edson Lourenço	LUSO	<i>Lourinhã Museum</i>
10:00	Theo Shaheen-McConnell (also on behalf Benjamin Adoba Ayida)	CYI	<i>Historical Forests of Troodos</i>
10:10	Natalie Milanese Branca	CYI	<i>Leventis Gallery</i>
10:20	Nicolette Vollero Levy (also on behalf of Biyang Wang)	CYI	<i>Ottoman balconies of Old Nicosia</i>
10:30	Soodabeh Sajadi	CYI	<i>Cultural landmarks of Nicosia</i>
10:35	Q&A		
10:40	Martina Manfroni	UNIVPM	<i>Civic Gallery - Ascoli Museum system</i>
10:50	Luca Bondi	UNIVPM	<i>Auditorium Pedrotti - Pesaro</i>

11:00	Sofia Diomedi (pres. By Mirco D'Alessio)	UNIVPM	<i>Numana Antiquarium</i>
11:10	Ludovica Leonardi (pres. By Renato Angeloni)	UNIVPM	<i>Civic Gallery Ancona</i>
11:20	Q&A		
11.30 – 12.00	Coffee Break		
12:00	Marina Marín Expósito + Álvaro Arteche (pres. by Massimo Gasparini)	UCO	<i>Sculpture collection of Roman town of Mellaria</i>
12:10	José Manuel Ordoñez Sojo (pres. by Massimo Gasparini)	UCO	<i>Epigraphic collection of Roman town of Mellaria</i>
12:20	Aleksandra Stojkovic	NIS	<i>Museum of Ponisavlje</i>
12.30 – 12.45	VR Tool Presentation and Prototypes Final Delivery definition	UNIVPM	Presentation of the VR Tool integrated in LMS. Final delivery requirements and time scheduling
12.45 – 13.00	Q&A		
13.00 – 13.15	Concluding Remarks	UNIVPM	

As it is clear in the agenda, the hackathon was conceived to engage students in a collaborative and interdisciplinary environment where they design and develop virtual experiences for cultural heritage sites using digital tools. The hackathon aims to foster creativity, problem-solving skills, and practical application of digital cultural heritage (DCH) technologies.

The students were invited to highlight in their speech open Points and challenges: each student or team documented ongoing challenges, such as technical limitations, user experience design, and content accuracy.

A Demo Session for testing and feedback the more robust and advanced prototypes was held, in which some teams presented their mock-up to peers, mentors, and a panel of judges, some live demonstrations to showcase functionality and user interaction.

A feedback loop with constructive critique from judges focusing on usability, innovation, and cultural relevance was also provided.

The Q& A session was intended as a discussion and wrap-up, it included summary of key takeaways from the hackathon and networking session to foster future collaborations and a discussion on the possible exploitation of the VR module in the LMS.

Not all the students participating in the Living Labs were able to connect or be present in the hackathon, especially because some students were involved later than the initial schedule. However, the leader of R4, UNIVPM, decided to keep the conduct of the living labs open, so as to ensure as many participants as possible and to retrieve some prototypes that, for individual students' career reasons, had not been completed before the hackathon. Summarizing the number of the students enrolled in the DCbox learning path, as reported in the D 5.1 Training & report Each university, is higher than the students participating in the hackathon.

In order to receive the students' feedback, some interviews were collected, see:

<https://www.youtube.com/watch?v=o4VuMwhbi4Y&t=14s>

https://www.youtube.com/watch?v=dOOvUGD_OtQ&t=1s

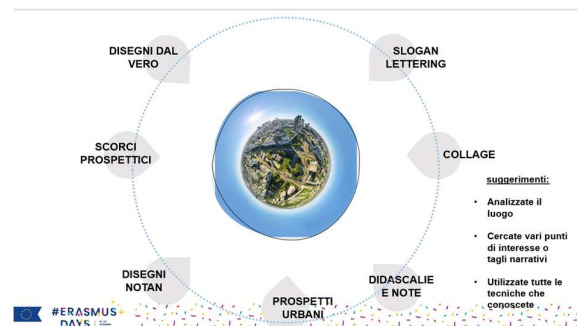
The prototypes implemented in the VR Module of the LMS

An additional achievement of the UNIVPM Living Lab is the involvement of the students of the 1st year of Building Engineering-Architecture course in an innovative learning experience, based on the VR Module of the LMS.

The idea on the basis of the workshop was to develop interactive immersive experiences using the LMS's functionalities. During Erasmus days, over 40 students utilized the VR tool to create immersive experiences about 8 heritage sites in Ancona, combining hand-drawings and digital illustrations with a panorama interface. Each group was equipped with a panorama, already prepared by the technicians of the DHeKalos Lab and was involved in different learning tasks and activities related to represent and document the assigned spaces: one activity was to sketch from life the architecture or one part of it, another activity was to prepare a drawing merging different techniques such as Notan, collage or text-drawing illustration.

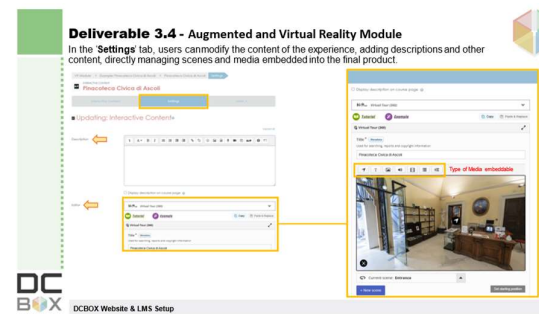
After these preparatory learning activities, held in the previous weeks, on **October 13th 2023**, the workshop was open by an introduction of the **VR Module** within DCBox, marking a new chapter in information accessibility. Students collaborated to create **innovative virtual reality experiences**, each narrating a **unique aspect of Ancona's heritage**.

Here the didactic materials used for the workshop:

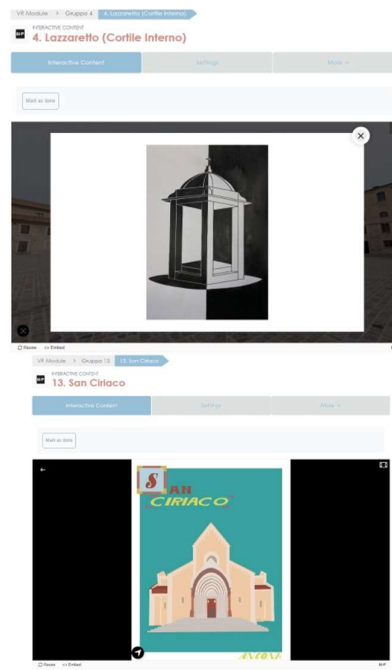
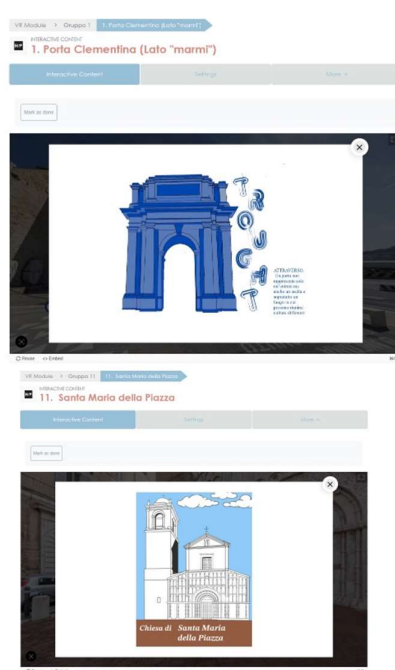


- ARCO di TRAIANO
- PORTA CLEMENTINA
- DUOMO DI SAN CIRIACO
- LAZZARETTO
- PORTA PIA
- SANTA MARIA DELLA PIAZZA

ADRIJO.EU
SKETCHFAB - ACCOUNT ADRIJO



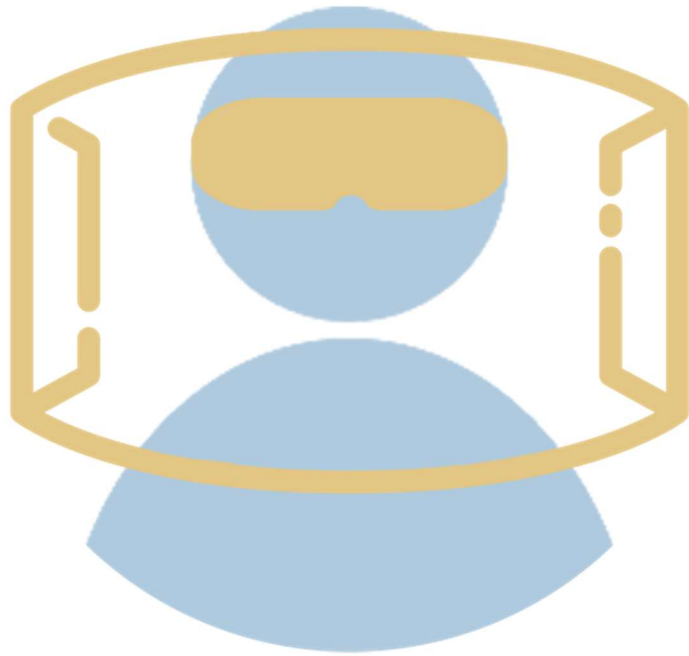
Here a gallery of the contents implemented by the students:



The results of this learning experience and the prototypes implemented as VR experiences are also accessible in the LMS platform (<https://moodle.dcbox.eu/course/view.php?id=23>): it is sufficient to login as guest and browse the list of the panoramic tours.

A demo of the browsing is also provided here: <https://youtu.be/xF-9IIngI5Q?si=KmuNJ26jL06eEILc>.

Appendix - The prototypes presentation



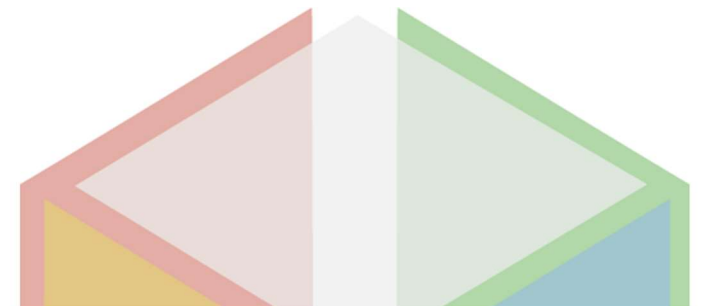
Living LAB
on
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Experience**



VR Auditorium Pedrotti

Luca Bondi

Università Politecnica delle Marche



VR Auditorium Pedrotti Case Study

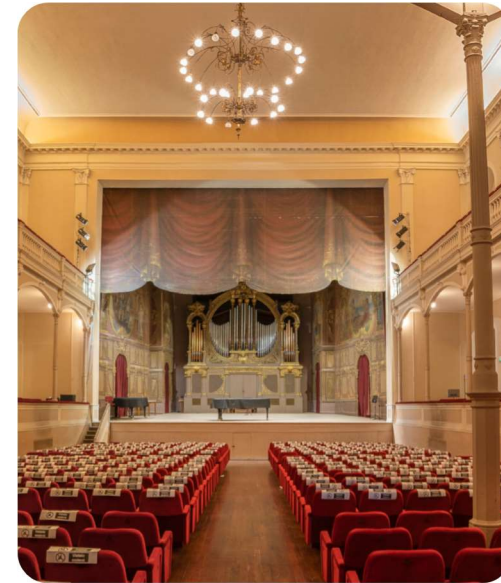
/ Palazzo Olivieri-Machirelli

Headquarter of the **Conservatory Gioachino Rossini** and the **Rossini Foundation**

/ Focus: Auditorium Pedrotti



Palazzo Olivieri-Machirelli



Auditorium Pedrotti

VR Auditorium Pedrotti

Available Materials

Building Survey – DICEA Dep.

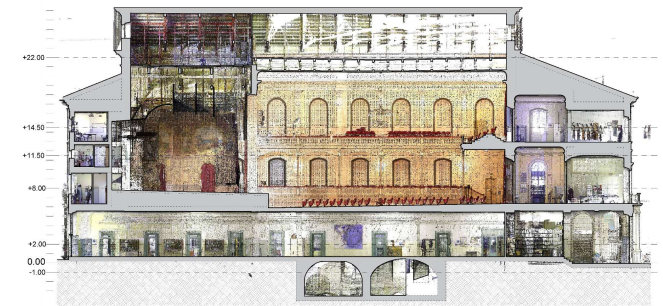
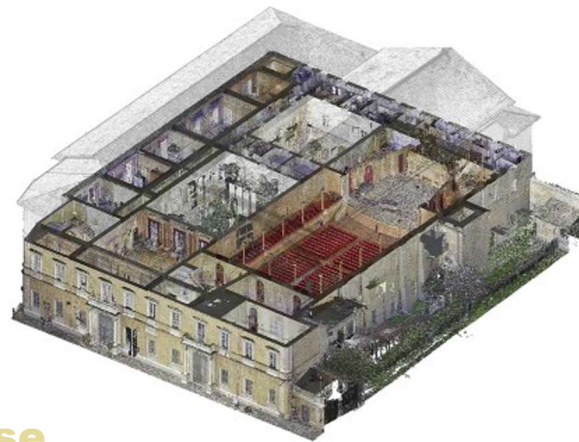
- **Point Cloud ed 2D Drawings**

Master Thesis - D. A. De Luca

- **HBIM Model**

→ **Digital Documentation Course**

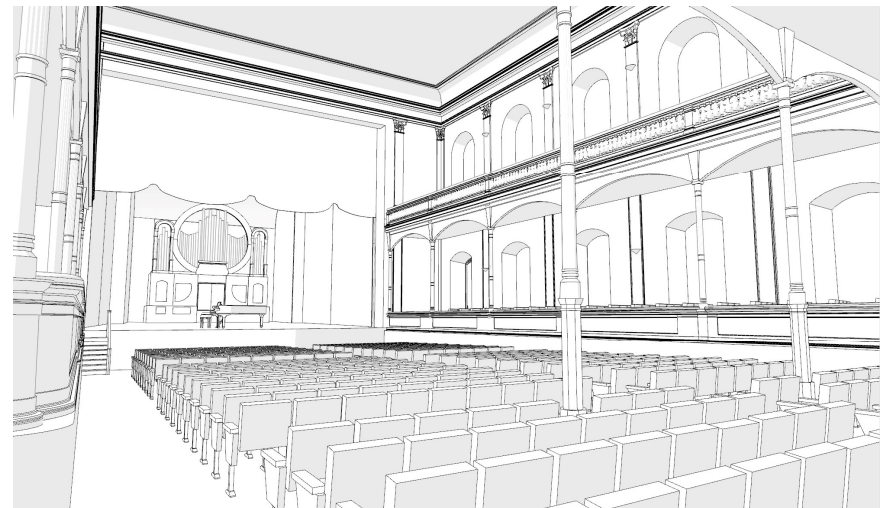
> **VR Auditorium Pedrotti App.**



TLS Survey

HBIM Modeling

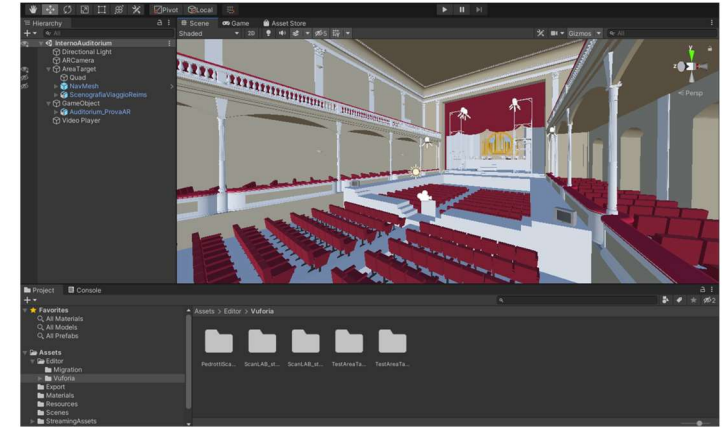
VR Application



VR Auditorium Pedrotti Prototype Requirements

Expand HBIM
modelling use for
Cultural Heritage

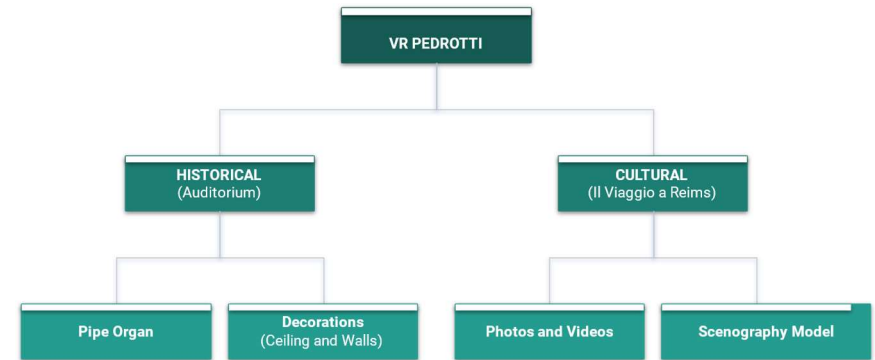
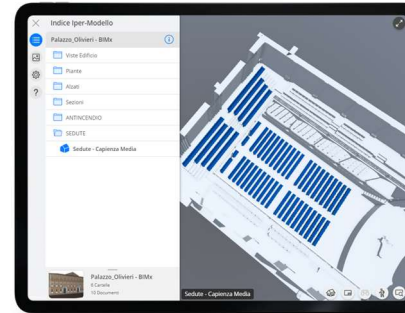
Narrate Tangible
and
Intangible Heritage



"Il Viaggio a Reims", 1984

VR Auditorium Pedrotti Workflow

1. Analysis of possible themes



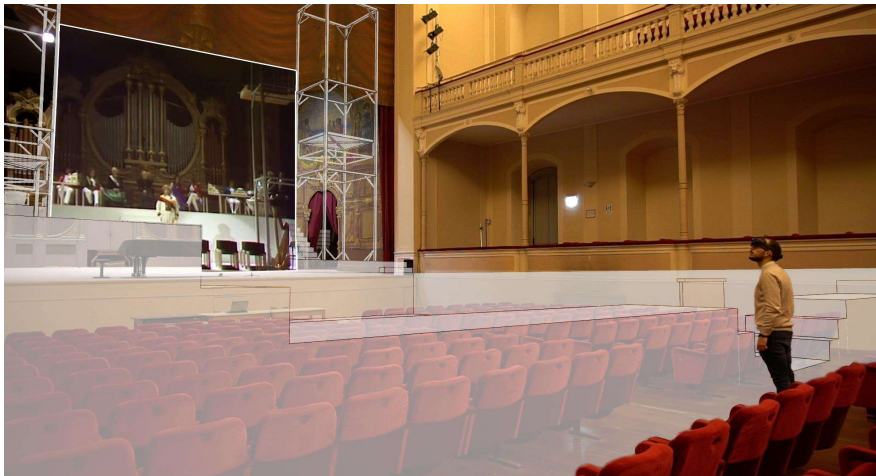
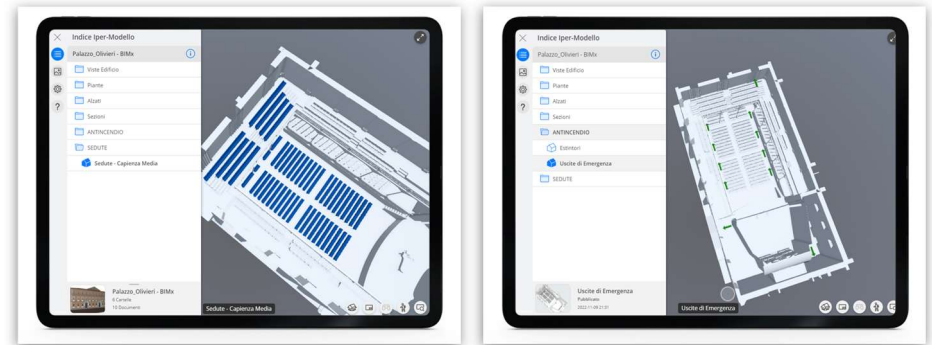
2. Project structure and Hotspot definition

3. Prototype development and testing



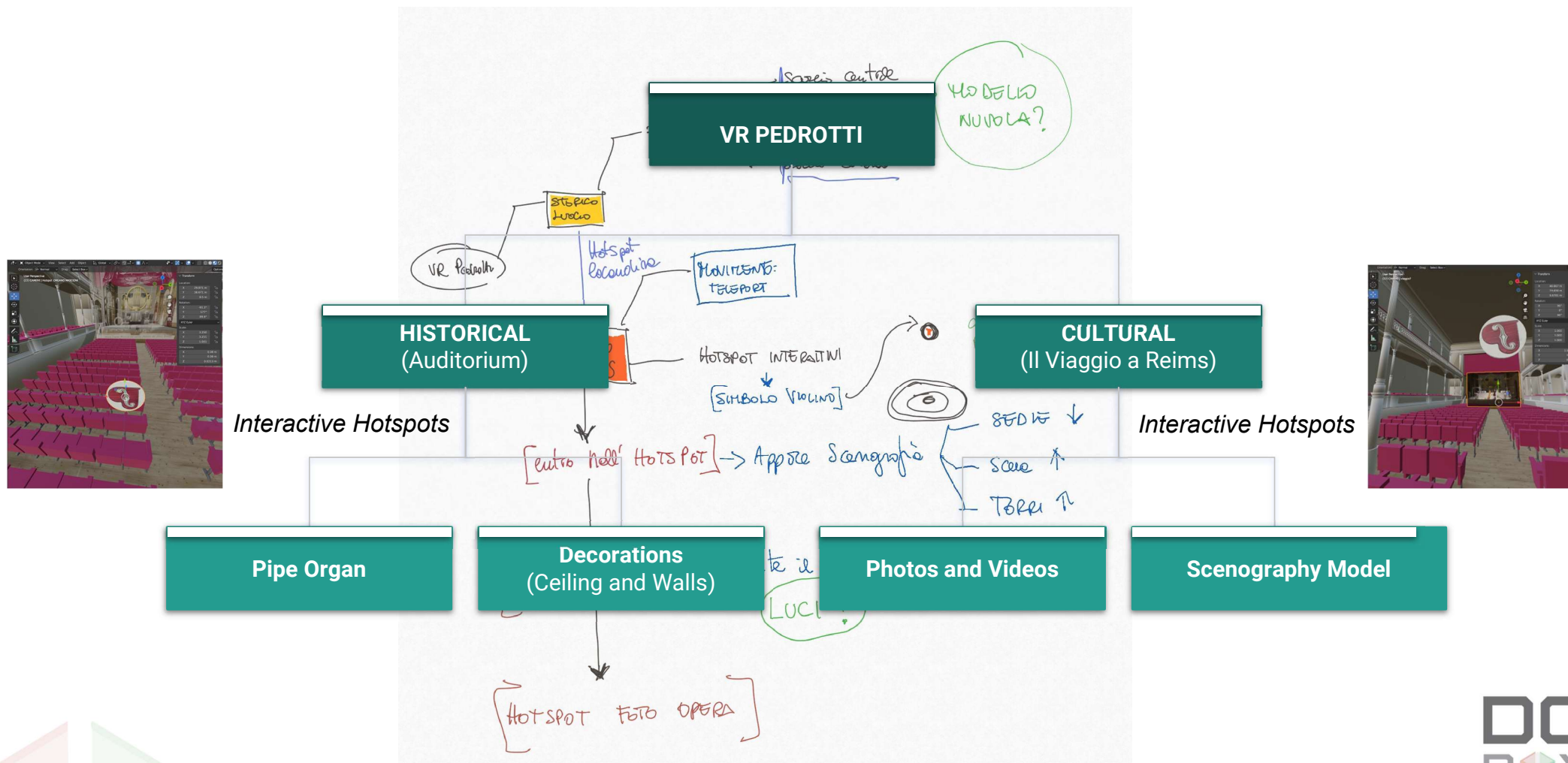
1. Analysis of Possible Themes

- VR for **Safety** (*Escape Routes*)
and **Event Management** (*Seat distribution*)



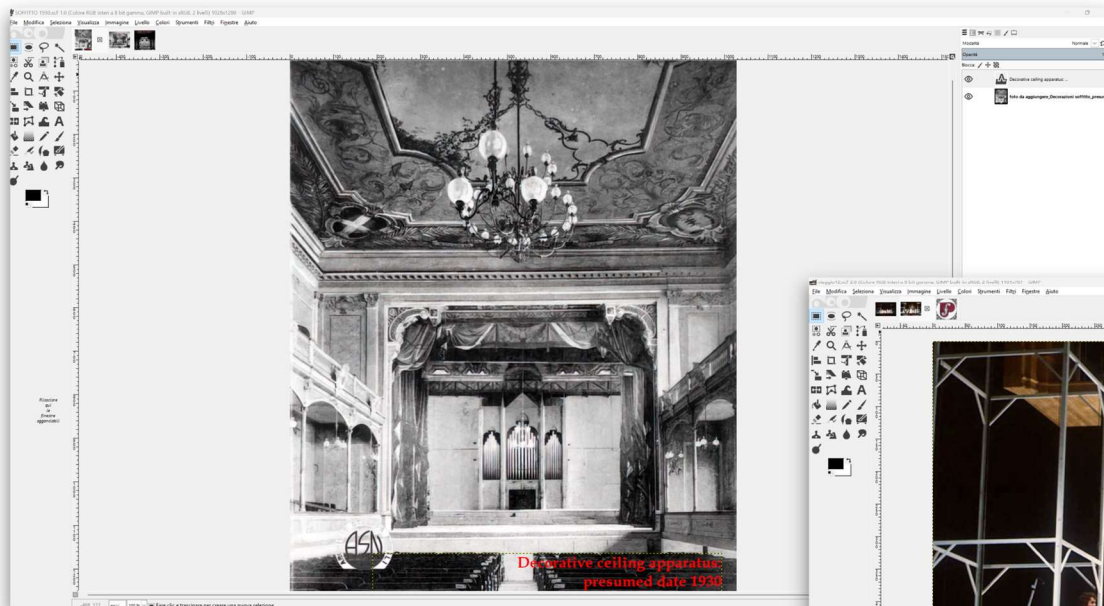
- VR for the **Enhancement of Historical & Cultural Values**

2. Project Structure and Hotspot definition



3. Prototype development and testing

Preparation of base material with GIMP and other software (images, video, audio, etc.);



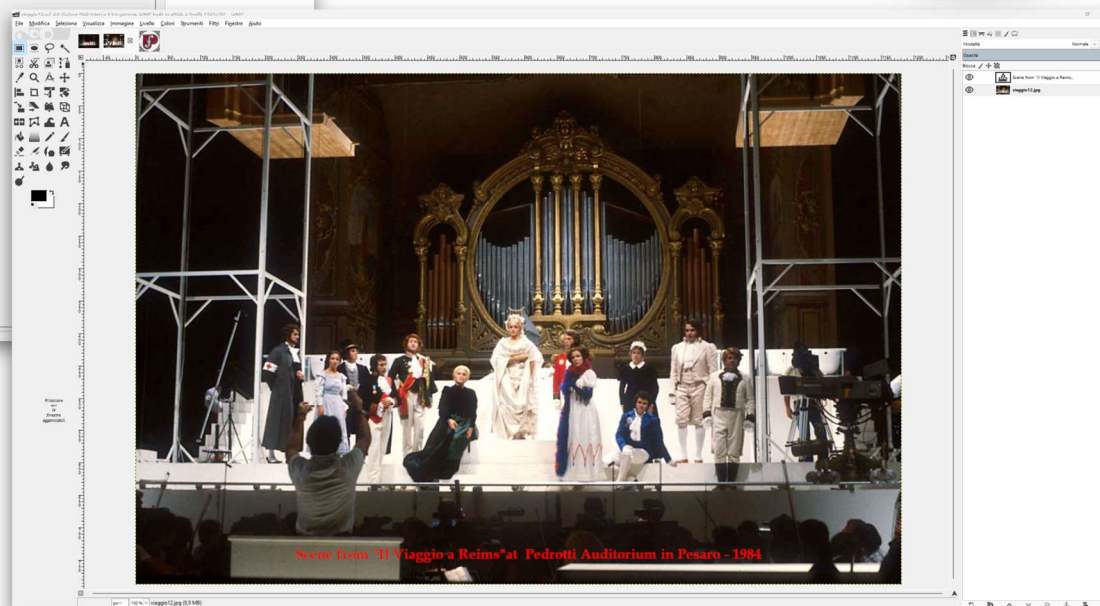
Historical Photos



Hotspot Images



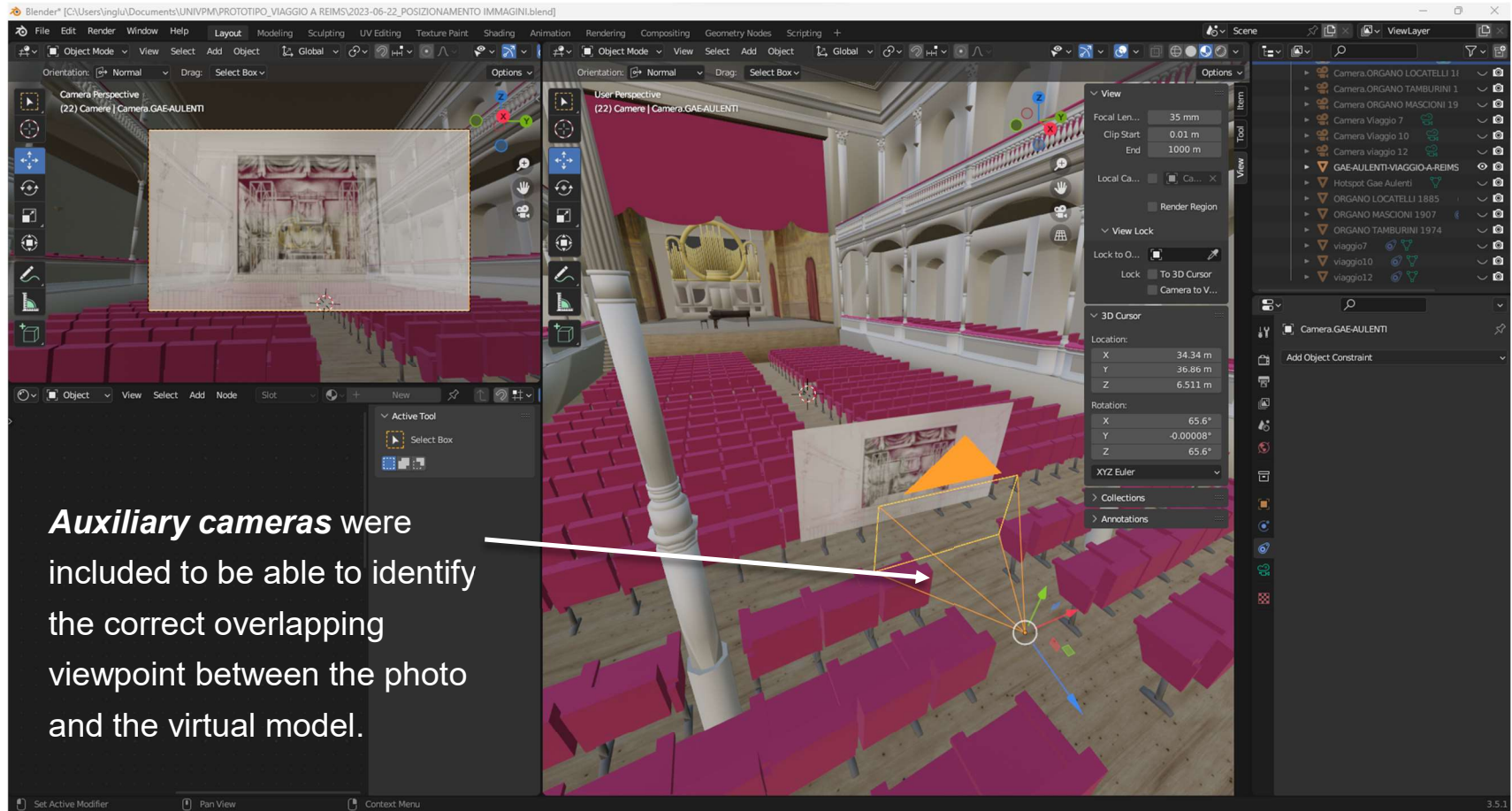
Alternative
Hotspot Images



Images of Rossini's Opera

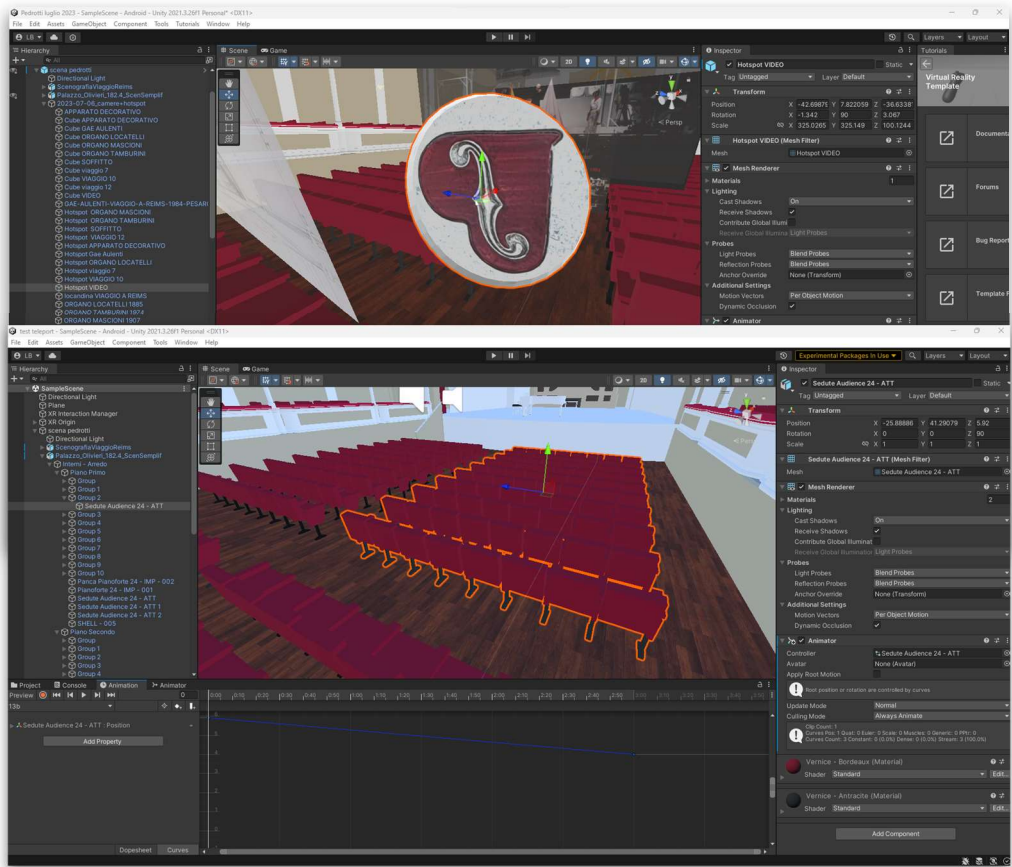
3. Prototype development and testing

Images Alignment in Blender

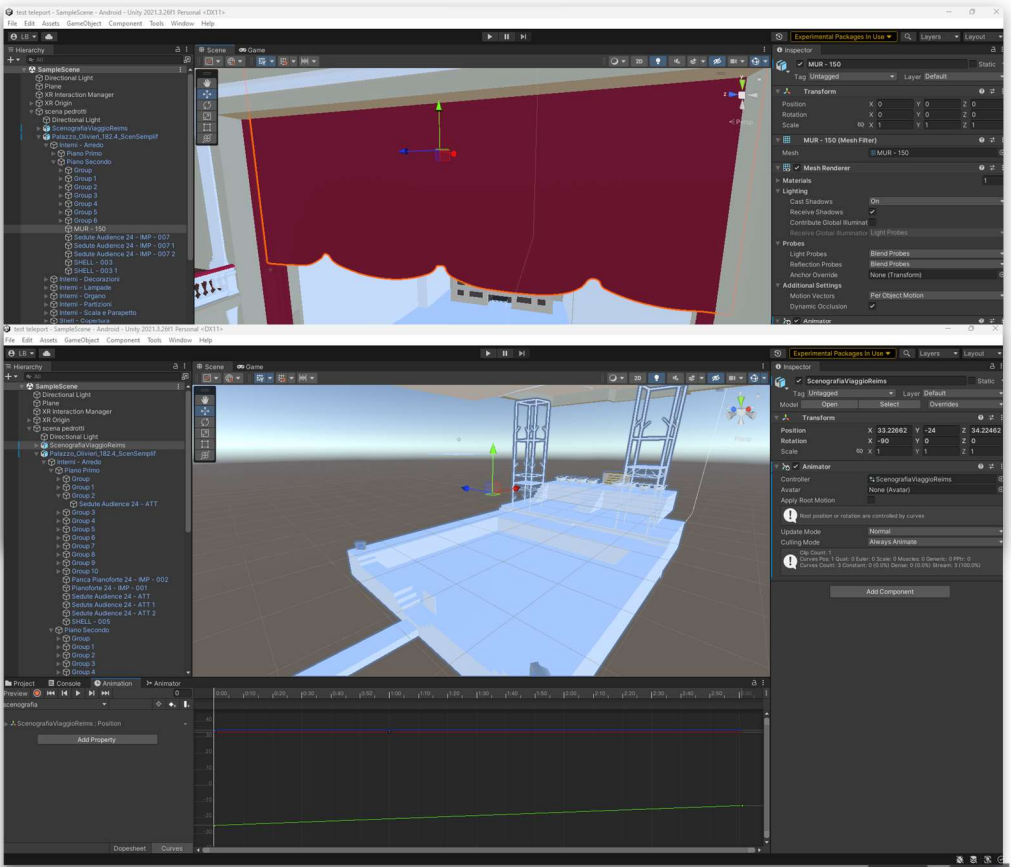


3. Prototype development and testing

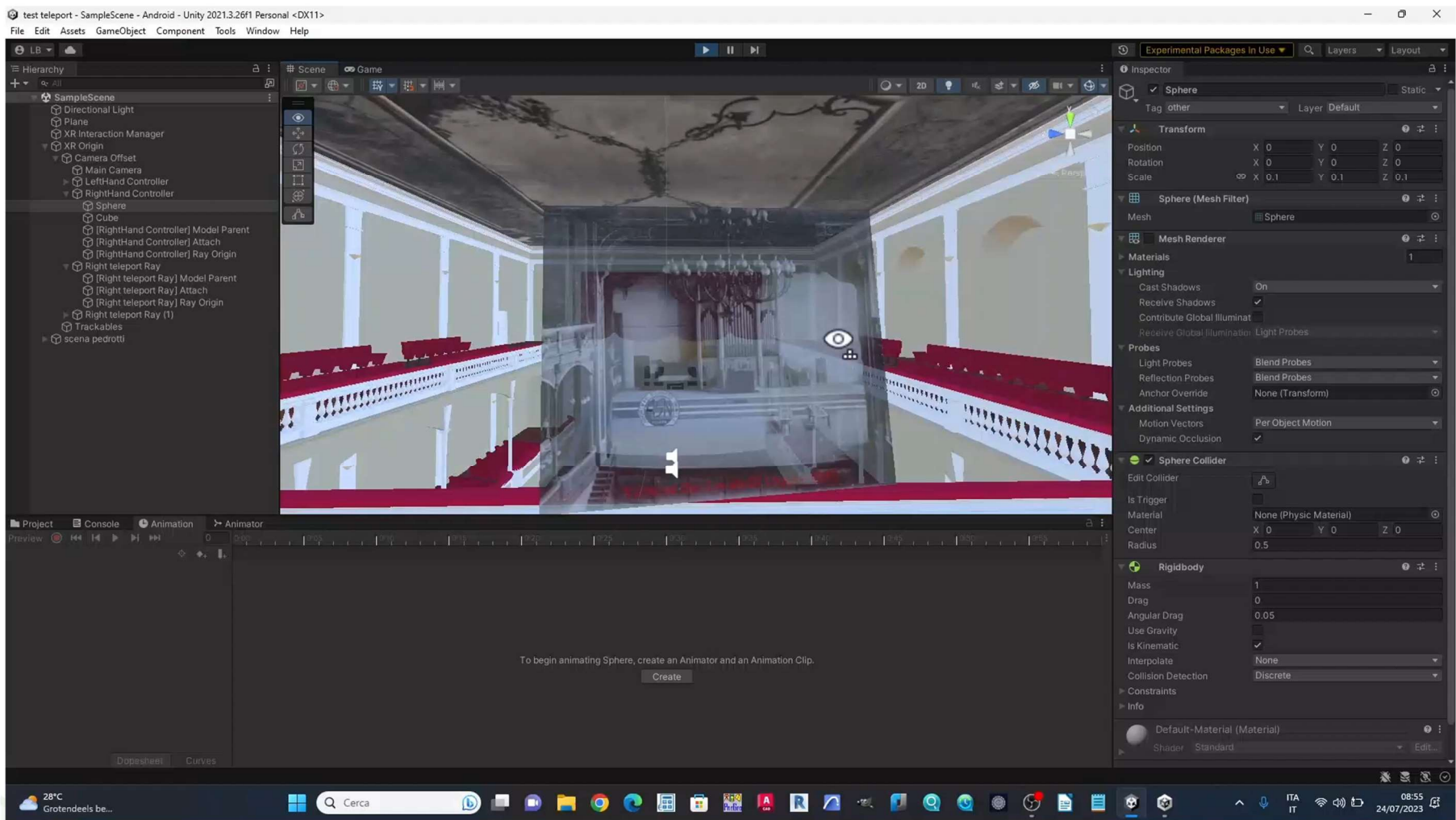
Animation and Scripting in Unity



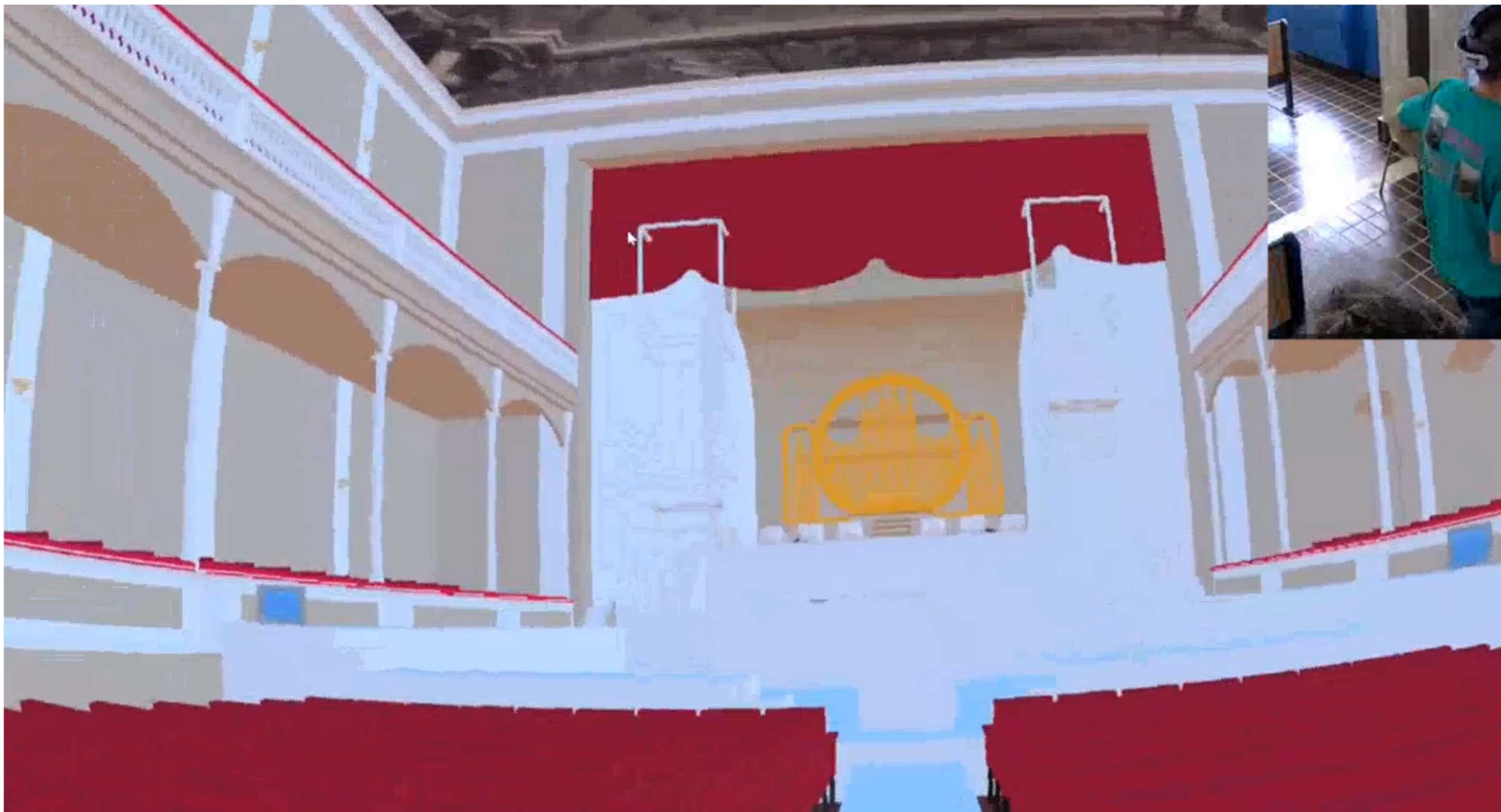
Seats Translation

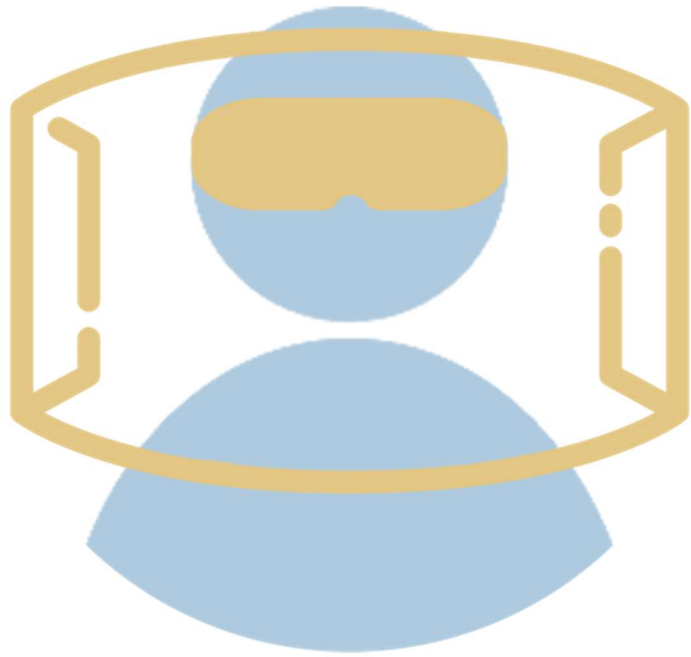


Scenography Translation



VR Auditorium Pedrotti





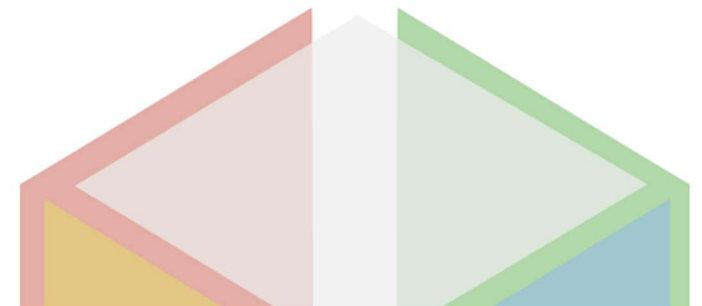
Living LAB
on
**Immersive
Experience**



THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Diomedi Sofia

Università Politecnica delle Marche



THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium of
Numana

The Tomb Of The
Picenian Queen Of
Sirolo - Numana

Virtual Reality
Applications

Cultural Accessibility



- Archeological Museum
- The Queen's Tomb,
found in Sirolo at “I Pini” in 1989
- Historical and Cultural Development
of Numana and the surrounding area

THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium of
Numana

The Tomb Of The
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Virtual Reality
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Cultural Accessibility



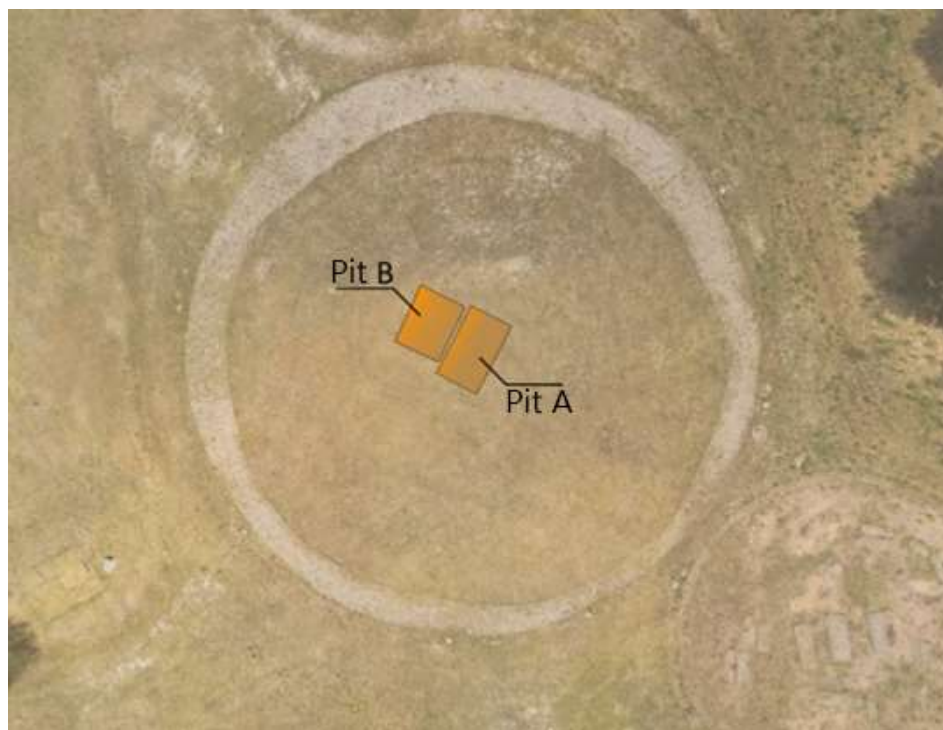
THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium of
Numana

The Tomb Of The
Picenian Queen Of
Sirolo - Numana

Virtual Reality
Applications

Cultural Accessibility



Pit A

Queen's grave with her
possessions



Pit B

House Tools and
Furnishing

THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium of
Numana

The Tomb Of The
Picenian Queen Of
Sirolo - Numana

Virtual Reality
Applications

Cultural Accessibility



- **Explore and Interact** with the objects
- **Enhance the Accessibility** for people with disabilities
- **Recreate Heritage Sites** and **Preserve History**

THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium of
Numana

The Tomb Of The
Picenian Queen Of
Sirolo - Numana

Virtual Reality
Applications

Cultural Accessibility

The Acquisition

PROGETTO CARIVERONA

- **27** Findings Acquired
- **48 Shoots** for each artefact
- **4000x6000px** Dimension of each shoot
- **0,03 mm** dimension of the pixel in the space
- Artefact Point Cloud Dimension:
50 000 000 points

THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium of
Numana

The Tomb Of The
Picenian Queen Of
Sirolo - Numana

Virtual Reality
Applications

Cultural Accessibility

The Acquisition

PROGETTO CARIVERONA

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THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium of
Numana

The Tomb Of The
Picenian Queen Of
Sirolo - Numana

Virtual Reality
Applications

Cultural Accessibility

PROGETTO CARIVERONA

Final Product

- RECONSTRUCTION OF THE QUEEN'S TOMB
- RECONSTRUCTION OF CONTEXTUALISE ARTEFACTS
- VIM - VIRTUAL INTERACTIVE MOVIE



THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium of
Numana

The Tomb Of The
Picenian Queen Of
Sirolo - Numana

Virtual Reality
Applications

Cultural Accessibility

First Interaction

Pickable objects



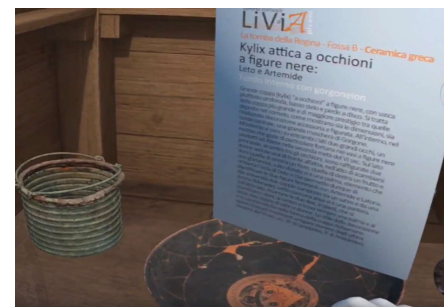
Second Interaction

Gravity Implementation



Third Interaction

Findings Description



THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium of
Numana

The Tomb Of The
Picenian Queen Of
Sirolo - Numana

Virtual Reality
Applications

Cultural Accessibility

- **Communicate findings' history to people with disabilities**
- **Create content based on research**
- **Create a mobile application used within the museum according to one's disability**



THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium of
Numana

The Tomb Of The
Picenian Queen Of
Sirolo - Numana

Virtual Reality
Applications

Cultural Accessibility

First Step

Descriptions in easier language

Second Step

Creation of audio for
each description

Third Step

Observe the artefact in detail while
playing the audio in the background
or reading the descriptive image



THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Made with
 unity

THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

THE TOMB OF THE PICENIAN QUEEN in NUMANA: a VR journey to learn about the findings

Antiquarium Numana

La Tomba della
Regina di Sirolo-
Numana

Applicazioni di
Virtual Reality

Accessibilità culturale

PROGETTO CARIVERONA

PROGETTO "ARCHEOPAESAGGIO AL CONERO": NUOVI SPAZI E NUOVE PRATICHE
PER SCOPRIRE, CONSERVARE E VIVERE IL TERRITORIO DEL PARCO CON IL
SOSTEGNO DI FONDAZIONE CARIVERONA



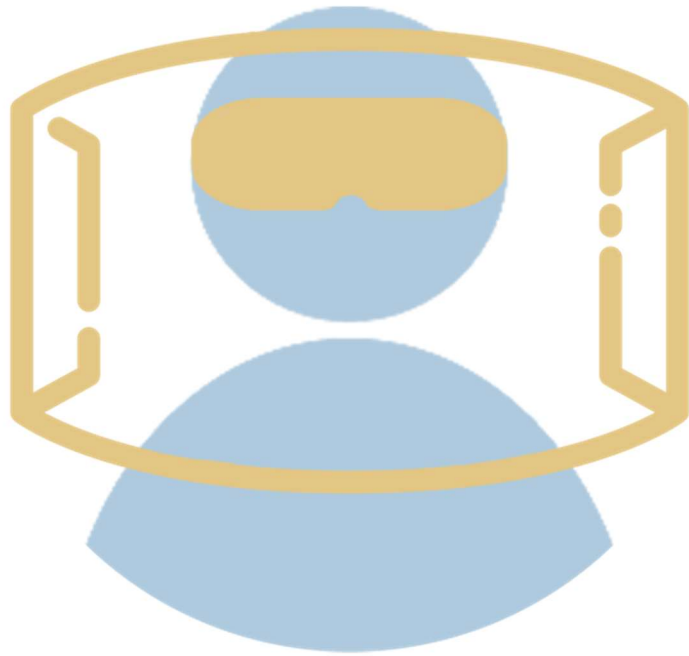
Soprintendenza AN-PU
Archeologia, Bella Arti
e Paesaggio delle Marche



DIREZIONE
REGIONALE
MUSEI MARCHE



FONDAZIONE
Cariverona



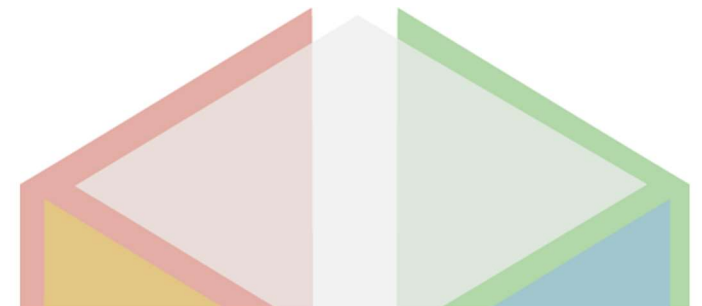
Living LAB
on
**Immersive
Experience**



SANT'ANSANO MULTISPECTRAL AR

Ludovica Leonardi

Università Politecnica delle Marche



Case Study

Sant'Ansano.

Type	→	Painting
Technique	→	Oil painting on canvas
Author	→	Unknown
Dimensions	→	95 x 100 cm
Dating	→	1600-1699
Localisation	→	Civic Gallery F. Podesti, Ancona
State of preservation	→	???



Sant'Ansano Multispectral AR

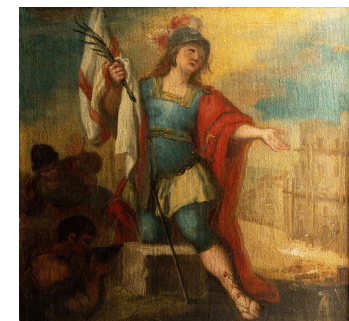
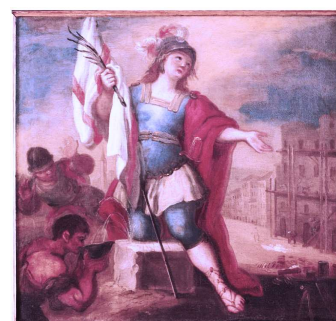
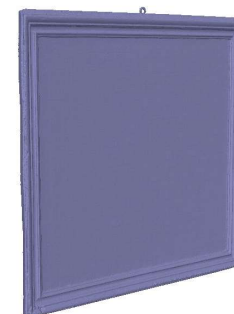
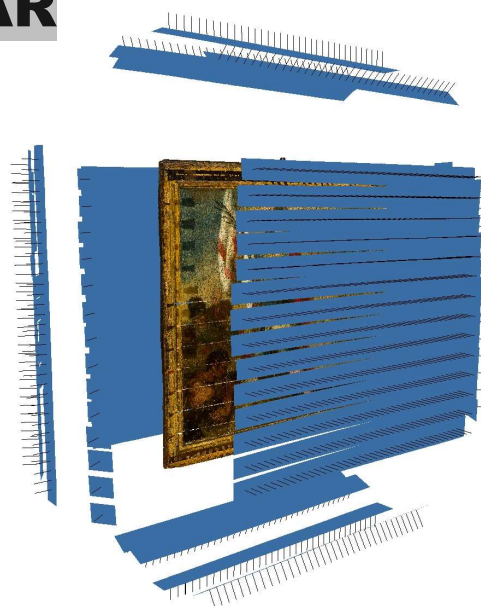


Sant'Ansano Multispectral AR

3D Model

3D Multilayer Model

Multispectral Layers



Sant'Ansano Multispectral AR

Structure from Motion Dense Multiview Reconstruction.

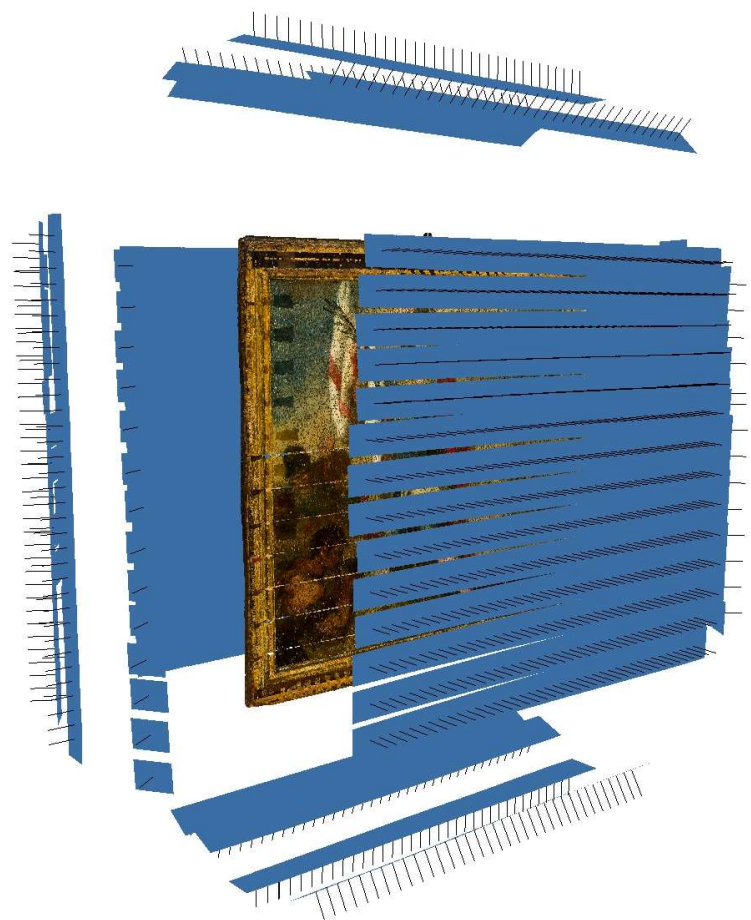
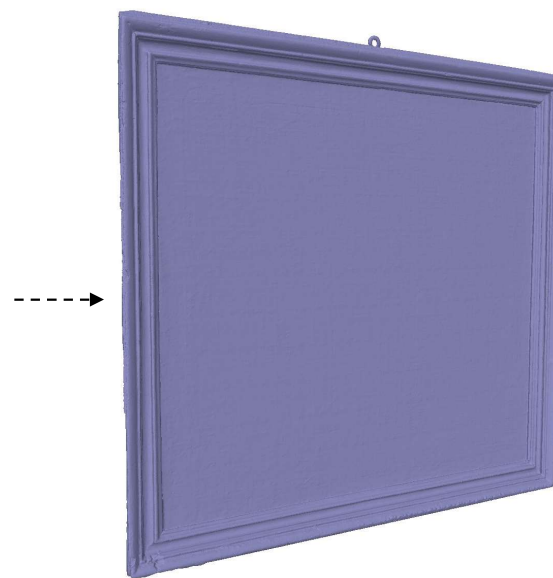
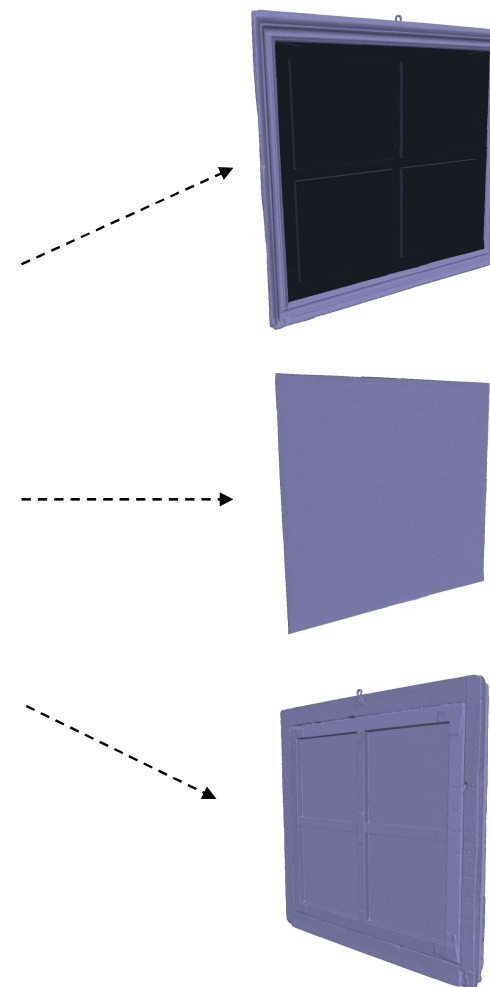


Image Acquisition



SFM
Reconstruction



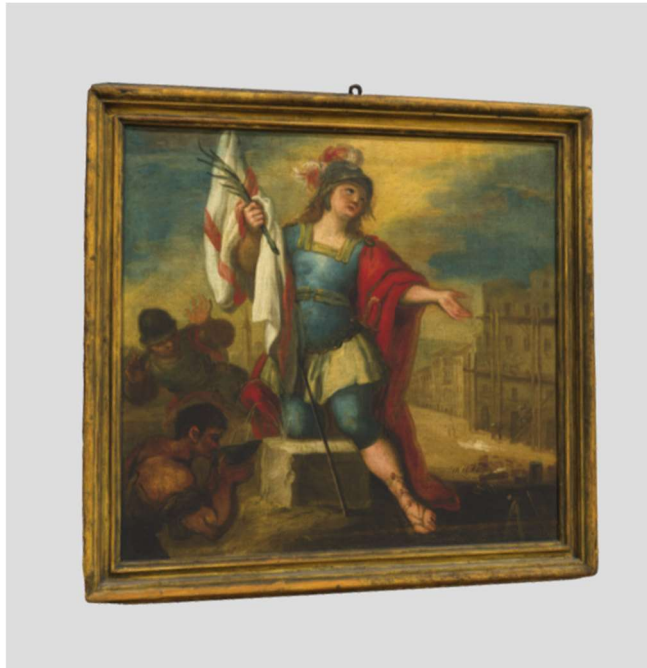
Frame

Front

Back

Sant'Ansano Multispectral AR

Structure from Motion Dense Multiview Reconstruction.

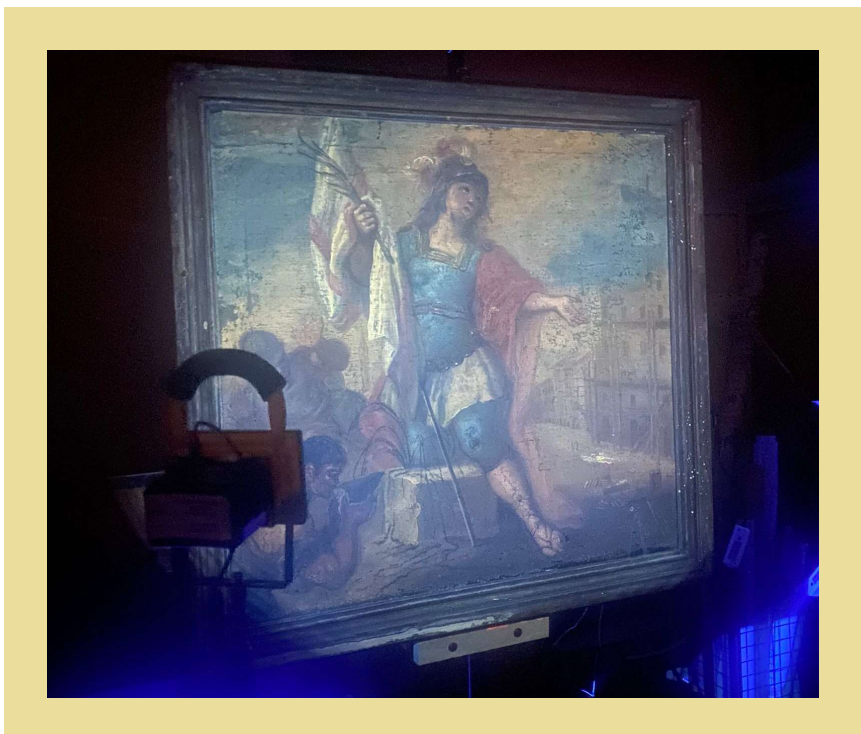


Civic Gallery F. Podesti of Ancona, Sant'Ansano.

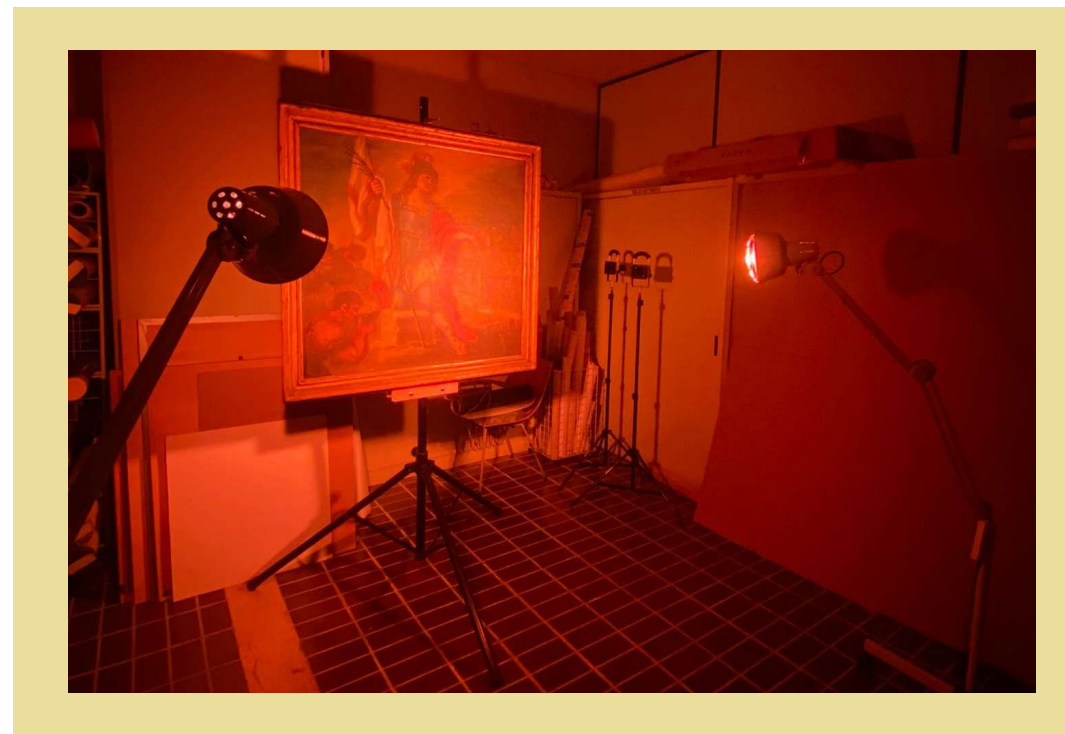
3D textured model using visible-light front and back images.

Sant'Ansano Multispectral AR

Multispectral Acquisitions



Ultraviolet light acquisition of the painting



Infrared light acquisition of the painting

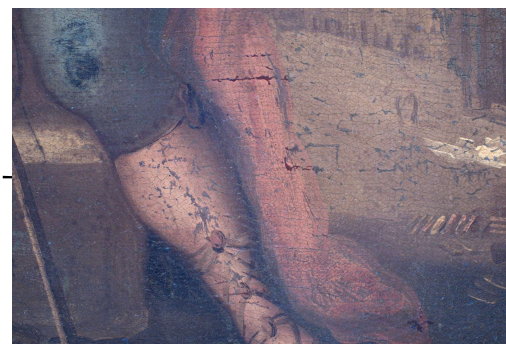
Acquisizioni svolte presso il laboratorio Dhekalos, all'interno dell'Università Politecnica delle Marche.

Sant'Ansano Multispectral AR

Multispectral Images



Oblique Light



UV-Induced Visible Fluorescence



IR Reflectography



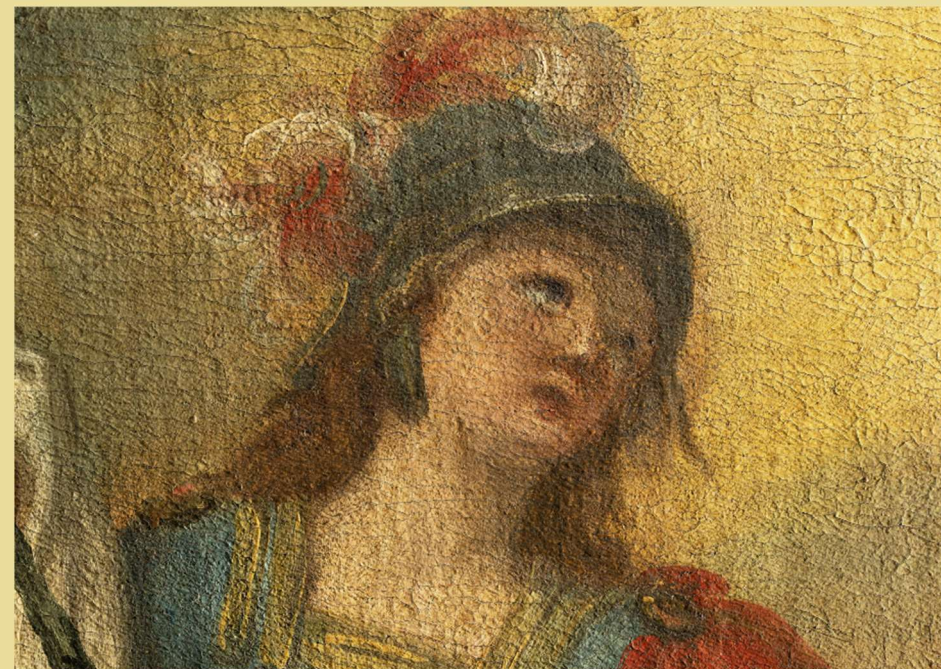
Sant'Ansano Multispectral AR

Multispectral Imaging – Oblique Light



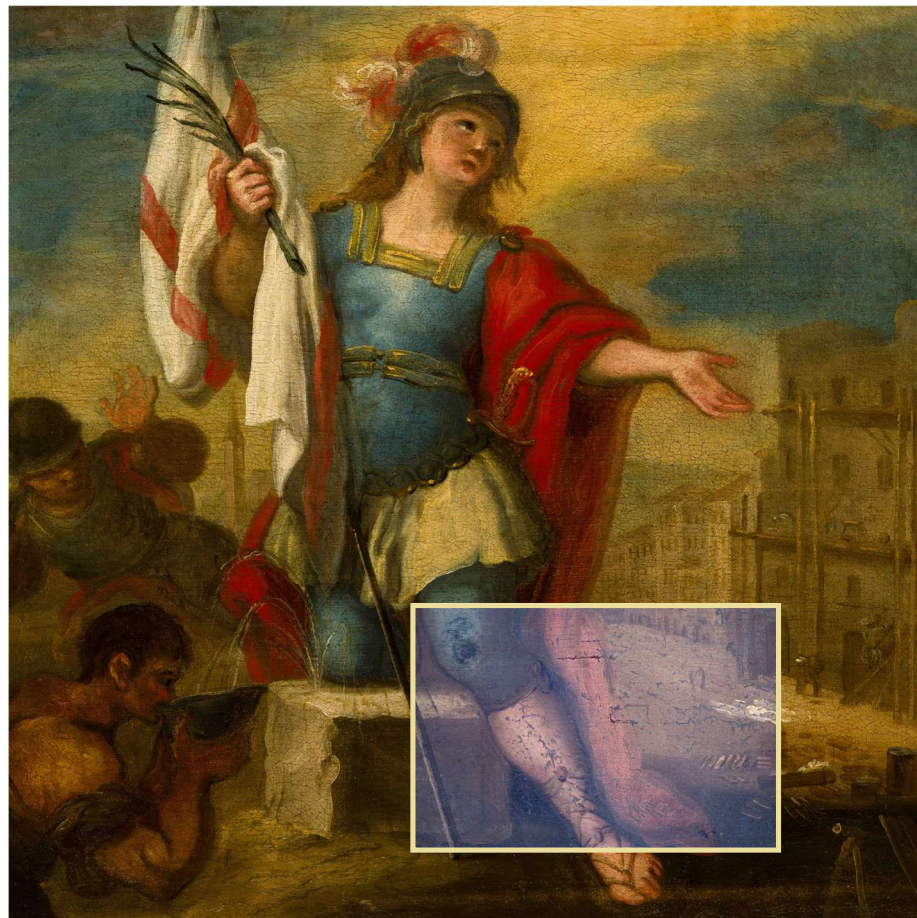
Civic Gallery F. Podesti of Ancona, Sant'Ansano.

Oblique Light acquisition of the entire painting



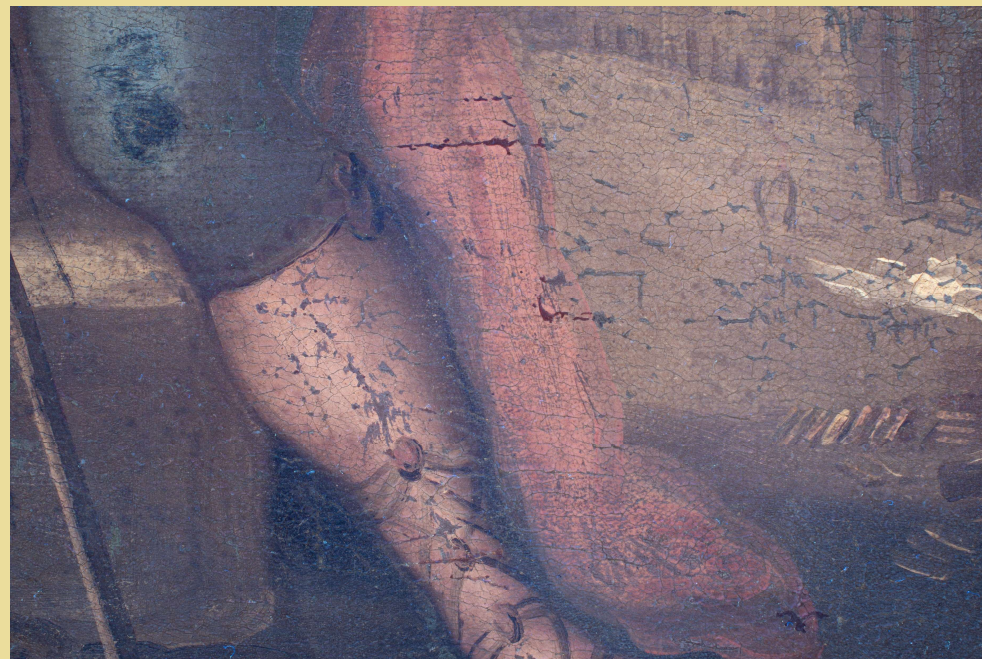
Sant'Ansano Multispectral AR

Multispectral Imaging – UV-Induced Visible Fluorescence



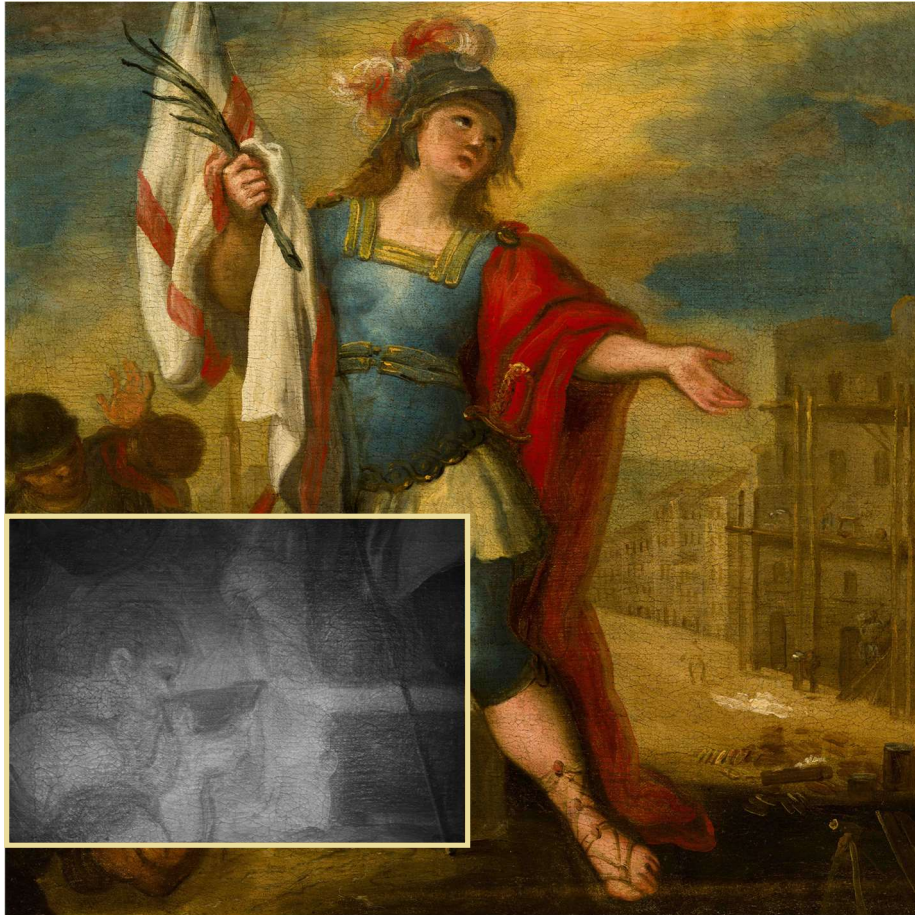
Civic Gallery F. Podesti of Ancona, Sant'Ansano.

UV fluorescence detail overlay with painting



Sant'Ansano Multispectral AR

Multispectral Imaging – IR Reflectography



Pinacoteca civica F.Podesti di Ancona, Sant'Ansano.

Overlay detail of IR reflectography with the painting



Sant'Ansano Multispectral AR

AR Application



SANT'ANSANO

SCHEDA DELL'OPERA

Tipo: dipinto

Tecnica: olio su tela

Autore: sconosciuto

Dimensioni: 95x100 cm

Datazione: 1600-1699

Localizzazione: Pinacoteca Civica F.Podestì Ancona

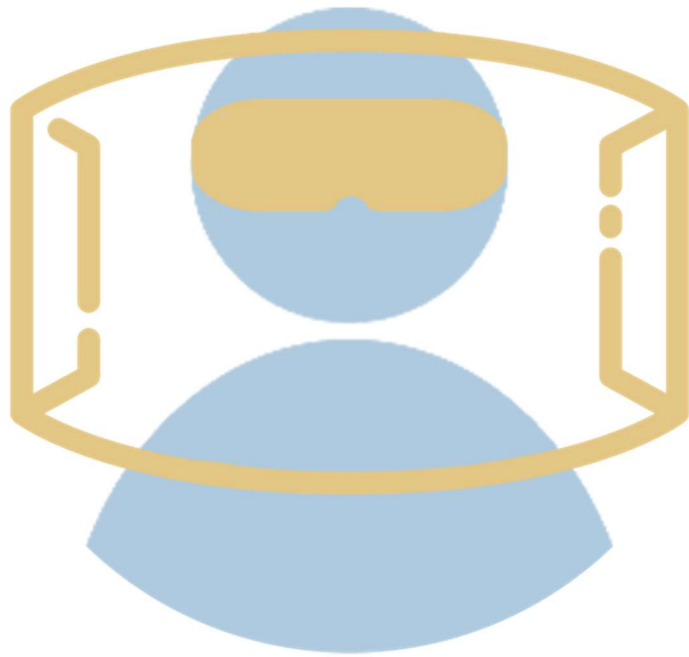
Stato di conservazione: assenza di informazioni

3D **AR**



AR Application





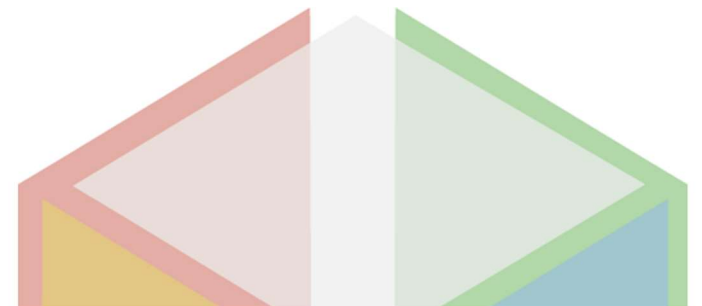
Living LAB on Immersive Experience



**Gigapixel e MBIM
per la Sala Zampetti della Pinacoteca Civica
di Ancona**

Monica Magi

Università Politecnica delle Marche



CASE STUDY



STRUMENTI DIGITALI PER LA GESTIONE E LA VALORIZZAZIONE DI CONTESTI MUSEALI: Gigapixel e MBIM per la Sala Zampetti della Pinacoteca Civica di Ancona

Raccolta dati:

Nuvola
di Punti



Oggetti
3D



Analisi
storico
artistica

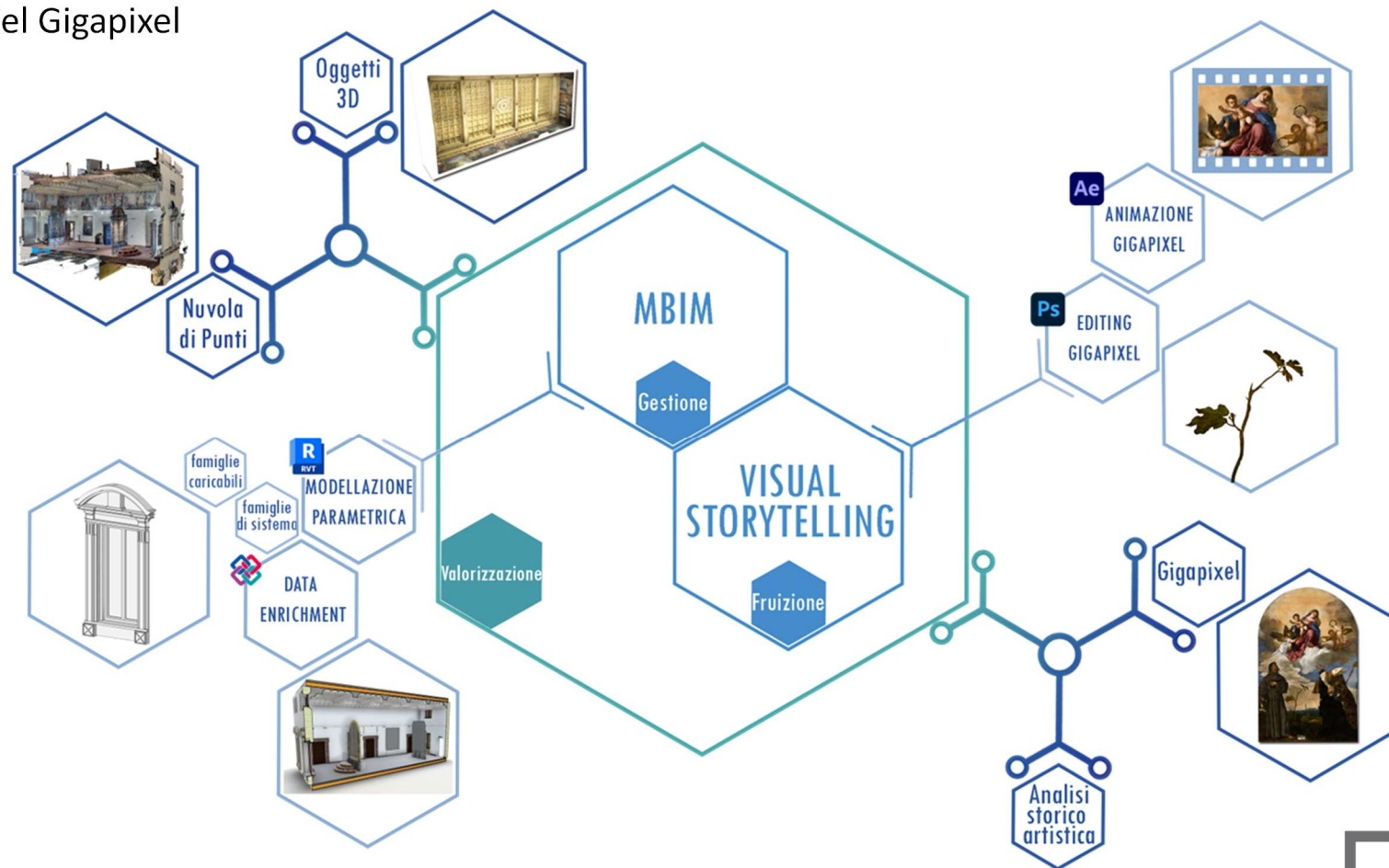


Gigapixel

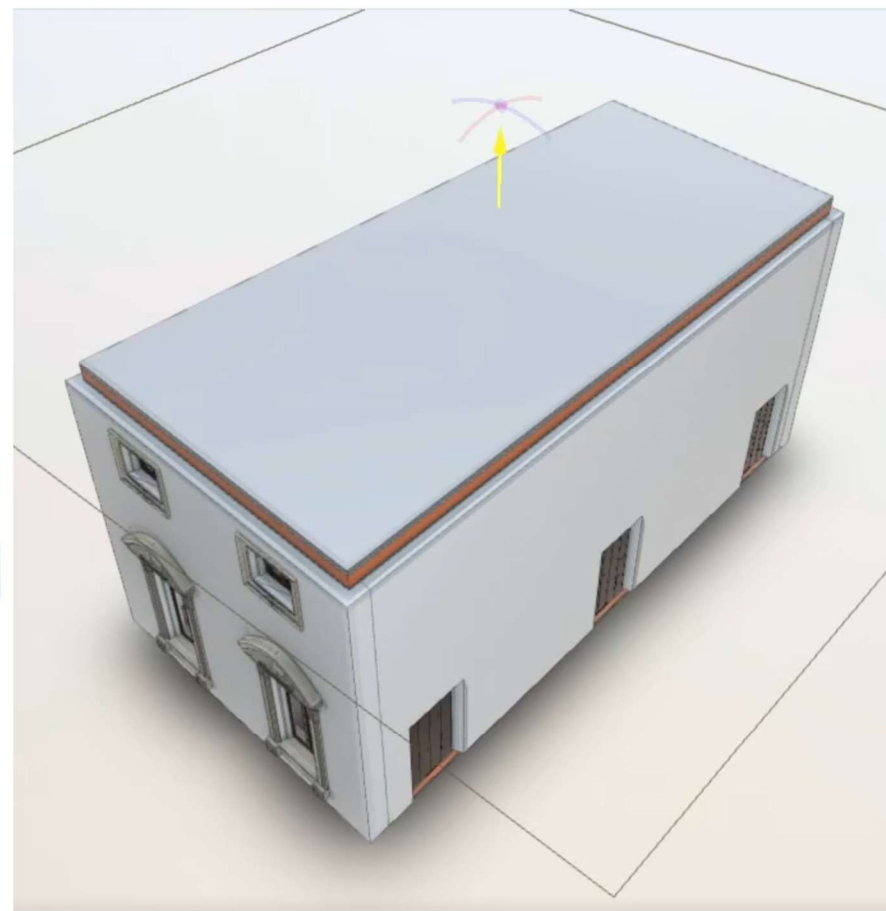
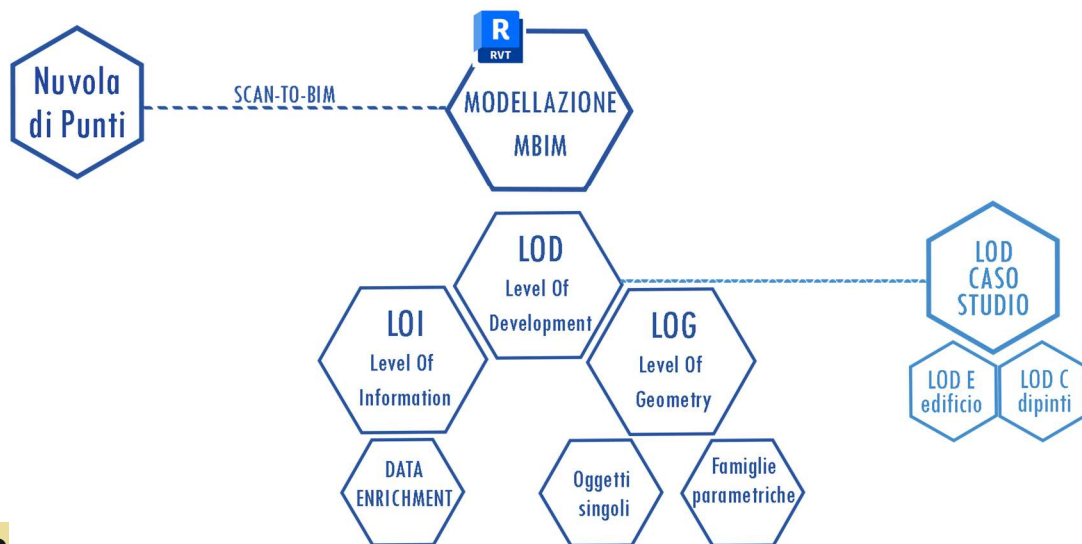


Prototype Aims

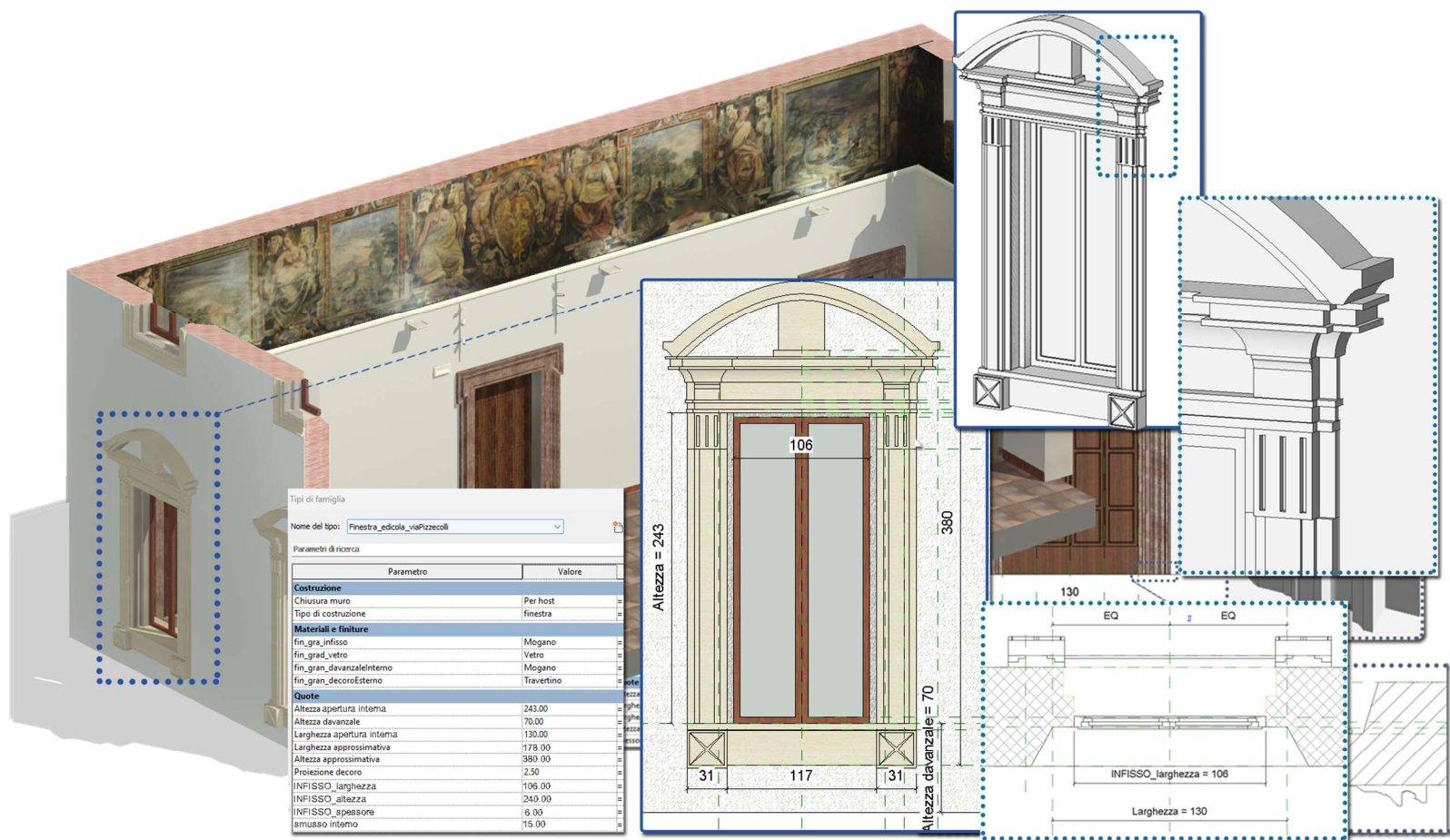
- La modellazione MBIM
- Editing e animazione del Gigapixel



La Modellazione MBIM



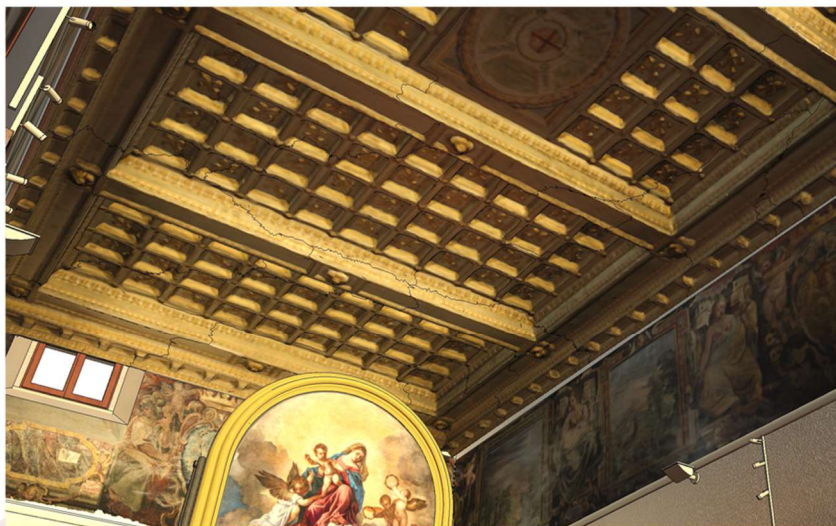
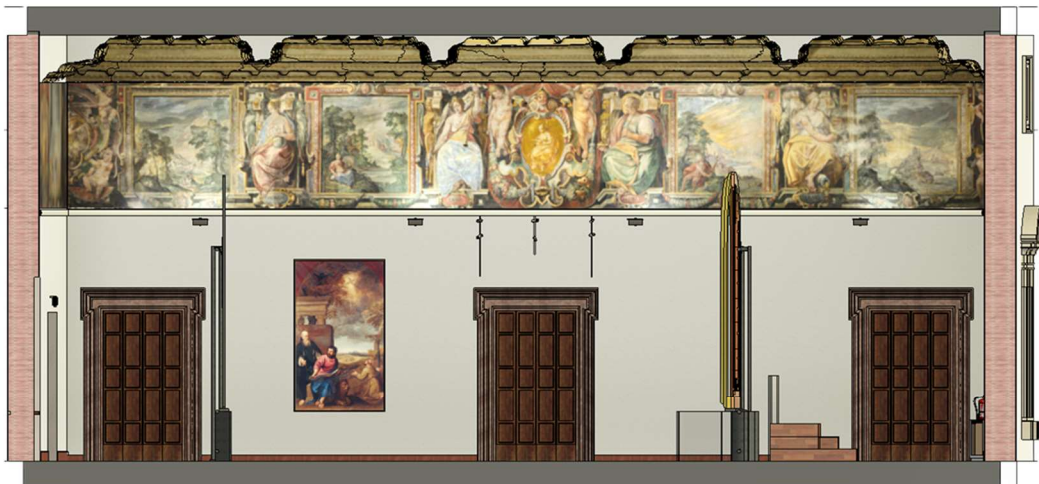
La Modellazione Parametrica



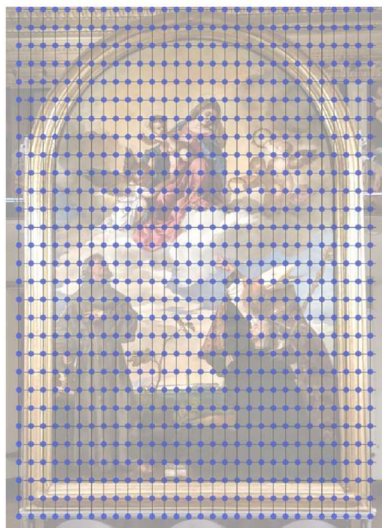
La Modellazione Parametrica



Inserimento OGGETTO 3D



Dal Gigapixel alla Narrazione



CONDIZIONI DI RIPRESA

Dimensioni sensore

Lunghezza sensore 24 mm

Altezza sensore 36 mm

Distanza di presa 0,56 m

Distanza focale 90 mm

Risoluzione scatto

Orizzontale 4000 px

Verticale 6000 px

Ricoprimento

Lunghezza 0,096 m

Altezza 0,144 m

Dimensioni pixel

Larghezza 0,024 mm

Altezza 0,024 mm

CALCOLO DELLE FOTO

Dimensioni della pala

Lunghezza del dipinto 2,15 m

Altezza del dipinto 3,22 m

Sidelap 25%

Overlap 25%

Spostamento

Orizzontale 0,072 m

Verticale 0,108 m

Totale foto nadirali 870

Totale foto oblique -

Totale foto per lato 870

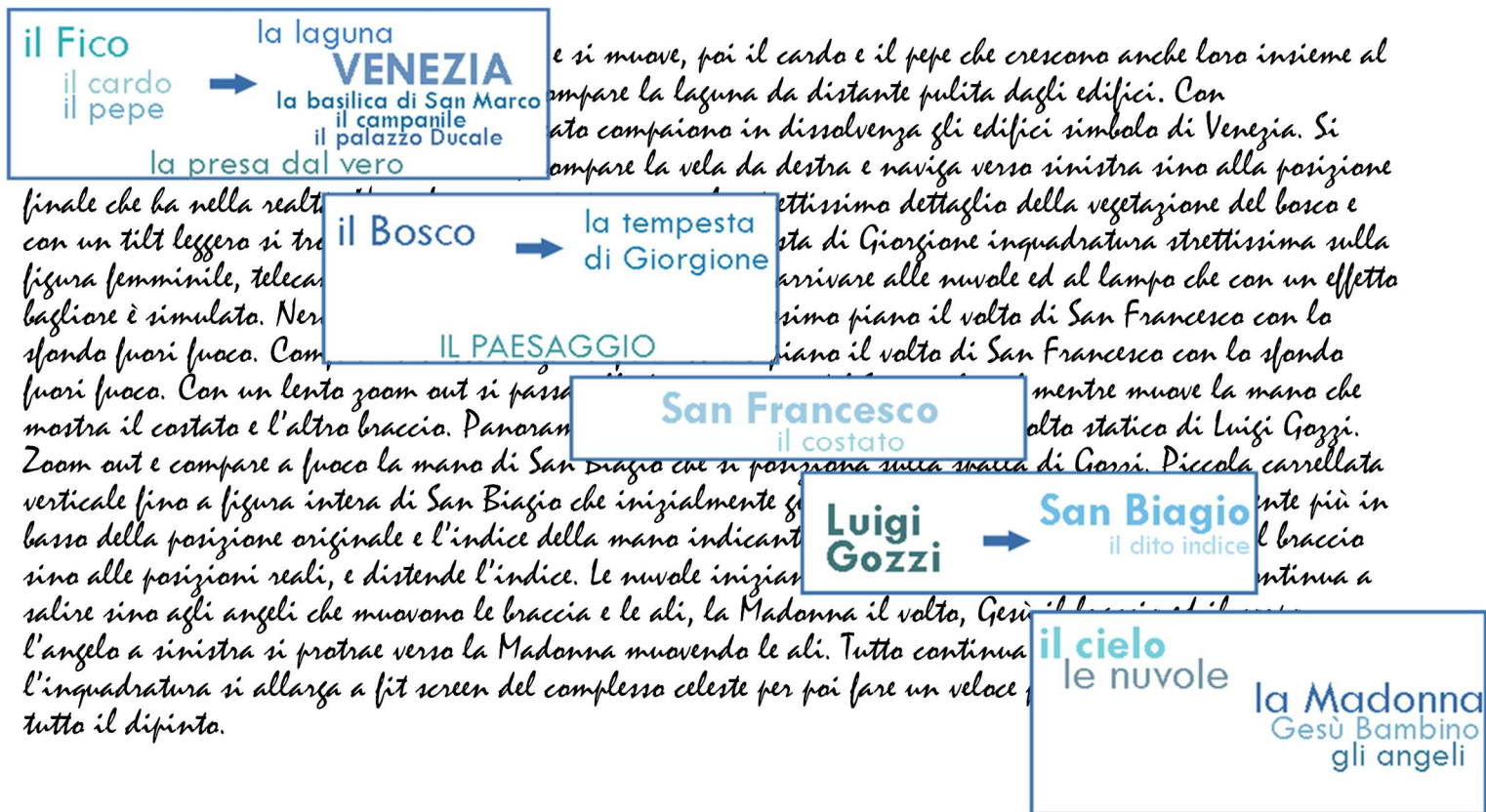
Totale foto 1740



Il concept



Lo storyboard



Editing ed Animazione del Gigapixel

Editing su Photoshop

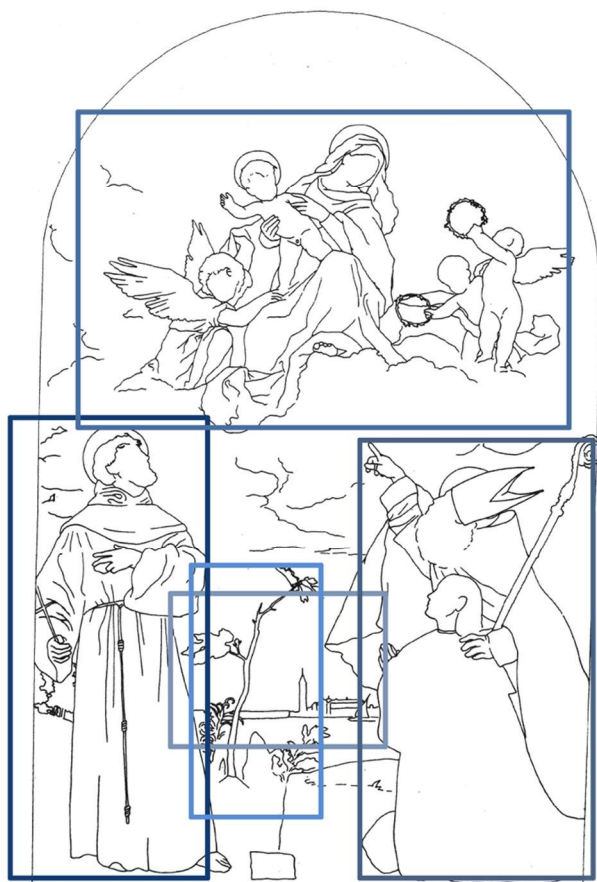
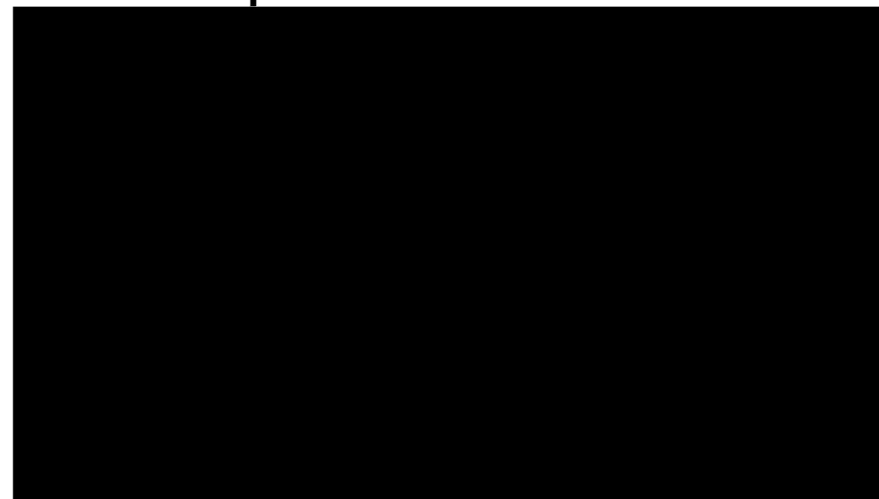
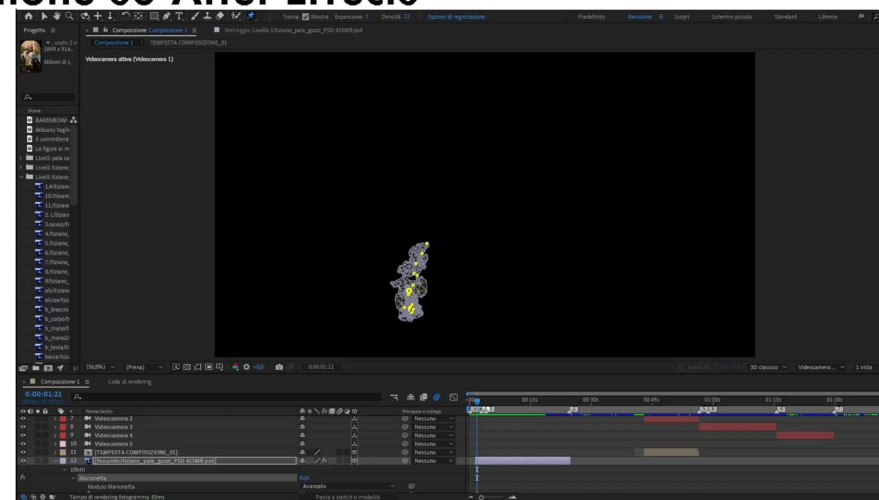


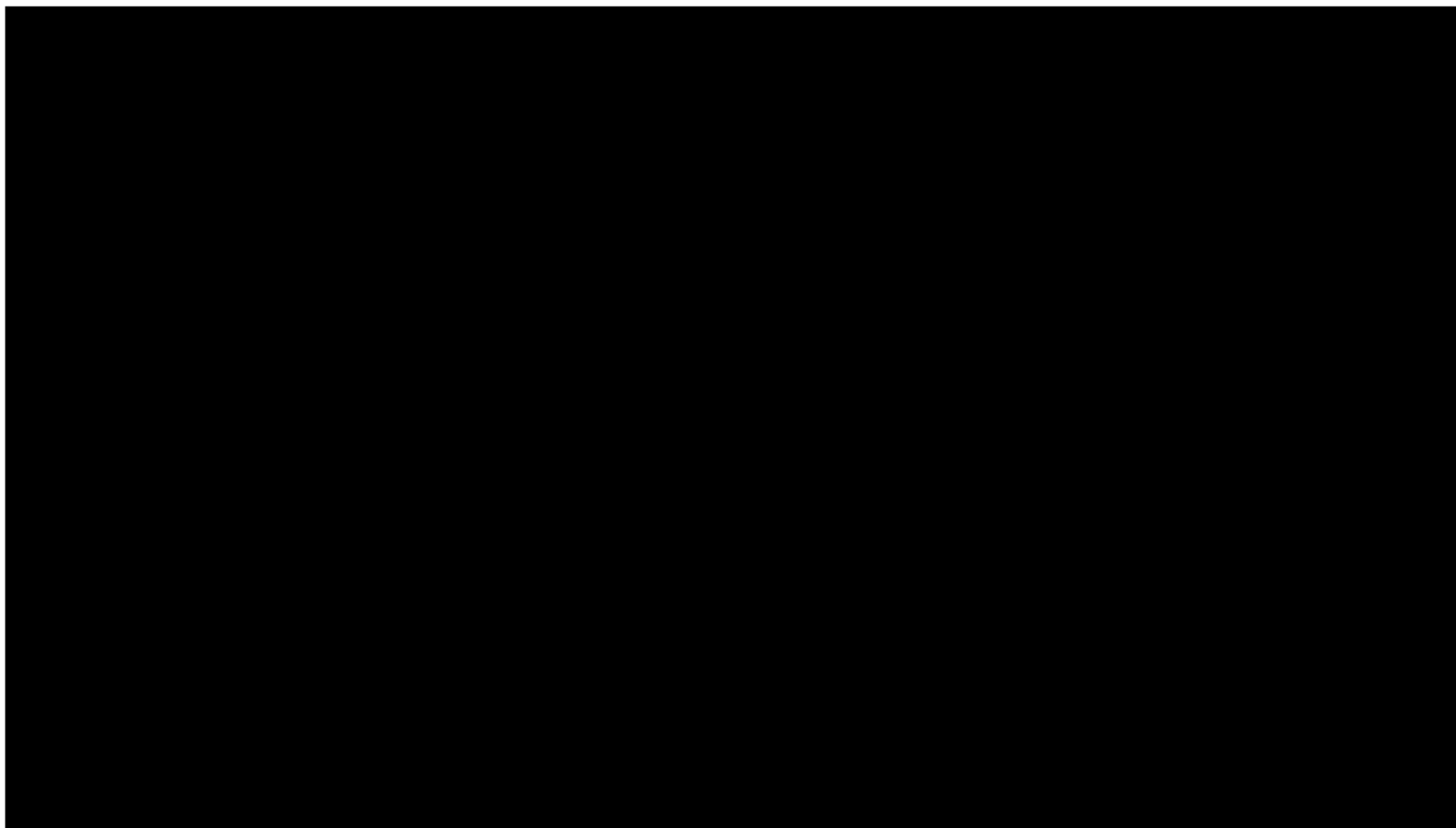
immagine utilizzata:
dimensione 11796 x 18297 pixel
risoluzione di 118,11 pixel/centimetro



Animazione su After Effects



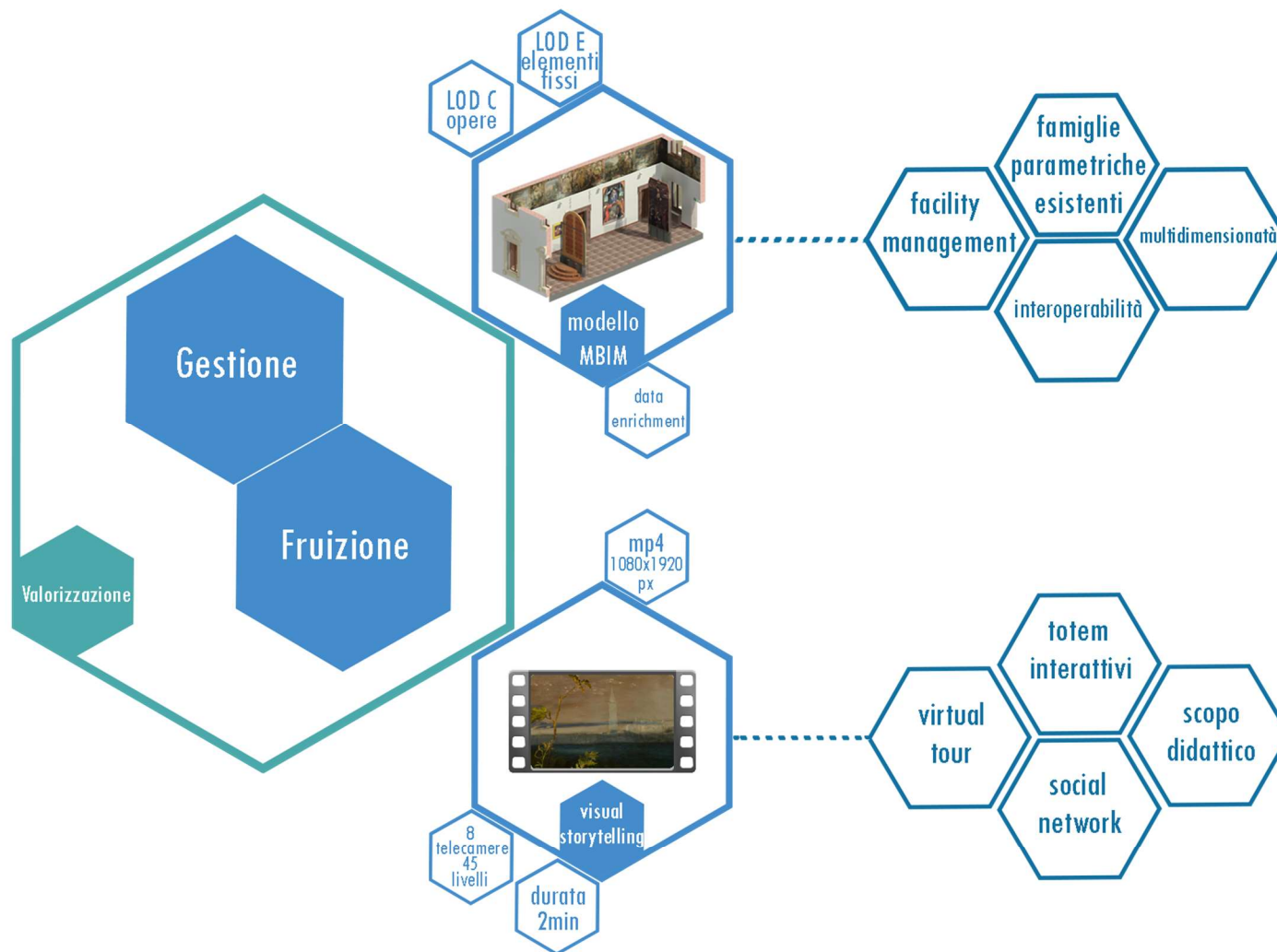
Output Finale: il Visual Storytelling



Musica: Clair de lune, III movimento della Suite Bergamasque per pianoforte scritta da Claude Debussy, suonata da Daniel Barenboim nella sala Philharmonie di Gasteig in Monaco nel 2017



Conclusioni



DC BOX

DIGITAL CURATOR
TRAINING TOOL BOX



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of the European Union



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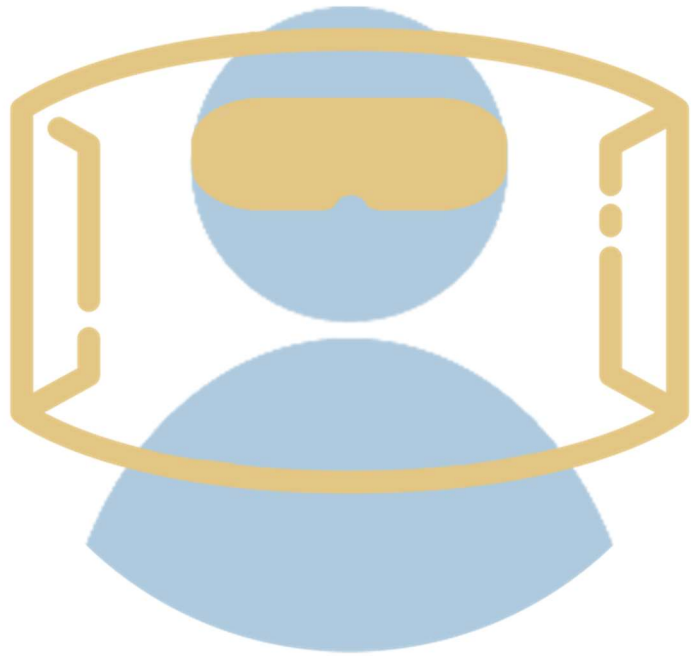


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DC
BOX

RAMONA QUATTRINI
r.quattrini@univpm.it

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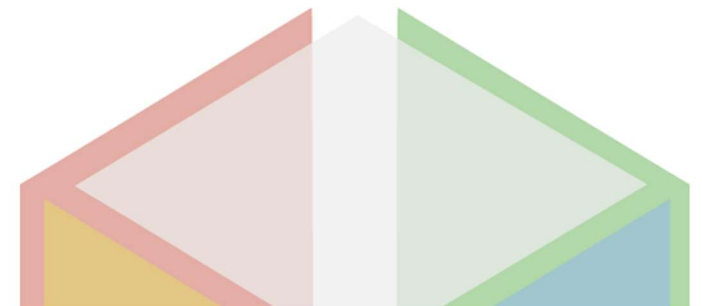
Living LAB
on
Immersive
Experience



**From MuseumBIM to VR
interaction for the Civic Gallery of
Ascoli Piceno**

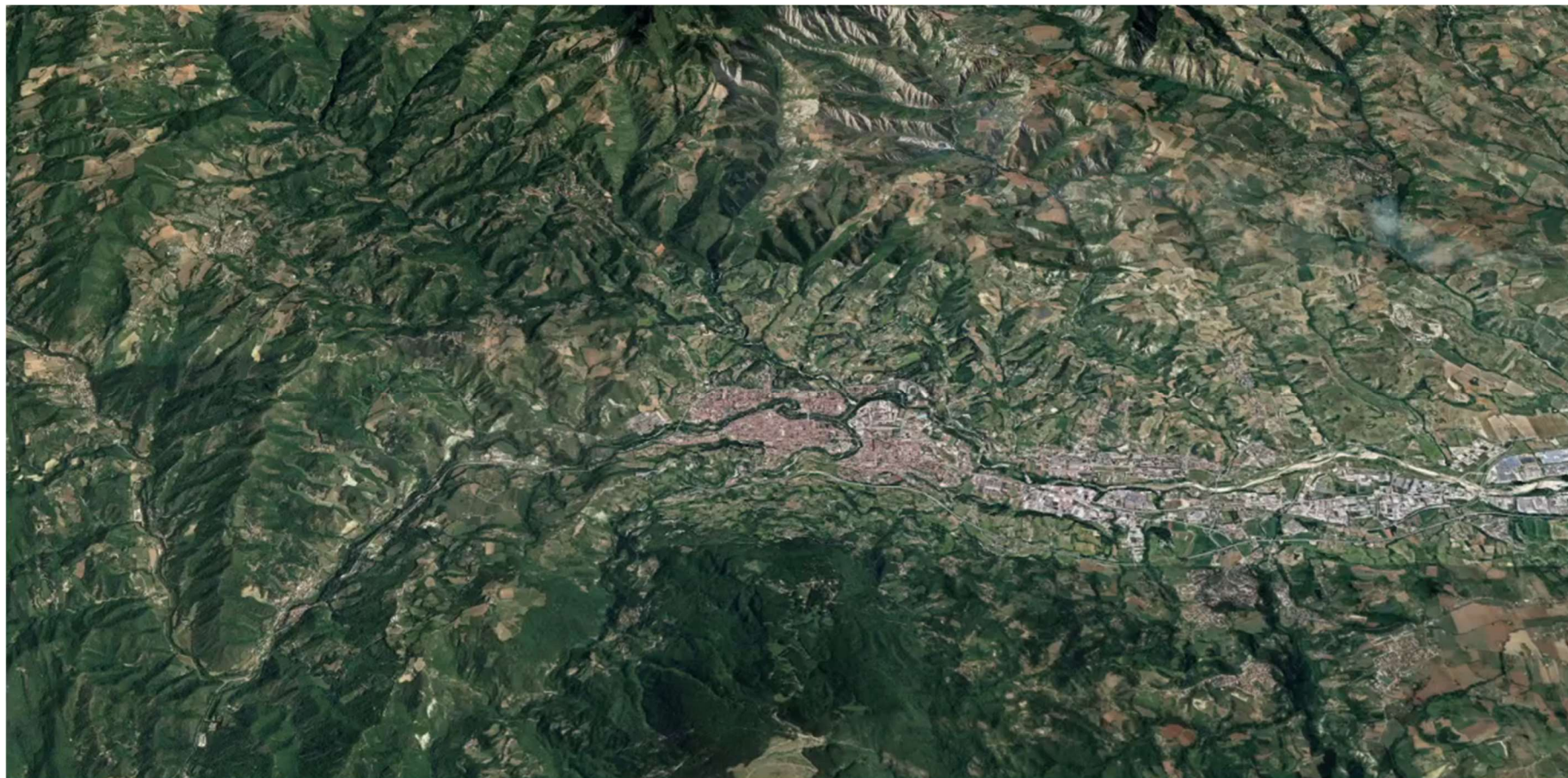
Martina Manfroni

Università Politecnica delle Marche



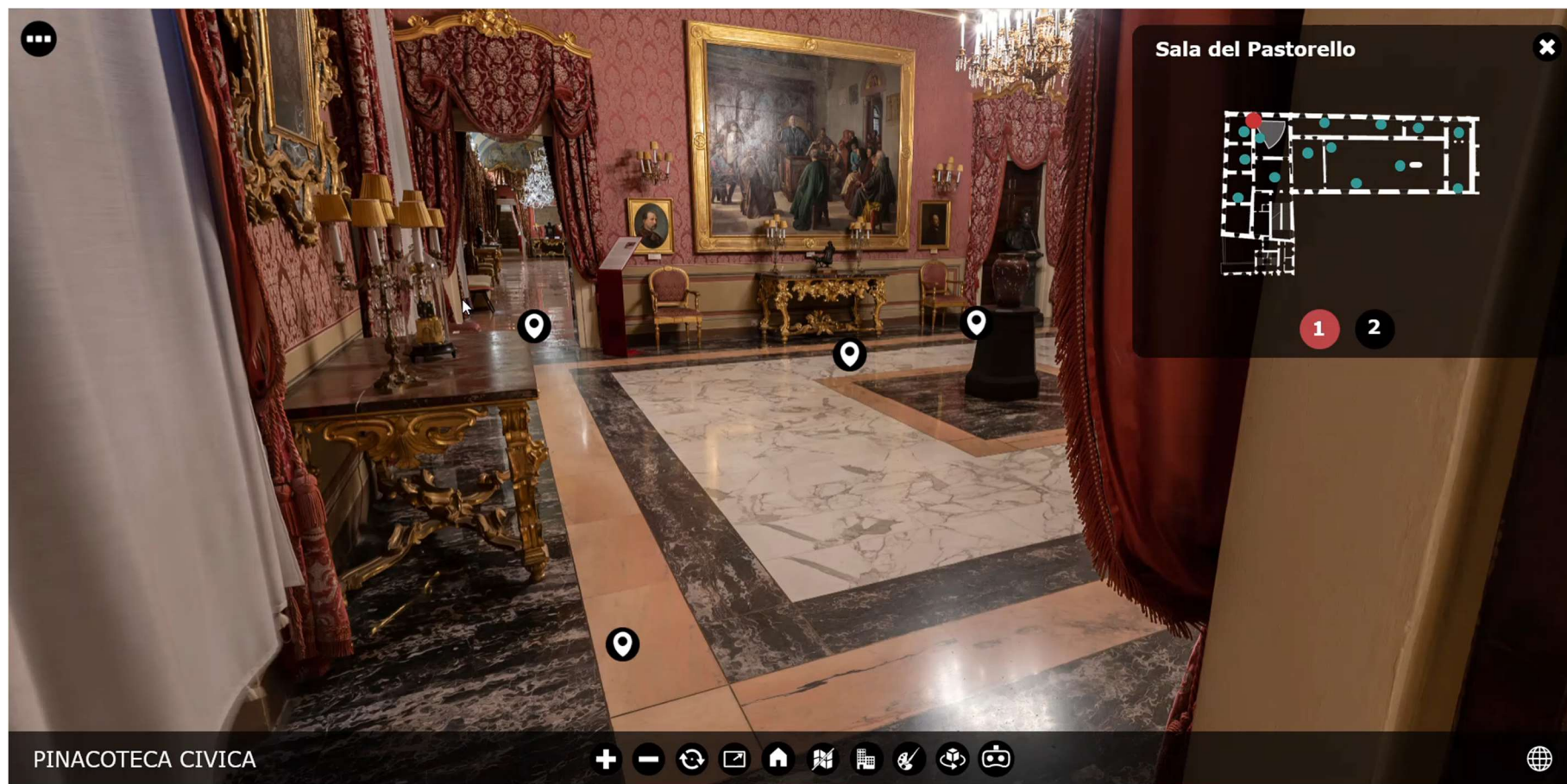
Case Study

Civic Gallery of Ascoli Piceno



Case Study

Pinacoteca Civica di Ascoli Piceno



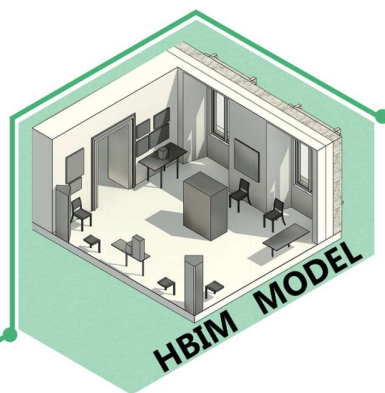
Case Study

Civic Gallery of Ascoli Piceno



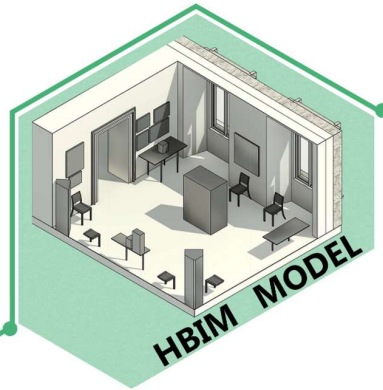
Workflow

Preliminary Step: HBIM Model Construction



Workflow

Preliminary Step: HBIM Model Construction



What is HBIM?



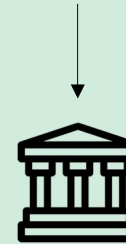
**COMPREHENSIVE
INFORMED MODEL**



**BUILDING
COMPONENTS**



**EXTENSIVE
MANAGEMENT FOR
PRESERVAION**

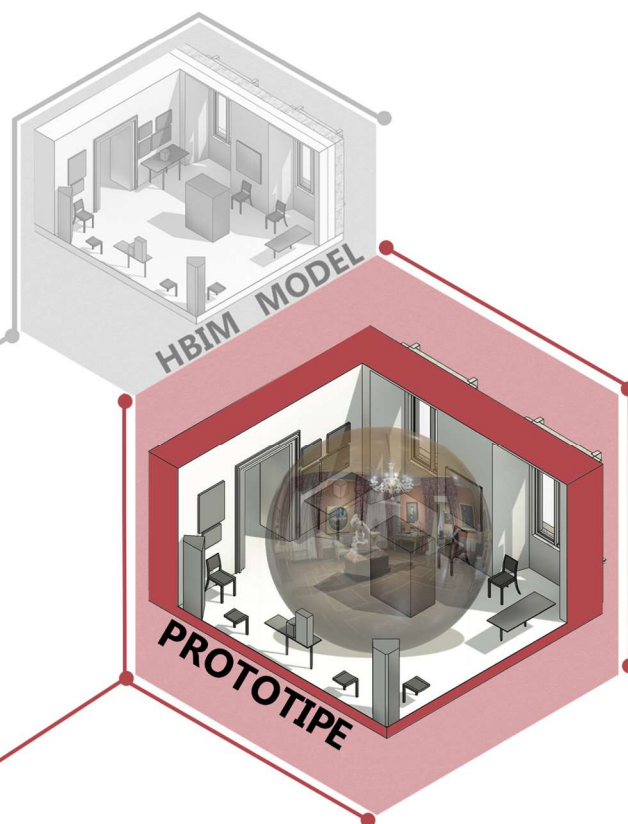


**Heritage Building Information
Modeling (HBIM)**

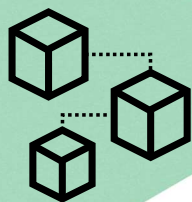
INFORMATION CONTAINER

Workflow

Final Step: HBIM integrated model construction



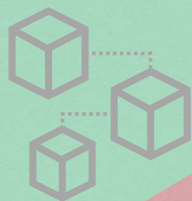
Prototype Aims



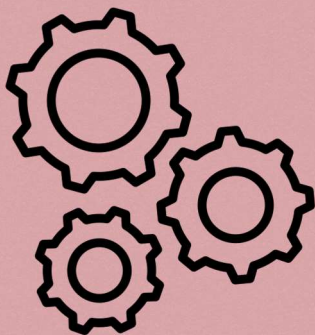
INFORMED MODELING PIPELINE



Prototype Aims



INFORMED MODELING PIPELINE



MODELING PROCESS OPTIMIZATION
through SPHERICAL PANORAMAS



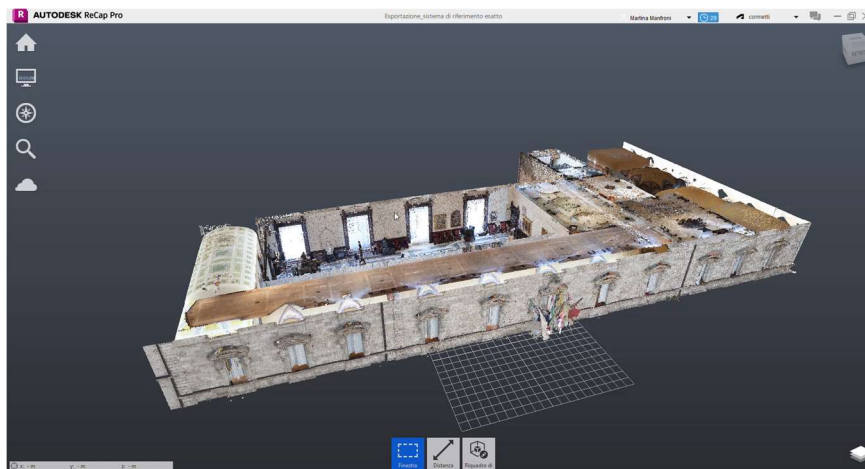
Database

PROGETTO V.I.T.A (Virtua Immersion in Territorial Arts)

Responsible Professors:

- Paolo Clini
- Ramona Quattrini
- E.S. Malinverni

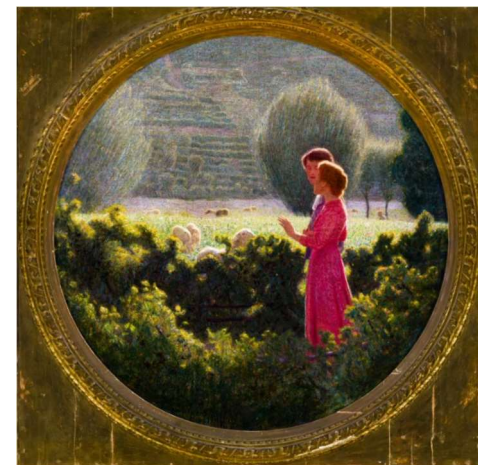
POINT CLOUD



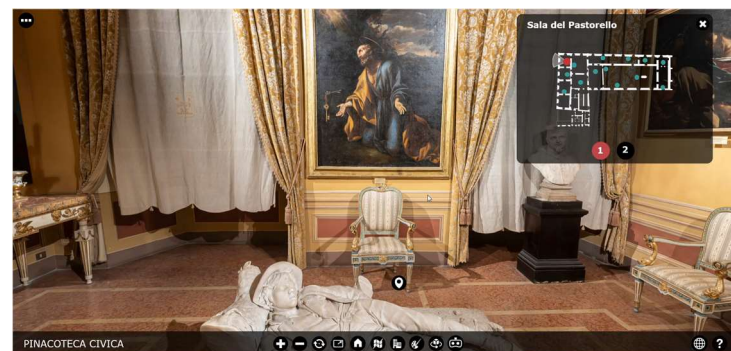
3D MODELS



HD PAINTINGS



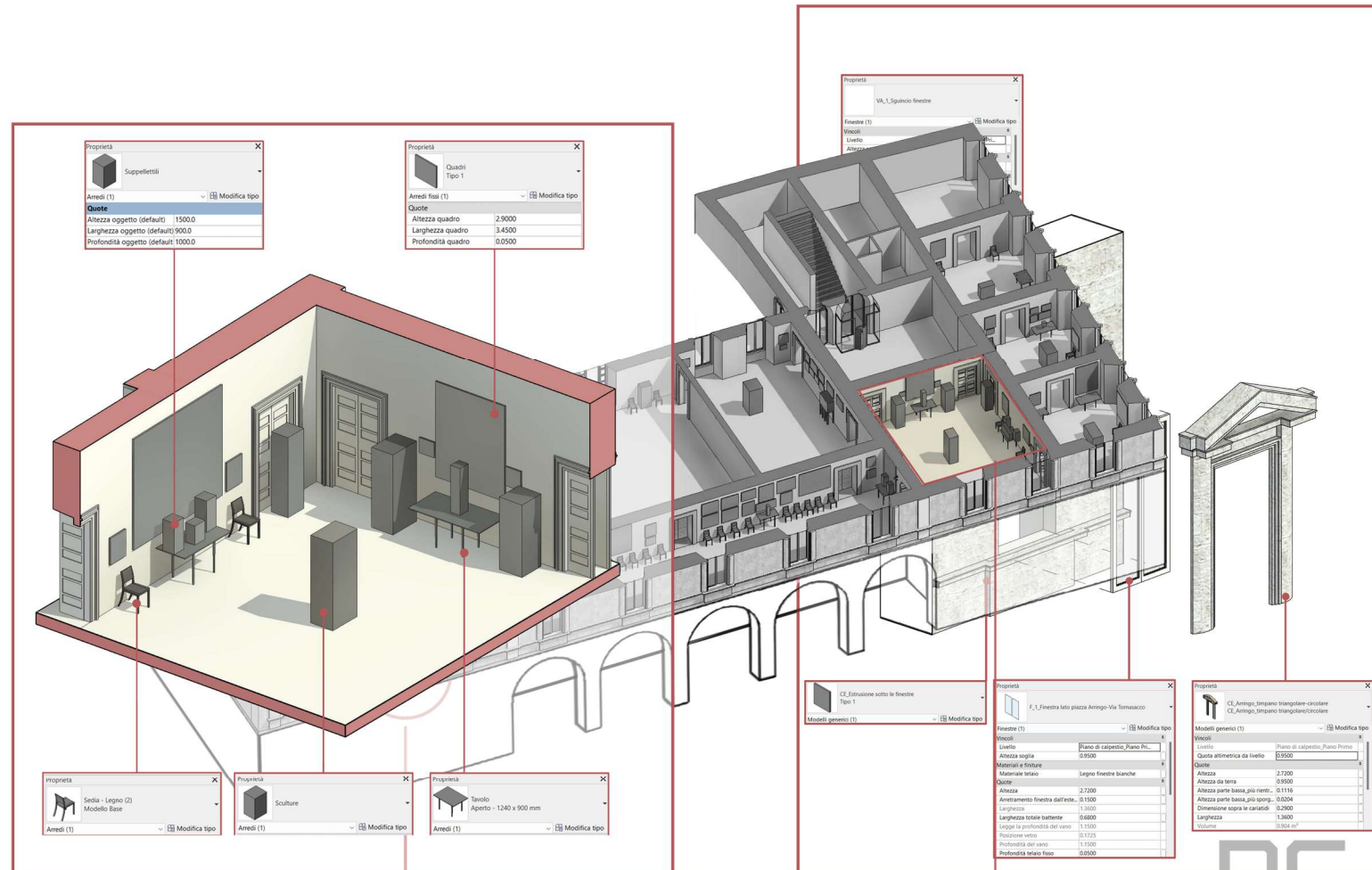
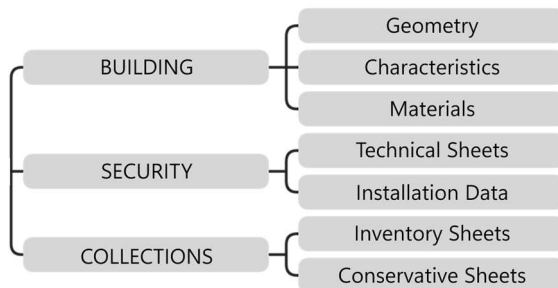
SPHERICAL PANORAMAS



Preliminary Step: HBIM Model Construction

Three Levels:

- Modelling of the **Container** (building)
- Modelling of the **Content** (collection)
- Data Enrichment



Final Step: HBIM integrated model construction



V-ART from BIM[M]

Virtual **A**dvanced **R**esource
management
from **BIM** for **M**useums

Final Step: HBIM integrated model construction

- IFC File Export
- Positioning and alignment of panoramas to the HBIM model
- VR app development in Unity



range_temperatura	19-24	Abaco degli arredi fissi	Id	3EJb8NuJrbpuKDPspvqluO
range_umidità	40-55		Numero di inventari	1100029835
Materia	Tela/Pittura ad olio		Oggetto e datazione	Dipinto,1898-1902
Nome e autore	Pellizza da Volpedo, Passeggiat...		Nome e autore	Pellizza da Volpedo, Passeggiata A
Oggetto e datazione	Dipinto,1898-1902		Collocazione	Sala Fior di Vita
Tipo di acquisizione	Donazione		Materia	Tela/Pittura ad olio
Collocazione	Sala Fior di Vita		dimensioni	1.20 m x 1.15 m x 0.05 m
Dimensioni			Tipo di acquisizione	Donazione
Numero di inventario	1100029835		range_temperatura	19-24
Fotometrica			range_umidità	40-55
Illuminamento	150.00 lx	Illuminamento	150	
Dati				
profondità	0.0500 m			
larghezza	1.1500 m			
altezza	1.2000 m			



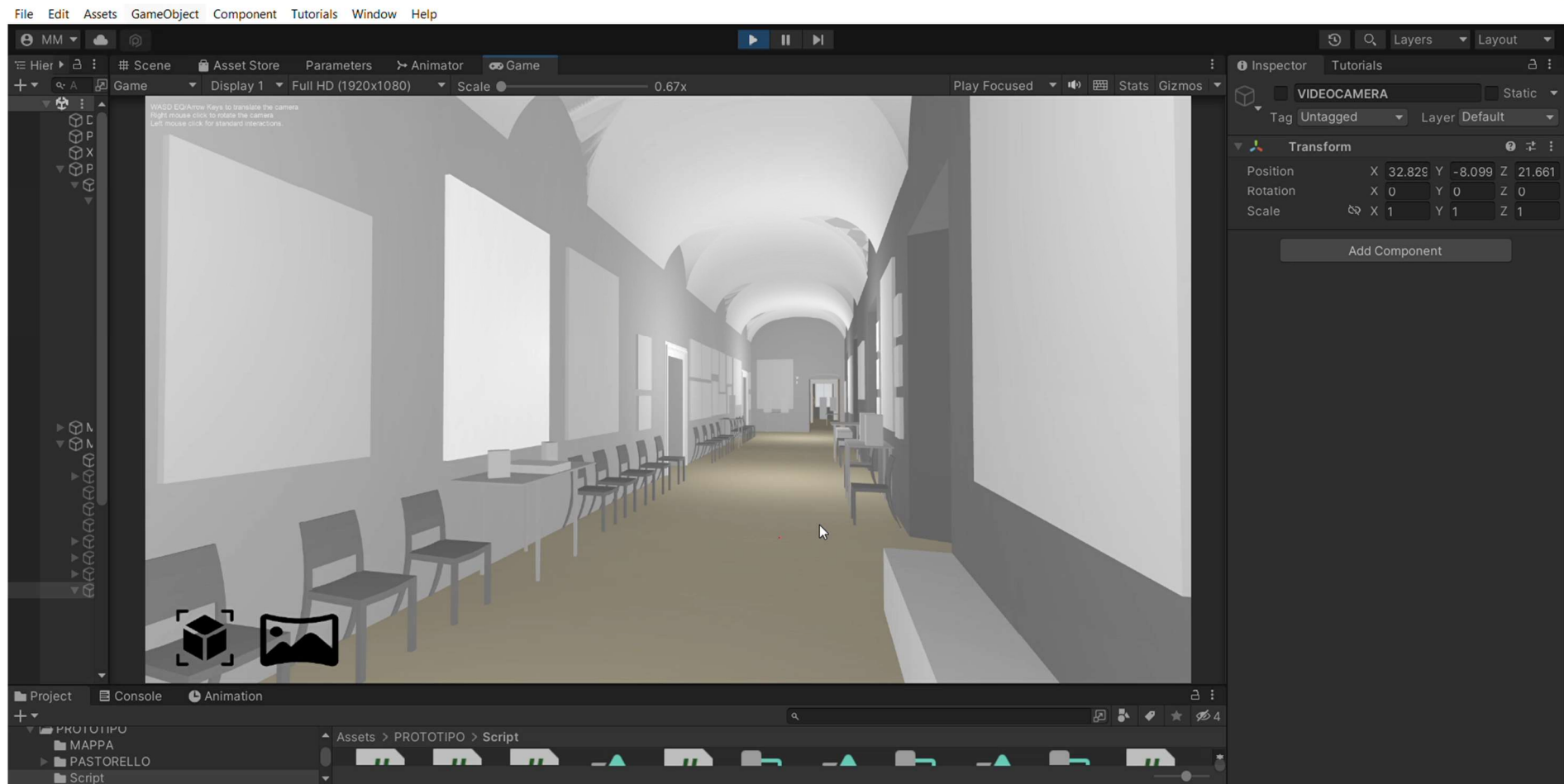
IFC IMPORTER



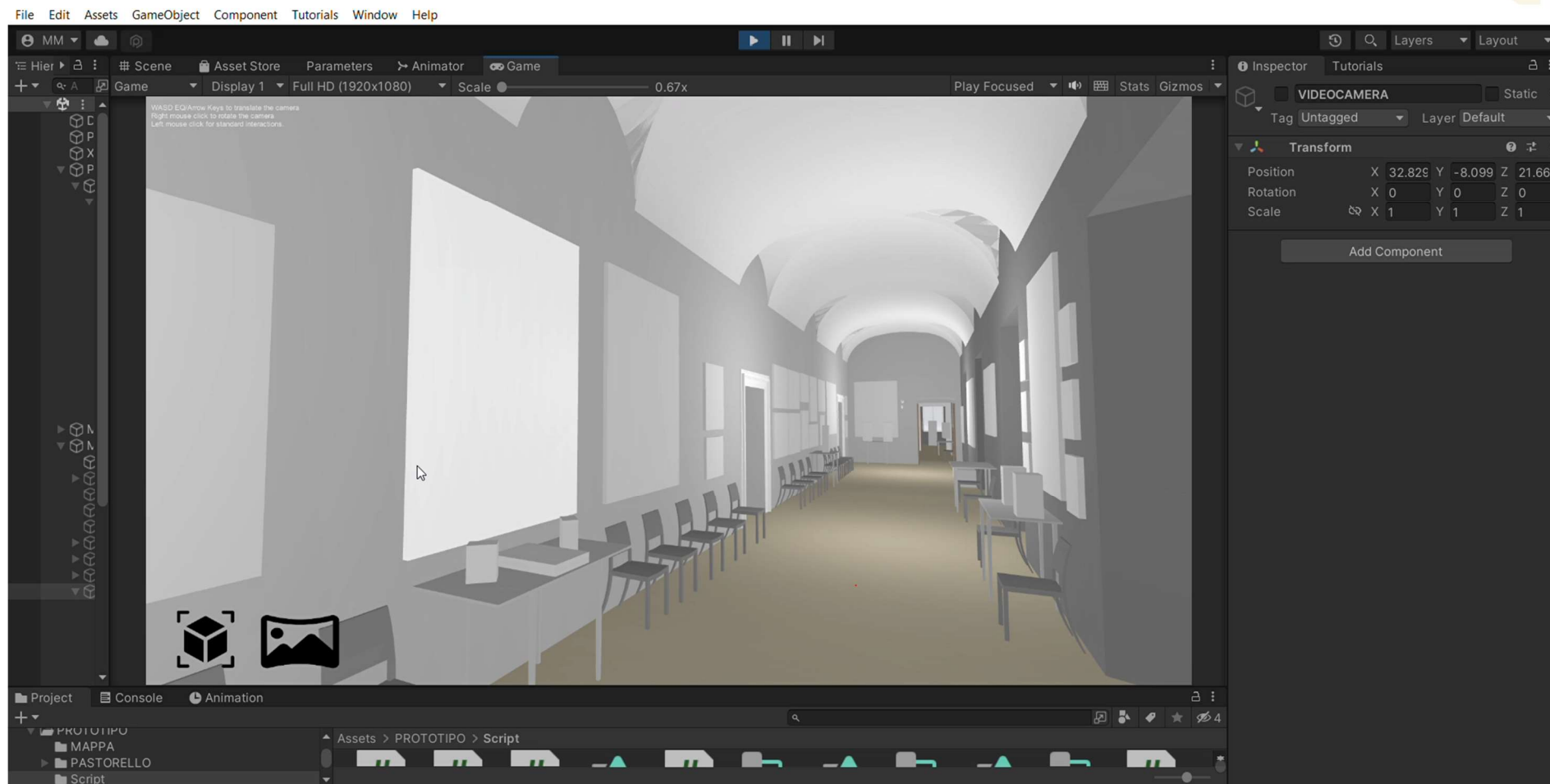
Prototype



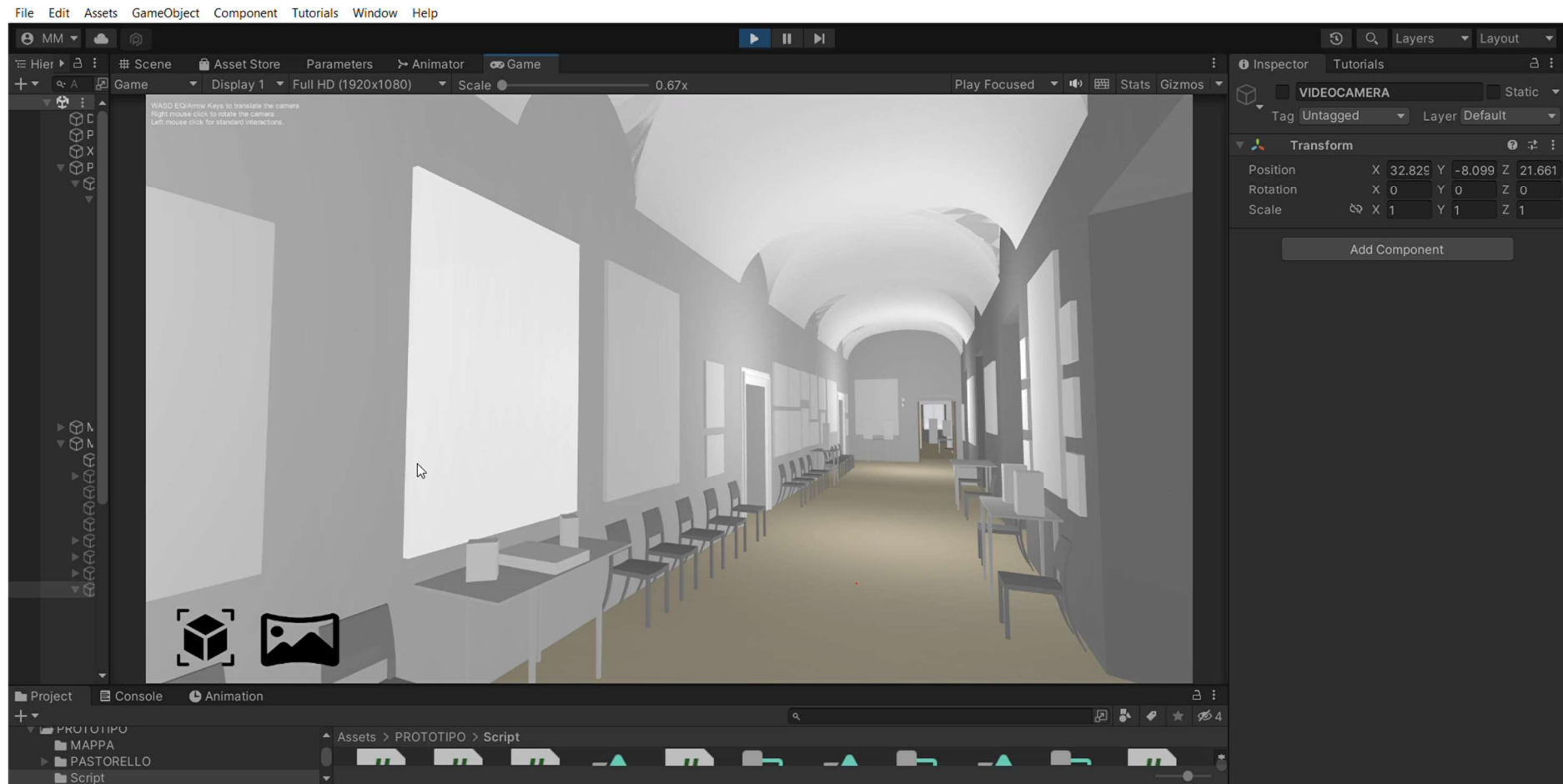
Prototype



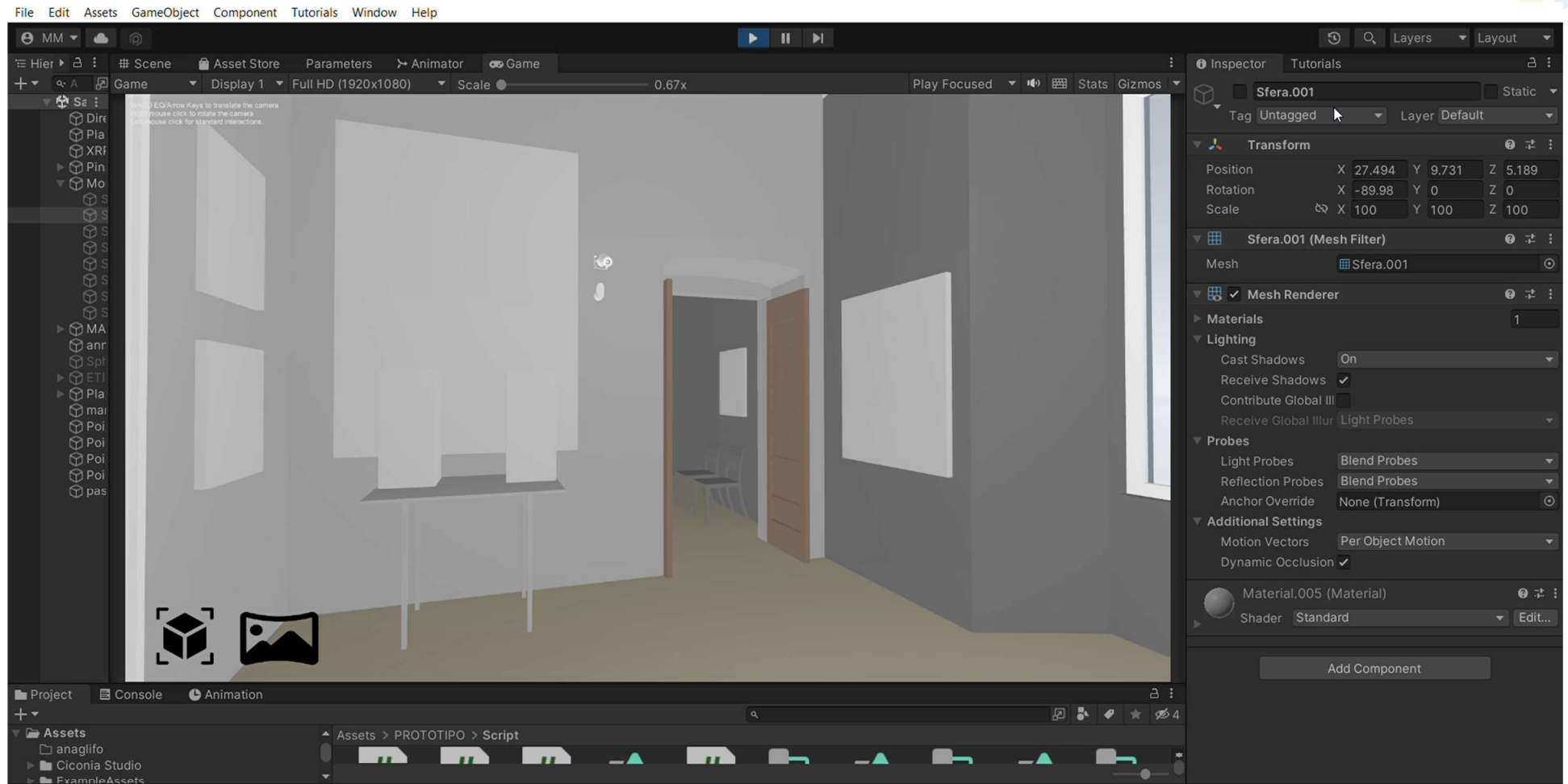
Prototipo



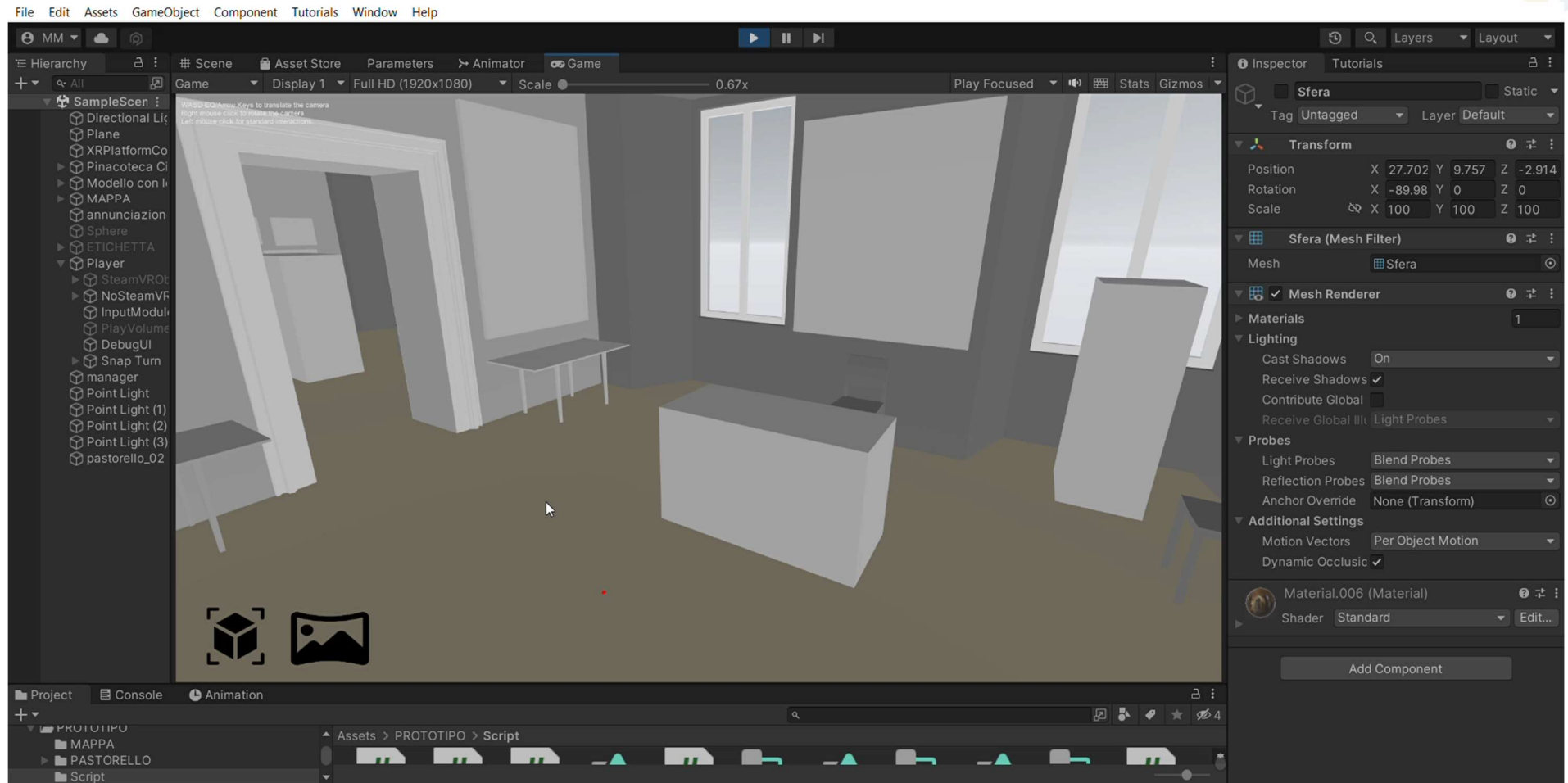
Prototipo



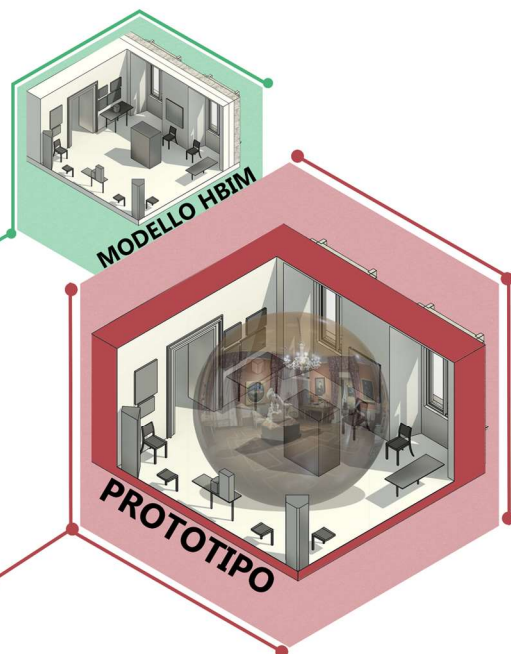
Prototipo



Prototipo



Conclusioni



Modello digitale HBIM, informato, strutturato e accessibile, del Primo Piano della Pinacoteca Civica di Ascoli Piceno

- Riutilizzo di base di dati esistente
- Tempi di realizzazione più brevi
- Risparmio di risorse

Prototipo VR orientato alla gestione dell'edificio e delle collezioni

- Riutilizzo di base di dati esistente
- Flusso di lavoro automatizzato da Revit in Unity
- Interoperabilità tra le diverse figure competenti e professionali

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