Research Group

The System. Architectures and infrastructures for digitization

Reference year:

2025

Scientific Coordinator:

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Group members:

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SCAGLIARINI Noemi / PhD candidate / Dipartimento di Architettura e Disegno Industriale/Università degli studi della Campania ‘’Luigi Vanvitelli’’
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Group members belonging to other related offices in the network:
CALABRESE Federico / Associate professor / Faculdade de Arquitetura da UFBA
CECE Alessandro / Associate Professor / Department of Architecture, Xi'an Jiaotong- Liverpool University
CRUZ PINTO Jorge / Associate professor / Lisbon School of Architecture / Universidade de Lisboa
GHANIMEH Ali Abu/ Full professor / College of Engineering, University of Jordan
POPOVIC LARSEN Olga / Full professor / Institute of Architecture and Technology / Royal Danish Academy of Fine Arts
STELLA Antonello / Associate Professor / Dipartimento di Architettura / Univ. degli Studi di Ferrara

Description of research lines:

INNOVATIVE STRUCTURAL SYSTEM

The history of architecture has always been linked to new technical and scientific acquisitions. The most up-to-date developments in the structural field refer to the macro-sector of timber structures, through which a new and constantly updated language is proposed. This line of research addresses the theme of architecture for the industry of the future with specific attention to structures and the efficiency of materials. Gridshell, Reciprocal Frames, and Tensegrities are just some of the systems driving the ongoing space revolution. Against this background of the investigation, attention is focused on both next-generation functions and on possible welfare or emergency implications.

IMPACT OF THE DIGITAL INFRASTRUCTURE ON THE CONTEMPORARY CITY

The contributions related to the impact that these new structures have on the city, on man, and on the economy converge in this line of research. The need to build these structures near large urban centers or within the semi-peripheral belt, especially in reference to seamless and densely populated urban fabrics, arises from an analysis that takes into account the various urban aspects, architectural and economic. Similarly, there is a need to consider the adaptive reuse of the huge existing building stock in reference to innovative functions such as data centers, logistics hubs, or new activities based on total human-machine interaction or support for digital services.

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

SINO-ITALIAN URBAN REGENERATION HUB

Scientific manager: Alessandro Cece
Participants: Ernesto d'Alfonso, Antonella Contin, Laura Daglio, Pasquale Mei, Alessandra Casu, Gianluca Cioffi, Giavanni Santamaria, Fei Chen, Yunqing Xu;
Reference laboratory: Design School XJTLU

The establishment of the Sino-Italian Urban Regeneration HUB stems from the recognition of a precise market need expressed by the Italian design industry and the potentiality offered by the context of the Chinese urban construction sector. The HUB offers at the DES School an opportunity to explore the topic of urban regeneration in contemporary China. After the rapid growth of the last

two decades, China's spatial, urban, and architectural development is at a crucial stage. A renewed awareness and sensitivity to issues of sustainability and land consumption are ushering in a phase that calls for new strategies to understand the urban territory and re-signify the physical environment.

It is with these assumptions that the Sino-Italian Urban Regeneration HUB finds its mission, promoting the Italian morpho-typological approach, known worldwide for its ability to work in a multi-scalar and meta-historical way, as a cutting-edge research methodology and design practice. This represents an opportunity to advance scientific knowledge and promote innovation in Urban Regeneration, exploring the mutual influences of Chinese and Italian cultures.

The HUB, with the support of engineering, architecture, and economic consulting organizations, connects academia with the public and private sectors. It focuses on research into new urban design tactics and advances in architectural technologies. In this way, it aims to usher in a new urban strategy, reflecting the changing paradigms of the new sensibility that is the seed of the Chinese urbanity, uniting past, present, and future.
Hydraulic, Environmental and Maritime Infrastructure Optimization and Smart Water Network
Ottimizzazione delle infrastrutture idrauliche, ambientali e marittime e Reti idriche Intelligenti
Scientific manager: Michele DI NATALE
Participants: Armando DI NARDO; Dino MUSMARRA; Daniela RUBERTI; Marco Vigliotti; Caterina ERAMO; Stefania DI RONZA; Immacolata BORTONE; Carlo GIUDICIANNI; Giovanni Francesco SANTONASTASO; Simeone CHIANESE
Reference laboratory: Laboratorio di Idraulica e Idraulica Marittima
Innovative Technologies for Environment Protection from Pollution and Sustainable Resource Use
Tecnologie innovative per la protezione dell'ambiente dall'inquinamento e l'utilizzo sostenibile delle risorse – InnoTEP
Scientific manager: Dino MUSMARRA
Participants: Michele DI NATALE, Sante CAPASSO; Nicola SANNOLO; Andrea BUONDONNO; Adriana ROSSI; Maria Laura MASTELLONE; Armando DI NARDO; Pasquale IOVINO; Stefano SALVESTRINI; Simeone CHIANESE; Amedeo LANCIA; Evangelos Vasileios HRISTOFOROU; Marina PRISCIANDARO; Alessandro ERTO; Mauro CAPOCELLI; Immacolata BORTONE; Antonio MOLINO; Despina KARATZA; Giovanni Francesco SANTONASTASO; Davide SCAMARDELLA; Carmen DE CRESCENZO; Christos KONSTANTOPOULOS; Angela IOVINE; Antonia SCAMARDELLA; Angelo FENTI; Sanjeet MEHATIYA

Participation in research projects during the last three years:

Project title: DISABILITY, EXPERIENCE, AND ARCHITECTURE: TOWARDS SPORT AND LEISURE INCLUSIVE BUILDINGS
Scientific Responsible: Popovic Larsen, Olga
Partner Institutions: The Royal Danish Academy of Fine Arts, Innovation Fund Denmark, FORCE4 ARCHITECTS A / S.
Personnel involved: Kajita, Masashi, Cassi, Roberta Date: 01/10/2018 → 31/03/2022

Title of the project: 4H - Healthy, Human-centered and High-efficient co-living-working Homes
Scientific responsible: Sibilio, Sergio
Description of the research activity: The global health emergency caused by the spread of COVID-19 has impacted people's lifestyles and changed their perception and use of home and districts:

while relationships and places of sociality have been affected by requiring greater attention to social physical distancing, new needs and communication paradigms have emerged. Office working and teaching have faced this situation with widespread homeworking that has reduced the negative impact of the lock-down limiting people-to-people relationships to virtual communication.
Personnel involved: Group of reserch members;
Project status: *in corso di valutazione* Submission:
31 march 2022
Date: 24 months (2 years)

Title of the project: HABITAR LA "ISLA BLANCA". Interpretaciones de la arquitectura ibicenca
Coord.: Antonio Pizza
Personnel involved: Antonio Pizza (coord.), Gianluca Cioffi, Stefano Cortellaro, Isabel Feliu i Raimon Ollè, Carmen Rodríguez, i la participació dels estudiants del Doctorat en Arquitectura i Béns Culturals, Universitat Vanvitelli, Aversa.
Project status: completed: February 2024

Scientific products during the last three years:
10 scientific publications in Class A journals and/or indexed in the Scopus/WoS databases:

[1] PITZALIS E, RUSSO M, SCAGLIARINI N, "The talking garden. Distant dialogue with San Lorenzo ad Septimum", in *Abitare la Terra*, vol. 7-8, 2022, ISSN: 1592-8608, pp. 58-60;
[2] PITZALIS E, "L'estasi dell'oro", in *Dromos*, vol. 11, ISSN: 2239-6284;
[3] PITZALIS E, "Il mistero è chiuso in me", in *Dromos*, vol. 10, pp. 44-45, ISSN: 2239-6284;
[4] GAMBARDELLA, C, BOSSO, G, "Case a Chiaiano", in *Dromos*, vol. 11, 2024, pp. 20-25, ISSN: 2239-6284;
[5] GAMBARDELLA C, "L'insospettabile potenza dell'architettura miserabile", in *Vesper*, vol. 11, pp. 192-201, 2024, ISSN: 2704-7598;
[6] CERIANI SEBREGONDI G, "Baldassarre Peruzzi tra rilievo e progetto dell'antico. Baldassarre / Peruzzi Between Survey and Design of Antiquities", in *OPUS*, pp. 91-104, 2024, ISSN: 2532-7747;
[7] RUSSO M (2024). "Riscrittura come approccio progettuale. La casa secondo Mario Labò". *DROMOS*, vol. 11, ISSN: 2239-6284;
[8] KAIHOUL, A; PITZALIS, E; SRITI, L, "An Exploration of Climate-Responsive Design Strategies Employed by El-Miniawy Brothers in Southern Algeria", in *Journal of Sustainable Architecture and Civil Engineering*, vol. 36, 2024, ISSN: 2335-2000;
[9] PITZALIS E, BONANNO B, "Know how and Know how to do. Architectural design and theatrical biomechanics", in *Abitare la Terra*, vol. 59, n. 9, pp. 42-44, ISSN: 1592-8608;
[10] CERIANI SEBREGONDI, G; BULFONE GRANSINIGH, F, "Intorno a Giovanni da Udine. Circolazione di linguaggi e riferimenti all'antico. Around Giovanni da Udine. Circulation of Languages and all'Antica References", in *OPUS*, vol. 7, 2024, pp. 3-6, ISSN: 2532-7747;

Additional 10 scientific products:

[1] PITZALIS E, *Architettura come opera aperta*, DADI_PRESS, Aversa, 2022, ISBN 978-88-85556-19-5;
[2] PITZALIS E, "Alcune cose che so di Carlo", in AAVV, *Carlo Aymonino. Progetto Città Politica*, Quodlibet, Macerata, 2024, ISBN: 978-88-229-2063-8;
[3] RUSSO M, *VIKINGESKIBSHALLEN. Erik Christian Sørensen's Viking Ship Museum*, Libria, Melfi, ISBN: 978-88-6764-292-2;
[4] RUSSO M, "Principi permanenti e nuovi significati. La sede ACEA di Piazza Rosolino Pilo a Roma". In *BLOOM*, vol. 35, 2023, pp. 104-109, ISSN: 2035-5033;

[5] PITZALIS E, CIOFFI G, RUSSO M, SCAGLIARINI N, TARKALAM G, PETINO M, ZANCHETTA M, PAGANO LJ, TRUOSOLO M, "Via Terracina: un mosaico di memorie e architetture cinematiche". In *ProArch, Archeologia urbana e Mostra d'Oltremare*, Libria, Melfi, 2024, pp. 75-80, ISBN: 978-88-6764-350-9;
[6] RUSSO M, "Experiencing places of worship". In *XX International Forum Le Vie dei Mercanti World Heritage and Ecological Transition, Design for Health. ARCHITECTURE HERITAGE AND DESIGN*, Gangemi, Roma, 2022, pp. 303-312, ISBN: 978-88-492-4530-1;
[7] CIOFFI G, *Sperimentazioni e Progetti di Architettura*, Libria, Melfi, 2023, ISBN: 978-88-6764-297-7;
[8] CIOFFI G, SCAGLIARINI N, "Ibridazione tipologica", in Bartocci S (a cura di), *Transizioni. L'avvenire della didattica e della ricerca per il progetto di architettura*, ProArch, Rome, 2023, pp. 301-306, ISBN: 9791280379023;
[9] CIOFFI G, *Residenze collettive, tra ricerca e sperimentazione*, Clean, Napoli, 2022, ISBN: 978-88-8497-842-4;
[10] RUSSO M, "Il riuso dei materiali da costruzione. Risorsa e opportunità" In Tavoletta C (a cura di), *Architettura su Architettura*, LetteraVentidue, Siracusa, 2024, ISBN: 979-12-5644-007-8.

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

Project title: ADAPTIVE SURFACES IN ARCHITECTURE: MODELING AND EXPERIMENTATION ON PHYSICAL MODELS.

UniCampania scientific director: Efisio Pitzalis
Scientific director of the Danish Academy: Olga Popovic Larsen PhD student: Annarita Zarrillo
Year: 2020
Research Project: During the year 2020 a collaborative relationship began with the Institute of Architecture and Technology of the Royal Danish Academy in Copenhagen. This relationship has resulted in a doctoral project in line with the research conducted by this group. The doctorate in question is carried out in co-supervision between Professor Efisio Pitzalis and Professor Olga Popovic Larsen. The project focuses on the development of an innovative structural typology that makes the construction process simpler, faster, and more sustainable. These characteristics are obtained by studying the entire production process, from prefabrication with laser cutting machines to dry assembly on site. The research deals with the possible application areas of the system under examination, placing itself on the long line of kinetic and adaptable architectures.
Starting from the studies of Yona Friedmann and the Archigram group, passing through the inventions of Richard Buckminster Fuller and Frei Otto, a historical path is outlined that has adaptivity as its watchword.

Project title: DISABILITY, EXPERIENCE, AND ARCHITECTURE: TOWARDS INCLUSIVE SPORT AND LEISURE BUILDINGS
Scientific Responsible: Popovic Larsen, Olga
Partner institutions: The Royal Danish Academy of Fine Arts, Innovation Fund Denmark, FORCE4 ARCHITECTS A / S.
Personnel involved: Kajita, Masashi, Cassi, Roberta Dates: 01/10/2018 → 31/03/2022

Collaborations with Consortia, Scarl or other Institutions participated by the University of

Campania Luigi Vanvitelli during the last three years:
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ISI Web of Science Subject Categories:

Architecture;
Materials Science, Paper & Wood;
Green & Sustainable Science & Technology;
Construction & Building Technology;
Materials Science, Composites;
Industrial;
Urban Studies;
Regional & Urban Planning;
History;
Economics

Scientific-Disciplinary Sectors:

- CEAR-09/A (ex ICAR/14)
- CEAR-08/C (ex ICAR/12)
- CEAR-08/A (ex ICAR/10)
- CEAR-08/B (ex ICAR/11)
- CEAR-11/A (ex ICAR/18)
- CEAR-10/A (ex ICAR/17)
- CEAR-12/A (ICAR/20)
- CEAR-12/B (ICAR/21)
- ECON-07/A (ex SECS-P/08)
- IMAT-01/A (ex ING-IND/22)
- IIND-05/A (ex ING-IND/17)

Keywords:

Architettura
Strutture innovative
Edifici adattabili
Riuso adattivo
Digitalizzazione
Nuovi materiali
Industria 5.0
Pianificazione urbanistica
Logistica
Infrastrutture digitali

ERC Categories:

PE8_3 - Civil engineering, Architecture;
PE8_9 - Production technology, process engineering

PE8_10 - Industrial design
PE8_11 - Sustainable design
PE8_12 - Lightweight construction, textile technology
PE8_8 - Materials engineering;
SH5_6 - History of art and architecture, arts-based research;
SH2_9 Urban, regional and rural studies

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