

Research Group

Knowledge, valorisation, and digital communication of cultural heritage

Reference year:

2025

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Description of research lines:

The research group, by a transdisciplinary nature, carries out a critical reflection on architecture, on the city, on the environment (material and intangible) and on industrial design, investigating disciplinary sources and cultural trends with attention to the themes of knowledge, shape, structure, innovation, representation, enhancement, and communication. In this sense, in relation to cultural heritage, the main research themes activated by the members of the group concern:

knowledge;
 safety;
 enhancement;
 communication

Knowledge: in this line of research, studies will be activated which find in the architectural and environmental survey at different scalar dimensions and for different operational and management purposes, a multiple tool of investigation through direct and indirect methodologies the photogrammetric one, from the drone survey to the use of the laser scanner, to the computer modeling aimed at interoperability (H-BIM). The investigations conducted through the graphic analysis of the real (existing and / or planned), the geometric-configurative analysis of the architectural space, the analysis of iconographic documentary sources also belong to this line of research.

Enhancement: in this line of research, systemic studies will be activated aimed at enhancing the architectural and environmental heritage through processes identified in the context of cultural planning. In a synergistic way, the themes of enhancement and use will find correspondence in actions that experiment with new forms of access to knowledge as well as interaction, capable of qualifying environments in 'ecosystems of knowledge'. The enhancement actions may include event projects, sensory staging strategies (through the use of multimedia devices, augmented reality and setting up immersive environments), strategies for representing architecture and the environment (through the use of traditional tools visualization graphics and modeling implemented with the potential offered by virtual environments), processing in the form of visual data of information contents of databases and big data platforms.

Communication: in compliance with the new notion of 'accessibility to culture' typical of the knowledge society and in the opinion that the planning dimension of knowledge and communication also includes the experimentation of new forms of access to knowledge through personal experience, interaction and the emotional involvement of the users themselves, in this line of research, studies of a design nature will be activated aimed at defining communication strategies and hypotheses of narration of heritage, capable of identifying and strengthening its 'perceived value'. Both through the more traditional languages of visual communication and the most innovative multimedia forms of digital dissemination, the projects may include communication artifacts, AI experimentations for digital storytelling, exhibition itineraries, performances, video installations, pop up stores, editorial products, short films, aimed at the construction of a cross narrative media and dedicated to widespread users such as cultural tourism and/or ethical and public utility communication.

Relationships with other research groups of the University of Campania L. Vanvitelli during the last three years:

Acoustics, Vibration and multisensory Interactions -ACOUVI Advanced materials laboratory
Energy Efficiency & Environment - E3
Gems and Jewels: History and Design
Organic design, on the synthesis of the form, a group as manifesto
SENS i-Lab Laboratory
Structural and sEismiC safety of strategic and relevant existing constrUctions buildings and bRidgEs
Sustainable Industrial Design - SIDE
The Memory of Sites. History and Preservation for promoting the environmental and architectonical heritage (MemoS)

Participation in research projects during the last three years:

Title of the project: GESTioNE del rischio SISmico per la valorizzazione turistica dei centri storici dei Mezzogiorno – GENESIS (codice progetto ARS01_00883)

Scientific coordinator: Prof. Enrico Spacone, Università degli Studi di Chieti-Pescara

Program title: Avviso del 13/07/2017 "Presentazione di progetti di ricerca industriale e sviluppo sperimentale nelle 12 aree di Specializzazione individuate dal PNR 2015-2020"

Abstract: The main objectives of the research concern the development of a computer platform for the collection of information on the historical-cultural heritage, aimed at the simulation of damage scenarios for the management of emergency situations (territorial scale); at the planning of

interventions for the reduction of seismic risk (urban scale); at the development of structural behavior models for the evaluation of static safety and seismic vulnerability as well as the interventions that may be necessary according to the previous analysis (building scale).

Involved Staff: Gianfranco De Matteis

Partner institutions: Proposed by Università degli Studi G. D'Annunzio di Chieti.

Academic Partners: Università degli Studi della Campania Luigi Vanvitelli, Università degli Studi dell'Aquila, Università degli Studi della Basilicata, Università degli Studi Mediterranea di Reggio Calabria, Università degli Studi di Enna Kore, Università Iuav di Venezia, Università degli Studi di Bergamo, Università di Pisa

Industrial Partners: Tab Consulting S.r.l. TAB Consulting, Asdea S.r.l. ASDEA, Zugaro Guido & C. S.r.l., Target Euro S.r.l., Kibernetes S.r.l., FIP Industriale S.P.A., PRO.GE.77 S.r.l., SISIA S.r.l. SISIA, BOVIAR S.r.l., Consorzio C.i.p.a.e. A R.l., BASF S.r.l., TELENIA S.r.l., Etna Hitech S.c.P.A., Fibre Net S.r.l.

Status: Funded

Submission date/Start/End of the project: 09-11-2017/01-01-2023/30-06-2025.

Project title: Inaccessible religious architecture. A workflow of knowledge, 'expanded' usability and 'inclusive' accessibility (EX-IN_AccessIBILITY)

Scientific coordinator: Vincenzo Cirillo

Responsible for Research Units: Antonella di Luggo (Unina), Alessandra Lardo (UniParthenope)

Call title: PRIN 2022

Abstract: The project proposes to investigate the religious architectural heritage of the city of Naples (Italy) to transform the condition of inaccessibility of some assets into a renewed accessibility, with the preparation of 'expanded' fruition systems (physical and virtual) capable of enhancing the user experience with multi-sensory input design. Through the definition of a theoretical framework of taxonomy of the inaccessibility of the investigated context, the project will identify scenarios that re-insert religious architectures in the circle of possible experiences in situ, determining a virtuous effect on the local economy and on the regeneration of the contexts of membership. In particular, the expected result is the encoding of a operational workflow for 'inclusive' accessibility and 'expanded' usability of religious architecture even during the implementation of safety measures (provisional works). Among the impacts of the research, there is the possibility of adopting the operational workflow for other classes of cultural heritage for the acquisition of future funding for enhancement interventions.

Involved Staff: Vincenzo Cirillo, Ornella Zerlenga, Alessandra Cirafici, Piscitelli Manuela, Alice Palmieri, Miele Riccardo, Antonella di Luggo, Alessandra Lardo.

Status: Funded

Project start/end date: September 2023 - September 2025

Project title: Geometric Equilibrium Of Stone Structures - GEOSS

Scientific coordinator Claudia Cennamo

Call title: Call for proposal for the funding of fundamental and applied research projects dedicated to researchers not recipients of other funding

Abstract: Current formulations of computational calculus at the elastic continuum are often inconsistent with the study of past architectures created with methodologies and materials that don't consider the concepts of elasticity. To consistently and currently model and study such structures, a formulation based on principles of the relationship between form and equilibrium is intended, focusing on stability and geometry and no longer on strength. Recovering, in other words, the Vitruvian concept of firmitas, utilitas, and venustas to transfer it to a current conception

of numerical calculation. To this end, it is necessary to rise to the conviction that the architecture of the past should be read more according to specific classical architectural typologies (arches, vaults, domes, trilithons, architraves, piers, etc.) instead of following the theory of the elastic continuum, as the classical bibliography has taught so far. Starting from the curved structures, we intend to verify their efficiency from a geometric-structural point of view while also considering the presence of damage and defects as factors of performance loss whose quantification is difficult a priori. In this context, identifying arches and vaults on the coasts of Campania as typological invariants can be a starting point of the study. The "choral" value of spontaneous architecture and its proposing itself as part of the landscape, with the purity of volumes and the constructive logic of the vaults, seems to anticipate the principles of functional architecture to claim a cultural priority of "Mediterranean" architecture over European rationalism.

Involved Staff:: Giorgio Frunzio, Carolina DFe Falco, Fabiana Forte, Mariateresa Guadagnuolo, Luciana Di Gennaro, Luigi Massaro, Luca Damiani

Partner: Dipartimento di Ingegneria

Status: idoneo, non finanziato

Date di sottomissione: 15 marzo 2024

Project title: Shape and sTructure in mAsonry staiRcasES in Naples. Criteria for the definition of knowledge models for safeguard and local tradition enhancement (STARES)

Scientific coordinator: Vincenzo Cirillo

Call title: Bando di Ateneo per il finanziamento di progetti di ricerca fondamentale ed applicata dedicato ai giovani Ricercatori D.R. 509/2022

Abstract: STARES will investigate masonry staircases using inter-disciplinary state-of-art criteria, techniques, and tools for the preparation of knowledge models useful for critical analysis, recovery, and enhancement of the asset. The most recent European provisions on cultural heritage enhancement are giving main importance to (i) the safeguarding of the places identity values, (ii) the recovery of local traditions and, (iii) the virtualization of contexts and inclusive use. Within this context, STARES will focus on the masonry staircases of the Neapolitan 18th century located in residential palaces and based on renowned models designed by the architect Fernando Sanfelice: a built heritage of immense architectural and cultural value, which also contains a construction tradition to be known and recovered to safeguard it.

Involved Staff: Vincenzo Cirillo, Corrado Chisari, Ornella Zerlenga

Status: Funded

Project start/end date: Septmebr 2023 - April 2024

Title of the project: Artificial Intelligence to assess the structural/seismic Damage to historic heritage in BIM environment (AIDaBIM)

Scientific coordinator: Claudia Casapulla

Responsible of Research Unit: Ornella Zerlenga (UniCampania), Claudia Casapulla (Unina)

Program Title: PRIN 2022 PNRR

Abstract: The project's purpose is to create a new digital tool for the semi-automatic assessment of damage in order to aid in the preservation and management of the built heritage, particularly masonry churches that have structural issues. This will be implemented through the use of advanced digital technologies, such as building information modelling (BIM) and artificial intelligence (AI). Additionally, a novel approach is put forth to digitise the process of the observed structural damage to churches and to establish quick, accurate assessments of the associated damage states. The generated data will be gathered in a database that can potentially be implemented in DaDO, an Italian Civil Protection platform of observed building damage.

Involved Staff: Ornella Zerlenga, Antonella di Luggo, Pasquale Argenziano.

Status: Funded

Project start/end date: November 2023 – November 2025

Title of the project: WRENCH - Whispers of Time: Heritage as Narratives of Climate-Change

Scientific coordinator: Prof. Marco Armiero (Autonomous University of Barcelona)

Call title: Collaborative Research Action (CRA) - Climate & Cultural Heritage (CCH) 2023

Abstract: WRENCH aims to address the effects of climate change on tangible and intangible heritage, while broadening the understanding of heritage to include narratives, narratives, and ephemeral legacies. WRENCH envisions cultural heritage as both something at risk and something that can tell a story about the risk we are all taking. WRENCH has the dual objective of (a) developing a transdisciplinary methodology involving environmental sciences, engineering and humanities to investigate the impact of climate change on tangible and intangible heritage; (b) use heritage as a storytelling tool to improve awareness of climate change.

Involved Staff: Corrado Chisari (Local Principal Investigator), Gianfranco De Matteis, Mattia Zizi, Michelangelo Scorpio, Sergio Sibilio

Partner institutions: Autonomous University of Barcelona (PI), Durham University, Orta Dogu Teknik Universitesi, Hidromod, Durham Castle, Diocesi di Ragusa - Chiesa Madre Duomo di San Giorgio, Consorzio "Coop4Art"

Status: approved

Submission/starting/closing date: 08-09-2023/30-06-2024/--

Title of the project: Evaluation of structural vulnerability and innovative intervention methods for the protection of masonry historical constructions of Italian infrastructural heritage (CUP: B61B21005470007)

Scientific coordinator: Prof. Gianfranco De Matteis

Program title: Programma Operativo Nazionale Ricerca e Innovazione 2014-2020

Abstract: The research activities deal with the development of methodologies for the structural vulnerability assessment of historical masonry constructions. In particular, the methodologies refer to infrastructural constructions (bridges) and address the problem following both a large-scale and a single-construction approach. The activities entail: i. the development of methodologies for the structural vulnerability assessment at a large scale; ii. vulnerability assessment methodologies by means of Finite Element Models; iii. the proposal of innovative, low-invasive and reversible retrofitting techniques.

Involved Staff: Mattia Zizi, Gianfranco De Matteis

Partner institutions: Fabre Consortium

State of the project: Positively evaluated/funded/ongoing

Starting/closing date: 01-01-2022/31-12-2024

Project title: Fashion Alive.

Scientific coordinator: Roberto Liberti

Research Unit of Vanvitelli: Ornella Cirillo, Chiara Scarpitti, Vincenzo Cirillo

Call title: European Commission CREA-CULT 2021 Coop1

Abstract: The FASHION ALIVE project promotes sustainable practices in the fashion industry, through the creation of events to involve a wider audience and raise awareness on this issue. The FASHION ALIVE Project approach is supported by three different partners: on the one hand, CREAMODITE (Spain), UMINHO (Portugal) and UNICAMPANIA (Italy) will conceptualize and experiment the creation of sustainable fashion methods, where each partner will work on a specific

innovative methodology. In parallel, XSENTRIK (Austria) explores and envisions a digital and audiovisual strategy using technological tools (combination of video, 3D projection, video mapping software, sound, light and music created by artificial intelligence).

Involved Staff: Alessandra Avella, Pasquale Argenziano, Vincenzo Cirillo, Lorenzo Capobianco, Alessandra Cirafici, Caterina Cristino Fiorentino, Gabriele Pontillo, Giulia Ceriani Sebreghondi, Danila Jacazzi, Antonella Violano

Partners: Creamodite Asociacion para la constitucion y reestructuracion de empresas de moda. disenyo y tecnologia (Madrid); Universidade do Minho (Lisboa); Università degli Studi della Campania Luigi Vanvitelli (Italy); Xsentrikarts platform for arts (Austria)

Status: finanziato

Project submission/start/end date: 2022/2024

Title of the project: Structural Assessment and development of innovative saFEguard Measures fOr hisTORIcal masONry towers_SAFEMOTION

Principal Investigator: Prof. Gianfranco De Matteis

Call title: PRIN 2022-PNRR

Description of the research activities of the project: SAFE_MOTION aims at developing innovative techniques and methods for investigation, assessment and retrofitting of historical masonry towers, in order to enhance their conservation, use, fruition and to extend their residual life. To reach the objective, complementary expertise of the research units will be provided, namely in the fields of dynamic monitoring, identification and damage assessment, numerical modelling, structure testing and retrofitting design.

Involved Staff: Giorgio Frunzio, Mariateresa Guadagnuolo, Corrado Chisari, Mattia Zizi, Luciana Di Gennaro

Partner institutions: University of Padova, University of Udine

State of the project: ongoing

Submission date: 30-11-2022/12-2023/11-2025

Title of the project: Inclusive Cultural Heritage in fragile areas for wider accessibility and knowledge dissemination

Scientific coordinator: Saverio D'Auria

Responsible of Research Unit: Luigi Corniello (UniCampania); Saverio D'Auria (Federico II).

Program Title: PRIN 2022 PNRR

Abstract: The research project "Inclusive Cultural Heritage in fragile areas for wider accessibility and knowledge dissemination" examines the theme of accessibility to cultural heritage, paying particular attention to the elements located in fragile areas from a social and territorial point of view. The project therefore aims to achieve a high level of "multiscalar information digitization" of cultural heritage through the development of a methodological process aimed at the transversality of knowledge that allows researchers and scholars, of different disciplines, to communicate and interact on an information platform through the sharing (and interrogation) of the digital model of the object of study obtained through a highly reliable 3D survey from a morphometric and colorimetric point of view.

Involved Staff: Luigi Corniello, Gennaro Pio Lento, Felicia Di Girolamo

Status: not funded

Project submission/start/end date: 2022

Project title: LOST_Gothic Line. Gotico vs Barocco: alla ricerca dell'identità nascosta del Sud Italia.

Scientific coordinator: Mara Capone “Vanvitelli” Research Unit Coordinator: Alessandra Avella
Call title: PRIN 2022 PNRR

Abstract: Starting from the Cultural Identity of Southern Italy, based on the common belonging to the Kingdom of Naples\Sicily, the "LOST_Gothic Line" project aims to become a network capable of promoting experiences with Cultural Heritage, reinforcing the sense of belonging and improving human WELL-BEING. The objective will be achieved through: the use of 3D models, digital twins and visual images to disseminate cultural content, starting from architecture and art history research; the activation of processes for the involvement of all users, citizens, including the blind, tourists and scholars; the use of both digital media and physical models to go back to the past and rediscover the LOST identity. The “Gothic Line” is in many cases LOST because most of the buildings and urban contexts appear very different from their original appearance following transformations or destructions. Starting from the most important examples of Gothic Architecture in Naples up to the minor centers of Southern Italy, the Gothic Line will be drawn on the map, joining the strategic points, which are real places or places of memory. The research develops “GothA_Gothic Algorithmic”, an innovative parametric tool for the design of some prototypes connected to the Gothic Line brand in order to Promote the development of Creative Cultural Industries based on an innovative customized design process that could be developed in specific spin-offs university students.

Involved Staff: Mara Capone, Alessandra Avella, Francesca Capano, Paola Vitolo, Andrea Pane, Fulvio Rino, Anna Alfieri, Francesco Bifulco, Saverio Carillo; PhD students: Riccardo Miele, Maria D’Uonno.

Partner institutions: Università della Campania "Luigi Vanvitelli", Università degli Studi di Napoli Federico II.

Status: not funded

Project submission/start/end date: November 2022

Project title: designIng real aNd virTual built EnviRonments For humAn Centered rEsearch (INTERFACE)

Scientific coordinator: Giovanni Ciampi

Call title: PRIN 2022 PNRR

Abstract: The goal of the project is to combine virtual reality and Human-Centered Living Labs, multi-sensory and multi-domain immersive virtual environments, monitoring the participants and the test environment. Currently there are no guidelines or standards for the design of these complex and environmental tests, highlighting the need to define the main objective and subjective factors to be considered and monitored. In this regard, the project aims to determine these criteria by comparing and analyzing objective and subjective data from real and virtual test environments. This data will be used to develop, calibrate and validate an immersive virtual model of the test environment. Then, participant feedback will be collected by questionnaire administration during a case study in an immersive virtual environment. At the same time, their physiological responses will be monitored and measured through a series of wearable sensors. Comparison of data from real

and virtual environments will allow to define key indicators. **Involved Staff:** Vincenzo Cirillo, Martina Gargiulo, Davide Carleo, Fabiana Guerriero, Salamone Francesco.

Partners: Consiglio Nazionale delle Ricerche italiano - Istituto per le Tecnologie della Costruzione (CNR-ITC).

Status: Not funded

Project submission/start/end date: November 2022

Project title: Geopolymers for Advanced Eco-Architecture: A Chemo-rheology and Thermo-kinetic investigation for the development of 3D Printable formulations - GEA

Scientific coordinator: dott.ssa Laura Ricciotti;

Call title: PRIN 2022 PNRR

Abstract: The GEA project deals with optimizing geopolymer (GP) formulations, through the alkaline activation of different kinds of aluminosilicate wastes, for their use as materials, in the 3D- printing of advanced housing units in sustainable buildings. The GEA project aims to develop an innovative strategy to overcome the main limits of a large-scale application of 3D printing of GP materials through a systemic and highly interdisciplinary approach. This innovative method allows the recycling and re-utilization of different kinds of waste, which would represent a significant contribution to sustainable development towards the adoption of the “zero waste” principle.

Involved Staff: Ricciotti Laura, Aversa Raffaella, Iannace Gino, Franchino Rossella, Frettoloso Caterina, Pisacane Nicola; PhD student Salima Zerari

Partner institutions: Università degli Studi della Campania "Luigi Vanvitelli", Università degli Studi "G. d'Annunzio" CHIETI-PESCARA

Status: Funded

Project submission/start/end date: November 2022

Project title: Sud Italia. Culture and entertainment branding strategies using ICT and social networks.

Scientific coordinator: Manuela Piscitelli

Call title: PRIN 2022 PNRR

Abstract: The research aim is to analyse and communicate the potential of the Southern Italian territory in order to disseminate it both to the local inhabitants to encourage identity processes and communities' 're-appropriation' of the territory, and to potential visitors and investors. The project proposes the adoption of a place marketing and communication strategy systemic approach, namely it intends to focus on the valorisation through constant communication of a widespread heritage, in which each piece can be related to others, also relying on a shared promotional action that favours the understanding of the heritage as a whole. In this direction, the creation of a brand for the Southern Italy and its visual identity is proposed, and the design of an integrated communication system for the Southern Italy, which, by using the potential of ICT and social media, will act as an open, implementable and participatory platform for the awareness, the valorisation, and the promotion of the Southern territories in all their material and immaterial components. To these ends, a web and social platform for the communication of thematic routes appropriately designed taking into account the strategic assets of the Southern Italy will be developed as output of the research.

Involved Staff: Alessandra Cirafici, Barbara Masiello, Antonella Garofano, Massimiliano Campi, Alessandra Pagliano, Valeria Cera, Mara Gallo.

Partners: Università degli Studi di Napoli Federico II

Status: Not funded

Project submission/start/end date: November 2022 **Project title:** Designing with More-than-Human. Phygital interactions and artifacts for a transdisciplinary and post-anthropocentric manufacture. (De+Human)

Scientific coordinator: Chiara Scarpitti

Call title: Bando di Ateneo per il finanziamento di progetti di ricerca fondamentale ed applicata

dedicato ai giovani Ricercatori D.R. 509/2022

Abstract: Description of the research project activities: Characterised by a dual nature – theoretical and applicative - the project aims at laboratory and transdisciplinary experimentation of processes and products on the borderline between design, digital technologies and nature, with a view to raising awareness of the most pressing issues related to multi-species coexistence and environmental ecosystems. Through international research mappings and philosophical speculations, the project aims to reshape the meaning of sustainable production within the postanthropocentric paradigm, discussing its domain and recontextualising objectives, technologies, aesthetics.

Involved Staff: Alessandra Cirafici, Roberto Liberti, Alice Palmieri, Daniela Piscitelli, Patrizia Ranzo, Maria Antonietta Sbordone, Rosanna Veneziano. PhD students: Annarita Bianco, Noor Fajrina Farah Istiani, Giulio Giordano. Assegnista di Ricerca: Marzia Micelisopo.

Status: funded

Project submission/start/end date: 01.10.2022/12.12.2023

Title of the project: “Integrated PRocedure for assEssing and improVing the resiliENce of existing masonry bell Towers on a territorial scale” - PREVENT

Scientific Coordinator: Prof. Gianfranco De Matteis

Call title: VALERE 2019

Description of the research activities of the project: Enhancement and conservation of bell towers, with a multidisciplinary and multilevel approach, developed through three main research lines: Knowledge and survey (Zerlenga); Control and monitoring (Sibilio); Structural assessment and preservation (De Matteis). Such research lines develop independently but are strongly interconnected to each other. They converge in the fourth cross-cutting research line, which defines the main objective and result of the whole research, namely: Preservation and valorisation of exiting bell towers (All).

Involved Staff: Gianfranco De Matteis, Ornella Zerlenga, Sergio Sibilio, Corrado Chisari, Vincenzo Cirillo, Giovanni Ciampi, Daniela Cacace, Rosina Iaderosa, Giuseppina Iuliano, Mattia Zizi, Angelo Lavino, Yorgos Spanodimitriou, Riccardo Miele, Margherita Cicala

Partners: Intra-University project competition

Project status: finished

Submission date/Start/End of the project: 13-02-2019/02-12-2019/02-12-2022

Project title: PON AIM (Code AIM1879349-2)

Scientific coordinator: Prof. Ornella Zerlenga

Call title: Programma Operativo Nazionale Ricerca e Innovazione 2014-2020

Abstract: Definition of refunctionalisation, static-conservative and seismic improvement interventions, to be implemented on a large scale, based on effective, sustainable and innovative techniques and technologies, able to guarantee adequate performance levels, while respecting the historical and cultural value of the asset.

Involved Staff: Corrado Chisari, Gianfranco De Matteis

Status: financed

Project submission/start/end date: 22-07-2019/21-07-2022 **Title of the**

project: High-performance materials for sustainable structures **Principal**

Investigator: Prof. Vincenzo Piluso (University of Salerno) **Call title:**

PRIN 2022

Description of the research activities of the project: The resistance of the material and the

related structural performances is no more sufficient in performance evaluation, as soon as other issues need to be included, such as those related to sustainability. In this research project, the attention is focused on the performance evaluation of stainless steel and aluminium alloys including cradle-to-gate and gate-to-site environmental performances, structural performances in terms of exhibited ultimate resistance and ductility, the resulting greenhouse emissions of structures as affected by the required safety levels and the life-cycle behaviour as affected by the corrosion resistance.

Involved Staff: Gianfranco De Matteis (Local Principal Investigator)

Partner institutions: University of Salerno (PI), University of Campania “Luigi Vanvitelli”, University of Padova, University of Catania

State of the project: not funded

Submission date/Start: 27-03-2022.

Title of the project: DAMAGES - Damage effects Assessment on residual safety level of Masonry Arch bridges

Principal Investigator: Prof. Paolo Zampieri (Università degli Studi di Padova)

Call title: PRIN 2022-PNRR

Description of the research activities of the project: The DAMAGES project aims to propose innovative solutions for the evaluation of existing masonry arch bridges subject to exceptional environmental actions through: (i) improving the understanding of the cause-effect processes that induce complex damage scenarios in masonry bridges; (ii) the definition of adequate constitutive models for the description of the non-linear behavior of the masonry material that takes into account the pre-existing degradation, which will include probabilistic approaches to consider the non-deterministic nature of the mechanical properties of the constituents and the uncertainty in the distribution/location of the damage; (iii) to develop effective strategies for the assessment of masonry bridges damaged to the point of collapse to investigate the evolution of the level of safety. The interaction of different damage scenarios could induce an unconventional loss of strength and/or stability of the bridge, thus requiring innovative techniques to predict its ultimate condition. To address this challenge, a key aspect of DAMAGES will be the integration of advanced numerical strategies developed by probabilistic approaches aimed at estimating failure through the definition of appropriate fragility curves.

Involved Staff: Corrado Chisari (Local Principal Investigator), Roberto Serpieri

Partner institutions: University of Padova (PI), University of

Perugia State of the project: ongoing

Submission date: 30-11-2022/12-2023/11-2025

Title of the project: TRAILED-LAB: Un Laboratorio Mobile a Servizio dei Comuni del Cratere

Principal Investigator: Prof. Giuseppe Brando, University “G. d’Annunzio” of Chieti-Pescara

Call title: Avviso per la selezione di progetti di promozione della ricerca, del trasferimento tecnologico e della formazione universitaria da finanziare nelle regioni Lazio, Abruzzo, Umbria e Marche interessate dagli eventi sismici del 2016

Description of the research activities of the project: “TRAILED-LAB” is a new research centre integrating mobile facilities for in-situ measurements of materials, structures and infrastructures, with fixed standard facilities. TRAILED-LAB aims at providing an advanced instrument for supporting reconstruction and decision-making processes, for both assessments of recovery interventions for seismically damaged buildings and infrastructures and addressing the choices on the re-use of construction materials of collapsed buildings.

Involved Staff: Gianfranco De Matteis (Local Principal Investigator), Corrado Chisari, Mattia Zizi

Partner institutions: University “G. d’Annunzio” of Chieti-Pescara (PI), University of Camerino, National Institute of Geophysics and Vulcanology -INGV

State of the project: ongoing

Submission date: 25-02-2022/01-12-2023/30-11-2026

Title of the project: WRENCH - Whispers of Time: Heritage as Narratives of Climate-Change

Principal Investigator: Prof. Marco Armiero (Autonomous University of Barcelona)

Call title: Collaborative Research Action (CRA) - Climate & Cultural Heritage (CCH) 2023

Description of the research activities of the project: WRENCH aims to address the effects of climate change on tangible and intangible heritage, while broadening the understanding of heritage to include narratives, narratives, and ephemeral legacies. WRENCH envisions cultural heritage as both something at risk and something that can tell a story about the risk we are all taking. WRENCH has the dual objective of (a) developing a transdisciplinary methodology involving environmental sciences, engineering and humanities to investigate the impact of climate change on tangible and intangible heritage; (b) use heritage as a storytelling tool to improve awareness of climate change.

Involved Staff: Corrado Chisari (Local Principal Investigator), Gianfranco De Matteis, Michelangelo Scorpio, Sergio Sibilio

Partner institutions: Autonomous University of Barcelona (PI), Durham University, Orta Dogu Teknik Universitesi, Hidromod, Durham Castle, Diocesi di Ragusa - Chiesa Madre Duomo di San Giorgio, Consorzio “Coop4Art”

State of the project: approved

Submission date: 08-09-2023/--/--

Project title: Evaluation of structural vulnerability and innovative intervention methods for the protection of masonry historical constructions of Italian infrastructural heritage (CUP: B61B21005470007)

Scientific coordinator: Prof. Ing. Gianfranco De Matteis

Call title: Programma Operativo Nazionale Ricerca e Innovazione 2014-2020

Abstract: The research activities deal with the development of methodologies for the structural vulnerability assessment of historical masonry constructions. In particular, the methodologies refer to infrastructural constructions (bridges) and address the problem following both a large-scale and a single-construction approach. The activities entail: i. the development of methodologies for the structural vulnerability assessment at a large scale; ii. vulnerability assessment methodologies by means of Finite Element Models; iii. the proposal of innovative, low-invasive and reversible retrofitting techniques.

Involved persons: Mattia Zizi, Gianfranco De Matteis

Partner institutions: Fabre Consortium

Status: funded

Project submission/start/end date: 2021/01-01-2022/ 31-12-2024

Project title: Digital narratives for cultural heritage, in a perspective of audience development

Scientific coordinator: prof. Alessandra Cirafici

Call title: PON_ 2014-2020 Ricerca e Innovazione - Ricercatori a tempo determinato di tipologia A. DM n.1062 del 10 agosto 2021. Azione IV.4 Innovazione

Abstract: the project intends to investigate fruition strategies to enrich the in-presence visit experience through the use of multisensory augmentation devices; to strengthen the remote visit experience by offering a synchronous mode that enriches the online dimension with an interactive

experiential quality (onlife); proposing new formats for the elaboration of content in a design-for-all perspective that takes into account different abilities and makes the experience more interesting for all users; enabling small museums to access innovative technologies at reduced costs in order to enrich the visitor experience and attract new visitor segments.

Involved persons: Alessandra Cirafici

Partner institutions: Protom Group s.p.a.

Status: funded

Project submission/start/end date: 2021/01-01-2022/31-12-2024

Project title: DESIRE - DEsign Solutions for Industry 4 REady processes

Scientific coordinator: Dott. Pasquale Savino

Departmental Principal Investigator: Prof. Luigi Maffei

Call title: Avviso per la presentazione di progetti di ricerca industriale e sviluppo sperimentale nelle 12 Aree di specializzazione individuate dal PNR 2015-2020 - Ministero dell'Università e della Ricerca

Abstract: The Project aims to optimize production processes and improve logistics management, through the use of the most advanced ICT technologies that allow the virtualization of transformation processes, always placing at the center of everything the people who represent the human capital of our Smart Factories. DADI is involved in the "Integration between Building Information Modeling (BIM) Methodologies and Process Design" activities.

Involved persons: Proff. Luigi Maffei, Massimiliano Masullo, Nicola Pisacane, Alessandra Avella, Pasquale Argenziano, Giovanni Ciampi.

Partner institutions: Stellantis/FCA ITALY S.p.A. (capofila), Università degli Studi della Campania "Luigi Vanvitelli" - Dipartimento di Ingegneria Industriale e dell'Informazione, Università degli Studi della Campania "Luigi Vanvitelli" - Dipartimento di Architettura e Disegno Industriale, Step Sud Mare SSM.

Status: funded

Project submission/start/end date: start September 2020/close February 2023

Project title: DADI_DOC. Department of Architecture and Industrial Design_Teacher Documentation Archive

Scientific coordinator: Ornella Zerlenga

Call title: Public notice in question, pursuant to the rankings published in the BURC n. 82 of 20/11/2023 (Campania Region)

Staff involved: Chiara Ingrosso, Vincenzo Cirillo, Francesca Castanò

Partner bodies: UID, Unione Italiana Disegno, Archives section

Project status: funded

Project submission/start/end dates: 06-30-2024/06-30-2025

Project title: ARPAE – PUBLIC RESIDENTIAL ARCHITECTURE BETWEEN NAPLES AND CASERTA

Scientific director: Ornella Zerlenga

Call title: Public notice in question, pursuant to the rankings published in the BURC n. 82 of 20/11/2023 (Campania Region) **Personnel involved:** Claudia de Biase, Francesca Castanò, Vincenzo Cirillo

Partner bodies: -

Project status: funded

Project submission/start/end dates: 30-06-2024/30-06-2025

Project title: CHANGES - Cultural Heritage Active Innovation for Sustainable Society.

Scientific coordinator: Giuliano Volpe, Sapienza University of Rome

Call title: National Recovery and Resilience Plan (PNRR) mission 4, “Education and Research”, Code PE00000020, CUP H53C22000860006, Spoke 1 “Historical Landscapes, Traditions and Cultural Identities”. University of Bari Aldo Moro.

Staff involved: Ornella Zerlenga

Partner institutions: Sapienza University of Rome, Alma Mater Studiorum – University of Bologna, Scuola Normale Superiore of Pisa, Ca’ Foscari University of Venice, University of Bari Aldo Moro, University of Bergamo, University of Catania, University of Florence, University of Milan, University of Naples Federico II, University of Turin, Roma Tre University, Suor Orsola Benincasa University

Project status: funded

Project submission/start/end dates: 01-01-2023/31-12-2025

Project title: TE.MP.I. - Cultural territories: Participatory mapping and advanced technologies for landscapes of internal areas.

Scientific coordinator: Laura Baratin (University of Urbino)

Call title: National Recovery and Resilience Plan (PNRR) mission 4, “Education and Research” - component 2, “from research to business” - investment line 1.3, funded by the European Union – Nextgenerationeu”, project “CHANGES - Cultural Heritage Active Innovation for Sustainable Society” code PE00000020, CUP H53C22000860006.

Personnel involved: Ornella Zerlenga, Adriana Galderisi, Giada Limongi, Francesca Gasparetto.

Partner bodies: Quattroemme srl

Project status: eligible not funded with Seal of Excellence

Project submission/start/end dates: 31-06-2024

Title of the project: PON AIM (Codice proposta attività AIM1879349-2)

Scientific coordinator: Luigi MAFFEI

Call title: Programma Operativo Nazionale Ricerca e Innovazione 2014-2020

Abstract: Definition of refunctional, static-conservative and seismic improvement interventions, to be implemented on a large scale, based on effective, sustainable and innovative techniques and technologies, which are able to guarantee adequate levels of performance, respecting the historical and cultural value of the asset.

Involved Staff: Corrado Chisari, Gianfranco De Matteis

Status: funded

Project submission/start/end date: from 22/07/2019 to 21/07/2022

Project title: Dottorati di Ricerca Innovativi a caratterizzazione industriale, Architettura Disegno Industriale Beni Culturali (codice DOT1349530)

Scientific coordinator: Ornella ZERLENGA

Call title: Dottorati di Ricerca Innovativi a caratterizzazione industriale, Architettura Disegno Industriale Beni Culturali

Abstract: technologies and applications for the conservation, management and enhancement of cultural heritage.

Involved Staff: Ornella Zerlenga, Carlos Josè Parra Costa, Margherita Cicala

Partner institutions: University of Cartagena, Spain **Status:** positively evaluated / funded / ongoing **Project submission/start/end date:** 2020/2023

Scientific products during the last three years:

10 scientific publications in Class A journals and/or indexed in the Scopus/WoS databases:

- [1] PALMIERI, A. (2023). Midjourney experimentation: representing Nature on a macro scale. In: Scires-it, vol. 13 Issue 1, pp. 181-188.
- [2] PISCITELLI, M. (2022). From 3D scanning to Virtual Tours for the fruition of Architectural Heritage. The Church of Santa Maria della Purità. In: Scires-it, vol. 12 Issue 2, pp. 55-68.
- [3] ZIZI, M., CHISARI, C., DE MATTEIS, G., (2023). Effects of pre-existing damage on vertical load-bearing capacity of masonry arch bridges. Engineering Structures 300:117205. DOI: 10.1016/j.engstruct.2023.117205.
- [4] ZERLENGA, O., CIRILLO, V., CICALA, M. (2023). Drawing, Shapes and Parametric Design of Rod and Node Architectural Structures. Nexus Netw J 25 (Suppl 1), 303–311 (2023). <https://doi.org/10.1007/s00004-023-00722-3>
- [5] ZERLENGA, O., CIRILLO, V. (2023). Guarino Guarini y el proyecto de escaleras en los tratados italianos. Informes De La Construcción, 75(572), e517. <https://doi.org/10.3989/ic.6420>
- [6] ZERLENGA, O., CIRILLO, V. (2022). The Main Staircase of Palazzo Spinelli di Laurino in Naples. Function, Shape, Geometry. In Ródenas-López, M.A., Calvo-López, J., Salcedo-Galera, M. (Eds), Architectural Graphics. EGA 2022. Springer Series in Design and Innovation (pp. 405-414). Cham: Springer. ISBN: 978-3-031-04632-2.
- [7] RICCIOTTI, L., APICELLA, A., PERROTTA, V., AVERSA, R. (2023). Geopolymer Materials for Bone Tissue Applications: Recent Advances and Future Perspectives. In Polymers, 15 (5), art. no. 1087.
- [8] ZERLENGA, O., CHARIF, H. B., IADEROSA, R. (2024). Low-Cost Photogrammetry for Detailed Documentation and Condition Assessment of Earthen Architectural Heritage: The Ex- Hotel Oasis Rouge in Timimoun as a Case Study. Building Materials, and Repair & Renovation 2024, 14, 3292, pp. 1-15. Special issue of Buildings (ISSN 2075-5309), editors Mariana Correia, Telma Ribeiro. <https://doi.org/10.3390/buildings14103292>
- [9] GILOTTA F., CARAFA V., MORPURGO G., RIZZO C., CIRAFICI A., AVELLA A., ARGENZIANO P., PATRIZIANO T., MICOZZI M., GALIFFA F., LUCCHETTI L., BENTZ M., BECK D., BIRKNER F., BRIESACK C., KLUGE P., LANG M., COEN A., ZINNI M. (2022). Researches at the Monte Abatone necropolis (Cerveteri). Archeologia e Calcolatori, p. 135-152, ISSN 1120-6861, e-ISSN 2385-1953.
- [10] ZERLENGA, O., CIRILLO, V., DI RIENZO, C. (2023). Drawing, design, and new images of ephemeral architecture in Paris in 1739. In: DISEGNARECON, Architectural Heritage Imaging, vol. 16, n. 31, December 2023, pp. 1-16. ISSN 1828-5961. Indexed in SCOPUS. <https://doi.org/10.20365/disegnarecon.31.2023.5>

Additional 10 scientific products:

- [1] CIRAFICI, A., ZERLENGA, O. (2023) (a cura di) Nuove frontiere nel Disegno | New frontiers in Drawing. DADI_PRESS, ISBN: 978-88-85556-24-9, pp. 1-360.
- [2] CIRAFICI, A., MELILLO, L. (2023) (a cura di) I saperi di Eumachia al Museo Archeologico Nazionale di Napoli. Antichi tessuti, nuovi racconti. TORINO: Hapax Editore, ISBN: 979-12- 80188-15-1, pp 1-238
- [3] PALMIERI, A. (2023). Coloured Patterns: Designing Urban Spaces Through Chromatic Abstractions. In: Villa, D., Zuccoli, F. (a cura di) Proceedings of the 3rd International and Interdisciplinary Conference on Image and Imagination. IMG 2021. Lecture Notes in Networks and Systems, pp. 1059-1068. [Codice Scopus: 2-s2.0-85152623270]
- [4] PISACANE, N., ARGENZIANO, P., AVELLA, A. (2023). Gems Geometry: From Raw Structure to Precious Stone. In: AA.VV.. (a cura di): Liang-Yee Cheng, Lecture Notes on Data

Engineering and Communications Technologies - ICGG 2022 - Proceedings of the 20th International Conference on Geometry and Graphics. LECTURE NOTES ON DATA ENGINEERING AND COMMUNICATIONS TECHNOLOGIES, vol. 146, p. 497-508,

Cham:Springer, ISBN: 978-3-031-13587-3, ISSN: 2367-4512, doi: 10.1007/978-3-031-13588-0

[5] ZERLENGA O., IADEROSA R. (2024). The vision of Artificial Intelligence. The Text-to- Image algorithm for contemporary architecture. In: Cristiana Bartolomei, Alfonso Ippolito, Simone Helena Tanoue Vizioli (a cura di). Contemporary Heritage Lexicon, vol. 1. Springer Nature. Series:Springer Tracts in Civil Engineering. ISBN 978-3031651038.

[6] PISCITELLI, M. (2022). Il carattere come motivo decorativo, dai capilettera al lettering. In: AA. VV. (a cura di): Cicalò E., Savini F., Trizio I., Linguaggi Grafici. Decorazione. Alghero: Publica, pp. 70-93, ISBN: 9788899586294.

[7] ZERLENGA, O., DE MATTEIS, G., SIBILIO, S., CIAMPI, G., CIRILLO, V., MIELE, R., SPANODIMITRIOU, Y., & IADEROSA, R. (2022). Open-source procedure for UAV-based photogrammetry and infrared thermography survey of masonry bell towers. In S. Parrinello, S. Barba, A. Dell'Amico & A. di Filippo (a cura di) D-SITE, Drones-Systems of Information on culTural hEritage. For a spatial and social investigation. Vol II (pp. 412-421). Pavia: Pavia University Press. ISBN: 978-88-6952-159-1.

[8] ZERLENGA O., FERNÁNDEZ COCA A., MIELE R. (2024). Dicotomie architettoniche. Il disegno dei chiostri nel progetto di Santa Maria della Sanità a Napoli | Architectural Dichotomies. The Design of the Cloisters in the Santa Maria della Sanità Project in Naples. In: Francesco Bergamo, Antonio Calandriello, Massimiliano Ciammaichella, Isabella Friso, Fabrizio Gay, Gabriella Liva, Cosimo Monteleone (eds.). MISURA / DISMISURA | MEASURE / OUT OF MEASURE. Atti del 45° Convegno Internazionale dei Docenti delle Discipline della Rappresentazione. Congresso della Unione Italiana per il Disegno. Padova-Venezia, 12-13-14 settembre 2024. Milano: FrancoAngeli open access, UID Series diségnno, pp. 2151-2174. ISBN digital version 9788835166948.

[9] ZERLENGA O., CIRILLO, V., IADEROSA R. (2024). 'Linee forza essenziali' nei manifesti futuristi. In: Rodríguez Barros Diana, Carlos Merlo, Victoria Ferraris (eds). In: Atti VIII Congreso Internacional de Expresión Gráfica en Ingeniería, Arquitectura y Carreras Afines: pasado, presente y futuro de la gráfica en América, Europa y África (EGraFIA). Córdoba (Argentina), 21-23 settembre 2023, 1a ed. compendiada. Córdoba: Universidad Nacional de Córdoba, Facultad de Arquitectura, Urbanismo y Diseño, 2024, pp. 423-430. ISBN digital version 978-987-8486-51-2.

[10] ZERLENGA O., CICALÒ E., MENCHETELLI V. (2022). Lock-drawn: disegni dalla quarantena. Una sperimentazione didattica ai tempi della pandemia | Lock-drawn: drawings from the quarantine. A didactic experimentation at the time of the pandemic. Napoli: La scuola di Pitagora, collana TEMI E FRONTIERE DELLA CONOSCENZA E DEL PROGETTO, n. 16/2022, p. 310. ISSN 2724-3699. ISBN 978-88-6542-879-5 (versione elettronica open access).

Relationships with international and national Companies, Institutions, Research Centers, Universities during the last three years:

Research activity with the University of:

Anhalt University Hochschule Dessau (Germany);

Central Technical Archive of Construction in Tirana (Albania);

Departamento de Arquitectura y Tecnología de la Edificación, Cartagena (Spain);

Escuela Técnica Superior de Arquitectura de Madrid;

Imperial College London (UK);

Politecnico di Milano;

Polytechnic University of

Madrid;

Polytechnic University of Tirana, Faculty of Architecture (Albania);

Polytechnic University of Tirana, Faculty of Civil Engineering (Albania);
Sapienza University of Rome;
Universidad de Alcalá Facultad, Escuela Técnica Superior de Arquitectura. Departamento de Arquitectura, Alcalá de Henares (Spain);
Universidad Politécnica de Cartagena, Escuela Técnica Superior de Arquitectura y Edificación;
Universidade de Lisboa, Faculdade de Arquitetura. Departamento de Artes, Humanidades and Ciências Sociais, Lisboa (Portugal);
University of Catania;
University of Padova
University of Udine;
University of Salerno;
University of Trieste;
Universitat de les Illes Balears (UIB), Higher Polytechnic School (Spain)
University of Applied Sciences, Hochschule Koblenz (Germany)
Fundação Cultursintra, Sintra (Portogallo)
Universidade de Lisboa, Lisboa (Portogallo)

Agreement for research activities with:

ReLUIIS (Network of University Laboratories of Earthquake Engineering) in the field of Vulnerability and Seismic Risk, for the support of activities of management technical emergency and related to seismic prevention programs, for the knowledge development and assistance in the drafting of technical standards. (Department of Civil Defense). ReLUIIS-DPC Project 2019-2021 and ReLUIIS-DPC 2022-2025, with particular reference to: WP2 (Inventory of existing structural and building types- CARTIS); WP4 (Risk maps and Seismic damage scenarios- MARS); WP12 (Regulatory contributions related to. Civil and industrial steel and steel-concrete composite constructions). Scientific responsible: Prof. Gianfranco De Matteis.

Memorandum of Understanding with:

ISPC - Istituto Scienze del Patrimonio Culturale, CNR (2024);
Agorinasce (2023);
Centro La Tenda Onlus (2023);
Unicef Campania (2023)
NAPOLICREATIVA (2023)
Riserva Naturale Oasi WWF Cratere degli Astroni
(2023) I Municipalità di Napoli (2023)
IACC - International Association of Color (2023)
8° Reggimento Bersaglieri – Caserta. Manifestazione Flik-Flok (2023)
Aeronautica Militare di Caserta – Scuola specialisti – Visual identity project of the exhibition entitled Il Volo come visione ed esperienza. Fra Tecnologia e Arte (Daniela Piscitelli, Ornella Zerlenga, Vincenzo Cirillo, Roberta Angari).
Reggia di Caserta e Unicompania DADI for Celebrazioni Vanvitelliane 1773-2023 – Visual identity project by Daniela Piscitelli, Ornella Zerlenga e Roberta Angari.
Archivio Piero Bottoni - DASTU - Dipartimento di Architettura e Studi Urbani, Politecnico di Milano (2022);
PACT - Parco Archeologico di Cerveteri e Tarquinia;
VIII Municipality of Naples (2017_in progress);
Ministry of Grace and Justice for survey and documentation of the Nisida Prison (2017_in progress);

Community Foundation of the Historic Center of Naples for the enhancement project of the bell tower of Santa Chiara (2018_in progress);
Morra Foundation for cultural dissemination: Cassano Ayerbo d'Aragona palace (2018_realized);
The school of Pythagoras for editorial training (2018_ ongoing);
Experimental Leather Station and Polytechnic of Leather;
San Gennaro Community Foundation Onlus (2019_ ongoing);
Protom Group Spa (2019_in progress);
Virto 360 (2019_ ongoing);
Sunto Srl (2019_ ongoing);
Province of Caserta (2019_ ongoing);
Nolana Area Agency - Local development agency of the municipalities of the Nolana area (2020);
MonasterY Santa Maria In Gerusalemme - Clarisse Cappuccine called "Le Trentatré" (2019_in progress);
La Contea Nolana Association (2020);
MU.S.A. Association (2020);
Festa dei Gigli Foundation (2020);
ITS BACT Foundation - Innovative Technologies for Cultural Heritage and Activities and Tourism (2020);
MiBAC Historical - Archaeological Museum of Nola (2020);
Morra Foundation - Dafna Gallery- Intragallery:
Voi siete qui / Vico Pero / Giacomo Leopardi (2020-2021)

Joint research with:

Animal Day Naples Association for Animal Rights Days at the PAN, Palazzo delle Arti in Naples;
Central Tyrrhenian Sea Port System Authority for the study of the coastline from the eastern industrial area and the former General Warehouses;
Municipality of Sorrento for the study of the cemetery complex of San Renato;
Ministry of the Environment for the Plastic free campaign: graphic design of the brand, registered by the University of Campania 'Vanvitelli' (2019_realized);
ReLUIS (Network of University Laboratories of Seismic Engineering) on Vulnerability and Seismic Risk, to support technical emergency management activities and related to seismic prevention programs, for the development of knowledge and assistance in the drafting of standards technical (Department of Civil Protection). ReLUIS-DPC 2019-2021 project, with particular reference to: WP2 (Inventory of existing structural and building typologies - CARTIS); WP4 (Risk maps and seismic damage scenarios - MARS); WP12 (Regulatory contributions relating to civil and industrial constructions of steel and steel-concrete compounds);
Fundação Cultursintra FP, Quinta da Regaleira, Sintra, Portugal for the relief of underground and epigean architecture in the Quinta da Regaleira;

Collaborations with Consortia, Scarl or other Institutions participated by the University of Campania Luigi Vanvitelli during the last three years:

Fabre Consortium "Research consortium for evaluation and monitoring of bridges, viaducts and other structures"
LICEO ARTISTICO, COREUTICO E MUSICALE - "Filippo Palizzi" Napoli

ISI Web of Science Subject Categories:

Architecture
 Communication
 Construction & Building Technology
 Engineering, Civil
 Engineering, Mechanical
 Engineering,
 Multidisciplinary
 Humanities,
 Multidisciplinary
 Materials Science, Characterization & Testing
 Materials Science,
 Composites Remote Sensing

Scientific-Disciplinary Sectors:

CEAR-06/A –Mechanics of Solids and Structures
 CEAR-07/A – Structural Analysis and Design
 CEAR-08/D – Design
 CEAR-10/A – Drawing
 CEAR-11/B – Architectural Conservation
 IIND-07/B – Building Physics and Building Energy Systems
 IMAT-01/A - Materials Science and Technology

Keywords:

graphic analysis
 audiovisual
 communication
 terrestrial and aerial photogrammetry
 GIS / Geographic Information Systems
 H-BIM / Building Information Modeling for Cultural Heritage
 digital narratives for the enhancement of cultural heritage
 graphic design
 representation of architecture and the environment
 Digital and integrated survey of architecture and the environment

ERC Categories:

PE8_10 Manufacturing engineering and industrial design
 PE8_11 Environmental engineering, e.g. sustainable design, waste and water treatment, recycling, regeneration or recovery of compounds, carbon capture & storage
 PE8_3 Civil engineering, architecture, offshore construction, lightweight construction, geotechnics
 SH1_10 Management; strategy; organisational behaviour
 SH3_12 Communication and information, networks, media
 SH5_4 Visual and performing arts, film, design and

architecture

SH5_6 History of art and architecture, arts-based research

SH5_7 Museums, exhibitions, conservation and restoration

SH5_8 Cultural studies, cultural identities and memories, cultural heritage SH5_12 Computational modelling and digitisation in the cultural sphere