



PROGETTO
KATATEXILUX

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cultura e innovazione

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Research Interests

The technology applied to cultural heritage



Introduction

Progetto KatatexiLux is the name under which cultural heritage computer applications are produced by the Associated Architects Studio, Stefano Borghini and Raffaele Carlani. The Studio is particularly interested in IT assisted research, art history and architecture history fields.

KatatexiLux Project was founded in September 2002 and it is the idea of two young graduating architecture students with a shared passion for high technology and computer science applied to the history of architecture. The project name comes from the "crasi" between two terms: on the one hand, the ancient greek katatexitechnos (translated as "he who disperses art in the minutiae") that represents the scientific care and attention to detail present in the studio's projects; on the other hand, the Latin medieval "lux" (inspirational origin of Gothic architecture) emphasizes the emotional and engaging aspect which is the main inspiration that enlivens the Studio's work. Stefano Borghini and Raffaele Carlani's start collaborating while working on the reconstruction of the Virtual Neronis Domus Aurea in 2004, a project which is continuously being updated.

This is the first of a series of official recognitions that takes their work, in a short time, to become known amongst professionals in the field and beyond.

In May 2005, part of the research material was purchased by the RAI (Italian Radio and Television) and transmitted on cultural diffusion programs. A new version of the outdoor spaces of the villa is again produced for RAI in October 2009. Over time, Progetto KatatexiLux dedicates itself to many other works, one which stands out in particular, the movie "Domus Aurea Neronis. Virtual tour of the palace of an emperor" with virtual reconstructions of Nero's palace, carried out for the Rome All Night Festival in 2006; the interactive multimedia project "Virtual Ara Pacis", an ambitious computer oeuvre concerning the monument, commissioned by the Cultural Heritage Department of the City of Rome and currently in the Ara Pacis Museum in Rome; the movie "Domus Aurea 1774" commissioned by the Museo della Fondazione Roma for the exhibition "Rome and the Ancient. Reality and Vision in the 700's" opened in November 2010. In September 2008 for the light show, "The colors of the Ara Pacis," Progetto KatatexiLux studied and rendered the entire restored hypothesis of the original colors of the altar on a philological basis. Noteworthy is the Studio's participation in special events dedicated to new technologies applied to cultural heritage: among these was the exhibition "Imagine Ancient Rome," the first world exhibition of virtual archeology, held in Rome, at Trajan's Market in 2005, or the ArchoVirtual Expo, section of the ninth edition of the Mediterranean Archaeological Tourism Exchange held in Paestum (SA) in November 2006.

History

Since November 2005, the firm has worked in educational support activities, with the chair of Architecture History and Ancient and Medieval Urbanism in the "Valle Giulia" Architecture Department of the University of Rome "La Sapienza". From this moment on, the Studio regularly combines teaching activities and field work, teaching masters and university level courses. In July 2008, the architect Borghini, acquires the title of PhD in Architecture History, and in March of the same year becomes an Adjunct Professor in the "Ludovico Quadroni" Architecture Department of the "La Sapienza" University of Rome. In 2007 the study begins collaborating on numerous projects with the Institute for Applied Technologies in Cultural Heritage of the CNR. From 2009/2010 Borghini and Cariani both become researchers at the same institute.

Since May 2004, the Studio has participated in various research activities, conferences, and national and international meetings relating to the history of architecture, archeology and new technologies, applied to cultural heritage. Talks have been held from Rome to Turin and Berlin to Warsaw at prestigious institutes such as the "La Sapienza" University of Rome, the Regional Authority for Archaeological Heritage of Rome, the Deutsches Archäologisches Institut Rom and the Muzeum Narodowe in Warsaw and for authoritative bodies such as the CAA (Computer Applications and Quantitative Methods in Archaeology) and the FAI (Italian Environment Fund). Over the years, several articles and contributions have been published in conference proceedings and in specialized journals.

Philosophy

L'obiettivo di Progetto KatatexiLux è quello di sfruttare l'informatica in un settore di studi di antica tradizione e di proporre un uso sperimentale della stessa al fine di individuare, oltre ad un efficace approccio alla divulgazione, un interessante ed innovativo strumento di indagine scientifica per lo studio e la ricerca. L'idea portante è che il mezzo informatico possa diventare lo strumento attraverso il quale sia possibile realizzare il sogno che fu di Raffaello: quello della ricostruzione del mondo antico unendo le competenze dello storico a quelle dell'artista, coniugando la ricerca della qualità scientifica, da un lato, alla capacità di emozionare, dall'altro.

Correttezza scientifica e attenzione ai contenuti estetici sono dunque l'esito a cui aspirano questi lavori, che costituiscono solo il risultato finale di scrupolosi processi di ricostruzione, in grado, attraverso una metodologia appositamente studiata, di giustificare ogni singola scelta ricostruttiva.

Non si tratta dunque di apparati iconografici volti alla rappresentazione di un'idea preconcepita dell'architettura antica, ma è di fatto un nuovo modo di condurre la ricerca storico-architettonica: tutti i dati archeologici vengono vagliati con attenzione all'interno della ricostruzione e tutte le ipotesi espresse vengono accuratamente verificate attraverso una simulazione dei fenomeni fisici reali coinvolti nell'architettura

2003
Rendering Ara Pacis

Tridimensional modeling and drafting of the images rendered for the architect Richard Meier's project for the realization of the **Ara Pacis** new museum centre. The goal of the images was to verify beforehand the environmental impact that this work would cause to the urban context of the historical center of Rome. Customer: Sovrintendenza ai beni culturali del comune di Roma (cfr. foto 2)



Ara Pacis

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2003
Rendering cupola
di San Pietro

Realization of tridimensional modeling and drafting of rendered images regarding an hypothesis of a graphic restitution of the construction phases of the San Pieter's dome in Rome, drafted as a graphic support for the conference concerning this subject itself, held at the Theatre Eliseo in Rome by Prof. Alessandro Viscogliosi. The construction phases of the dome have been carefully reconstructed according to the informations gathered from the payment documents that emerged from archival investigations. Customer: **FAI** (Fondo per l'Ambiente Italiano).

2004
Domus Aurea

The collaboration between Stefano Borghini and Raffaele Carlanì takes shape from the virtual reconstruction project of the Domus Aurea Neronis, it started in 2004 but continuously and constantly updated. The project had the dual objective: to rebuild the interior of the pavilion of Colle Oppio (providing them a decorative richness made of marble decorations, frescoes richly colored, precious gems and gold stuccos) and to give the urban layout and landscape of the context. **Ricerca universitaria**

2004
Premio MIMOS

Prize given for the virtual reconstruction project of the Domus Aurea Neronis, obtain by reaching the top four finalists of **MIMOS** prize (Italian Movement for Modeling and Simulation) of Turin, for works related to simulation and virtual reality issues. It is the first in a series of official recognitions, which lead the research on the Domus Aurea to be known by an audience composed not only of insiders.

2005
Superquark

Acquisition of some contents of the virtual reconstruction project of the Domus Aurea Neronis by the RAI (Italian Radio and Television) and broadcasted in the program "Ulisse. Il piacere della scoperta." Customer: **RAI**



Domus Aurea (virtual reconstruction)

2006
Ulisse. Il piacere della scoperta

Making of the film "Domus Aurea Neronis. Un viaggio virtuale nel palazzo di un imperatore" for the event Notte Bianca in Rome. Customer: **MIBAC**



Domus Aurea (virtual reconstruction)

2006
Virtual Ara Pacis

Realization of the museum application "Virtual Ara Pacis". The application uses a touchscreen support placed inside the Ara Pacis Museum by Richard Meier. The application is included in the permanent exhibition of the museum center and is a multimedia archive containing all the historical and artistic informations currently available regarding the monument, upgradeable and fully searchable database of the complete bibliography, as well as a new virtual reproductions of the monument. Customer: **Sovrintendenza ai Beni Culturali del Comune di Roma**

2007
Villa di Livia

Virtual architectural reconstruction of Villa di Livia a Prima Porta. Customer: **CNR-ITABC**

2008
Colori dell'Ara Pacis

Realization of video mapping project "The colors of the Ara Pacis", which proposes a video mapping hypothesis of the original colors of the monument. The color study has been accomplished according to the philological studies of Stefano Borghini, with the contributions of Professor. Alessandro Viscogliosi and dott. Simone Foresta, under the supervision of Dr. Orietta Rossini and prof. Eugenio La Rocca. The digital color work of the monument, already partly realized within the Virtual Ara Pacis project, represents the first chromatic restitution hypothesis of an ancient monument in Rome. Customer: **Sovrintendenza ai Beni Culturali del Comune di Roma**

2009
Superquark

Acquisition by the RAI (Italian Radio and Television) of a new three-dimensional version of the outdoor spaces of Nero's villa, made for the Domus Aurea Neronis project and broadcasted in the "Superquark" programme. Customer: **RAI**

2010
Domus Aurea 1774

Making of the film "Domus Aurea 1774" for the exhibition Roma e l'Antico. Realtà e visione nel 700 (Roma); Customer: **Fondazione Roma.**

2010
Domus di Torre Bruciata

Realization of multimedia equipment for the Archaeological Museum of Teramo. The project took place in an interactive installation inside the museum that offers a three-dimensional restitution of the so-called Domus di Largo S. Anna (or di Torre Bruciata). Customer: **CNR-ITABC.**

2011
Matera

Tridimensional reconstruction of Matera's city and its landscape. The contents have been used to create a mobile application called "Matera, città narrata". The geological and urban reconstruction of Matera provides the morphological conformation of the main historical phases of the city. Customer: **CNR-ITABC**.

2011
Etruscanning

Involvement in the project "Etruscanning" developed by CNR-ITABC, for which Katatexilux was commissioned to reconstruct the famous Regolini-Galassi tomb in Cerveteri and the objects that have been found inside. Several techniques have been used to detect the objects many: 3D laser scanner, computer photogrammetry, ecc. Customer: **CNR-ITABC**

2011
Nerone

Realization of the media path for the exhibition "Nero." The project includes four videos: "Roma Domus Fiet. La casa d'oro di Nerone", "Domus Transitoria Neronis", "L'incendio del 64 d.C.", "Domus Aurea. Restitutio Memoriae". Customer: **Electa/Mondadori**

2011
Diis Manibus

Realization of interactive and multimedia equipment for the musealization of archaeological excavation of Santa Rosa and Autoparco. The project includes the application "Diis Manibus" and the video "Diis Manibus. La necropoli Vaticana sulla via Triumphalis". The application employs 11 PC all-in-one touchscreen located along the boardwalk, set up for the site visit, and provides the user the opportunity to visit the excavation underlying, walking among the columbaria and the tombs displayed in 3D view. On the other hand the movie shows the history and the issues of the site, explaining the historical phases that compose the complex mosaic of the archaeological remains visible nowadays. Customer: **Musei Vaticani**.

2011-2012
Ricerca Universitaria

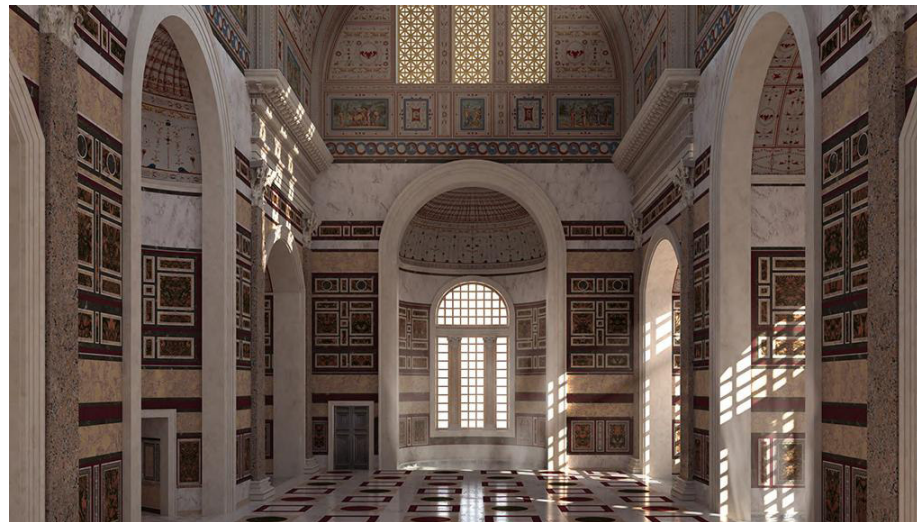
Participation in the research conducted by the Faculty of Architecture of the University of Rome La Sapienza, entitled "Rebuilding the interior Templars to rethink Greek architecture". Customer: **Sapienza, Università di Roma.**

2012
Villa dei Volusii

Historical and architectural research and tridimensional reconstruction Villa dei Volusii in Lucus Feroniae, for the Museo Virtuale della Valle del Tevere project. Customer: **CNR-ITABC**

2012-2013
Terme di Traiano

Tridimensional reconstruction of Trajan Baths, according to a new archeological reading of the existing remains and the documentary sources. The reconstructive interpretation concerned the spatial and volumetric aspects but also the surface coating materials and aspects related to the role of the water and the light in the thermal spaces. The model created will be implemented within an interactive multimedia application that allows you to virtually visit the areas of the baths. Customer: **Sovrintendenza ai Beni Culturali del Comune di Roma**



Terme di Traiano (virtual reconstruction)

2013
L'ordine e la Luce

Stefano Borghini and Raffaele Cariani are curators of the exhibition "L'Ordine e la Luce" hosted in the Fruttiere of Palazzo Te in Mantova. The aim of the exhibition is to offer a journey through time and space linking Palazzo Te with entire history of ancient architecture. The rooms have been virtually reconstructed, combining the natural interaction systems to the projections over wide surfaces. Through this technology the user had the feeling of moving inside the space just moving his body. The exhibition has been entirely designed and built by Project Katatexilux and it accomplished more than 90,000 entries during the five months it took place. Customer: **Centro Internazionale di Arte e Cultura di Palazzo Te.**



L'Ordine e la Luce

2014
Santo Stefano Rotondo

Realization of tridimensional reconstruction of Santo Stefano Rotondo. The project includes the volumetric reconstruction of the building and the graphic restitution of its decorations. **Ricerca Universitaria**

2014
Museo Palatino

Multimedia exhibition of the new Palatine Museum. The aiming of the project is to tell, through the virtual reconstruction of architecture and landscapes, the history of the Palatine from the first huts to the imperial palaces. The exhibition includes several teaching devices located all along the path of the old Antiquario. The materials includes a video, a video wall, a video mapping work and four bidimensional panels that tell the various historical phases of the Palatine. Customer **Electa Mondadori**

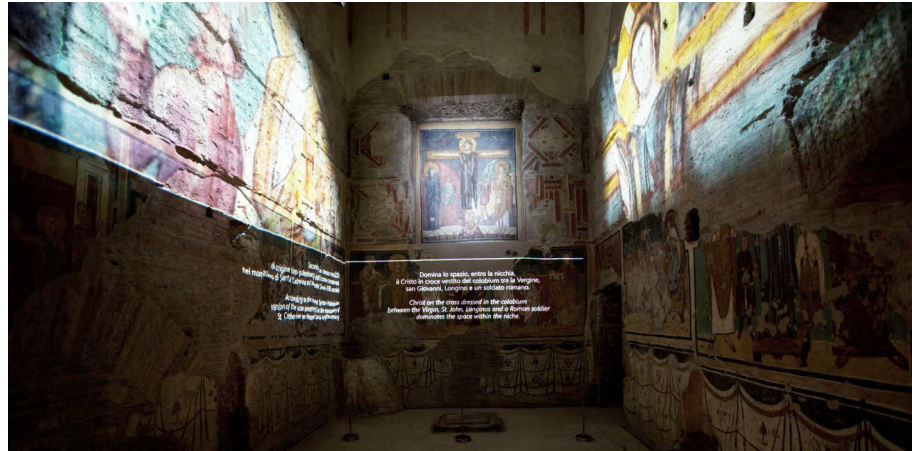
2014
Ghetto Ebraico

Realization of the virtual reconstruction of the entire Jewish Ghetto in Rome, disappeared after the demolitions of 1888. The reconstruction can be consulted through an application installed on an interactive table become part of the permanent architectural layout of the museum. The interactive table, wanted by the Museum, returns this way the lost image of a portion of Rome in the late nineteenth century, constituting at the same time an opportunity for deepening knowledge of Roman Jewish community and its history. Customer: **Jewish Museum of Rome**



Ghetto Ebraico (Interactive table)

- 2014
National Geographic
- Publication of the work "Domus Aurea" by the magazine NATIONAL GEOGRAPHIC INTERNATIONAL. One of the reconstructive images was used as cover of the magazine on September 2014. Customer: **National Geographic**
- 2014
Le Figaro
- Publication of the magazine "LE FIGARO HORS-SÉRIE" of part of the work on the Domus Aurea, available in the section called "Rome Secrete". Customer: **Le Figaro**
- 2015
Terme di Egnazia
- Realization of the table application entitled "Le Terme di Egnazia". Through the suggested path, the user has the opportunity to visit the archaeological site, comparing directly the current status of the remains with the tridimensional reconstruction of the baths. Customer: **CNR-ITABC**
- 2015
Museo della Protostoria
- Multimedia exhibition of Section Protohistoric in the National Roman Museum. The work includes the video "Protostoria dei Popoli Latini" and a video mapping work about one of the objects found during the archaeological excavations and now visible in the museum. Customer: **Soprintendenza speciale per il Colosseo, il MNR e l'area archeologica di Roma.**
- 2015
Sinagoga di Ostia Antica
- Extension of multimedia architectural layout in the Jewish Museum of Rome with the creation of the movie "La Sinagoga di Ostia Antica". The work is based on the virtual reconstruction of the architecture and the decorative elements of the oldest synagogue in Western Europe of which are preserved archaeological evidence. Customer: **Jewish Museum of Rome**
- 2016
Santa Maria Antiqua
- Realization of a multimedia path for the "Santa Maria Antiqua. Tra Roma e Bisanzio", set for the extraordinary reopening of the church Santa Maria Antiqua, in the Roman Forum. The project's goal is to guide visitors in the reading of the building's history and and his paintings in an emotional journey, scientifically reliable. Through video mapping, used for the first time in the Roman Forum the missing parts of the frescos of the two chapels on the sides of the presbytery are re-proposed in an immersive way. The project also includes the realization of the three videos, "Prima di Santa Maria Antiqua", "Santa Maria Antiqua", "Santa Maria Antiqua. Universi tra Roma e Bisanzio", which tell the history of the church through the narration of its historical phases, paintings and restorations. Customer: **Electa Mondadori**



Santa Maria Antiqua (video mapping)

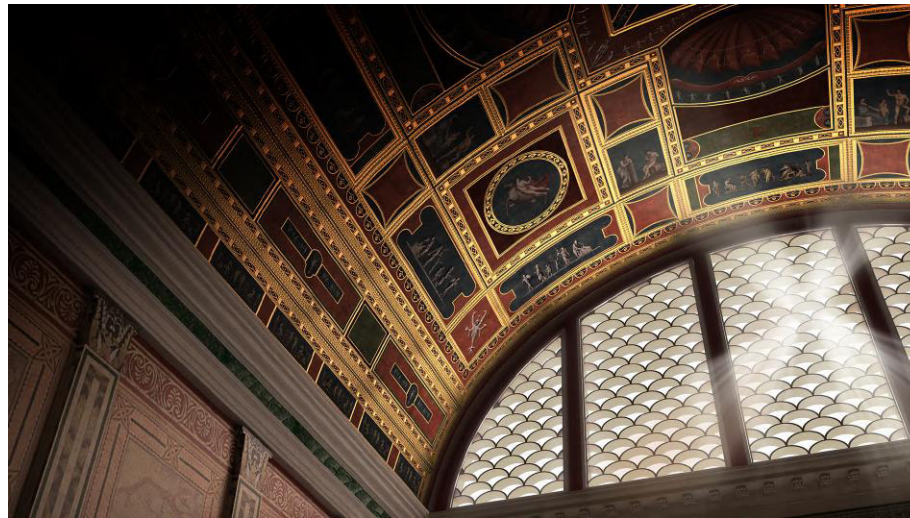
2016
Neros Goldenes Haus

Realization of the multimedia layout in the Archaeological Museum in Trier, Germany. The project includes the video "Neros Goldenes Haus", the video "Der Brand von Rom" and a bidimensional panel. Customer: **Museo Archeologico di Treviri**

2017
Domus Aurea Neronis

Realization of a media path, at the Domus Aurea in Rome. The interventions are aimed at broadening the enjoyment by the public through the use of multimedia installations using technologies, such as videomapping on large surfaces and virtual reality. The two proposed interventions are developed along the path of the twelve-step guided tour of the Domus Aurea site. The final effect is a real journey through the time, a whole new experience in the world of technology applied to cultural heritage. The scientific development project is promoted by the Superintendence for the Colosseum and the central archaeological area of Rome with Electa.

2017
**La via tra il Colosseo e
il Foro Romano**



Domus Aurea Neronis (Virtual Reconstruction)

Collaboration with the archaeologist and university professor Emanuele Brienza in the preparation of the book " Valle del Colosseo e pendici nord orientali del Palatino, la via tra valle e Foro: dal dato stratigrafico alla narrazione virtuale (64 d.C - 138 d.C.)" , published by Edizioni Quasar. "This book is the result of my activities as an archaeologist of the excavations carried out at the Meta Sudans and the NE Pendici of the Palatine, which began in 1991 and is still in progress .." (Emanuele Brienza)



The scientific research and update are constantly improved attending events regarding specifically new technologies applied to cultural heritage: among all, the "Immaginare Roma antica" exposition, first virtual archeology world exhibition that took place in the "Mercati di Traiano" in Rome in 2005, or the ArcheoVirtual exposition, part of the IX edition of "Borsa Mediterranea del Turismo Archeologico", held in Paestum (SA) in November 2006.

Since the 2005 the Studio collaborate, as didactic support, with the chair of Storia dell'architettura e dell'urbanistica antica e medioevale of the Valle Giulia Architecture Department of Sapienza University. The academic attendance and supervision of graduation thesis about virtual reconstruction design are conducted as well as frequent lessons and training courses for the university.

Progetto KatatexiLux took part in several national and international conferences and conventions about history of architecture, archeology and new technologies applied to cultural heritage: from Rome to Turin, Berlin and Warsaw, the meetings take place in renowned institutes as Sapienza University of Rome, the "Soprintendenza Speciale per i Beni Archeologici di Roma", the "Deutsches Archäologisches Institut Rome" or the "Muzeum Narodowe" of Warsaw, or for authoritative institutions such as the CAA (Computer Applications and Quantitative Methods in Archaeology) or the FAI (Funds for the Italian Ambient). Through the years several articles and contributions have been published on convention acts and scientific periodicals.