

Types, codes, and algorithms for a perception centered design

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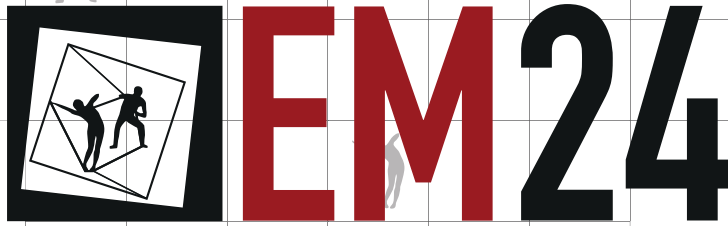
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EURAU - EUROPEAN RESEARCH ON ARCHITECTURE
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**IN-PRESENCE /
THE BODY AND
THE SPACE**

The role of corporeity in the era of virtualization

Edited by: Marco Bovati, Anna Moro, Daniele Villa

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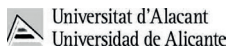
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The Department of Architecture and Urban Studies of the Politecnico di Milano organises at the School of Architecture Urban Planning Construction Engineering (AUIC), EURAU Milan 2024 "IN-PRESENCE / THE BODY AND THE SPACE - The role of corporeity in the era of virtualization", the eleventh edition of the international conference, which takes place from 19 to 22 June 2024.



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11th INTERNATIONAL CONFERENCE

EUROPEAN RESEARCH ON ARCHITECTURE
AND URBANISM INTERNATIONAL CONFERENCE

IN-PRESENCE / THE BODY AND THE SPACE

The role of corporeity in the era of virtualization

For those who deal with the city and the territory, space refers to the body
(C. Bianchetti)

The EURAU Milan 2024 Conference aims to unpack the significance of corporeality in contemporary times and its relevance for the upcoming years. Specifically, the focus is on the relation between body and space and how this relates to architecture, the city and the environment, interpreted as physical facts and processes. Within the background of a technological turn, the focus is now on what has changed or will further change in this relationship and what, on the opposite, remains unalterable, inherently bound to the material and impervious to the virtual.

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Spaces, Bodies, Design A Multidisciplinary Perspective

MARCO BOVATI, ANNA MORO, DANIELE VILLA

In an era in which many aspects of our society, lives, and disciplines are shifting - sometimes too lightly, others forcibly - from the physical to the immaterial, from the corporeal to the virtual, EURAU Milan 2024 Conference reflects on the current and future role of corporeality, examining what has changed and is changing, what is effectively irreducible from the material to the virtual intangible dimension and what, in terms of values and experiences, is gained or lost in this shift.

EURAU Milan 2024 solicits researchers and professionals in the spheres of spatial studies, from architecture to urban and environmental design, planning and policies, artistic disciplines and experimentations, etcetera, to reflect on the conditions/practices/tools that require the presence of a body or several bodies in a space, whether small or large, indoor or outdoor, in order to be lived, experienced and realised authentically, and if so, how this is different and why this is crucial compared to technologically mediated, non-corporeal, non-material, even non-human, experiences.

Considering diverse points of view and arguments, the perspective of corporeality appears intimately linked to architecture and urbanism in multiple ways and through the many approaches over time.

This vital link can be seen, for instance, if we consider the many perspectives from which space can be conceived: from the uses and the interpretations of space through 'practices', through a culturally-mediated perception of space, to the role of space itself as a source of sensory and environmental stimuli, to the production of space through design, or even to the social usability of space as a container of practices and events.

Following this perspective, the spaces of architecture, the city and the environment can be inhabited thanks to, by and through the body and its physical extension. The body is the transit of the relationship between design and space, practices and society. Placing bodies at the core of our disciplinary discourses means interfering with their material, organic and affective narrative, embracing their uncertainties and stumbles and dealing with the consequences. Bodies are traces of a creative multiplicity, interlaced with the possibility of an open and continuous dialogue with the world.

This multifaceted relationship occurs in two principal ways: one as 'acting bodies', bodies that touch, bodies that act, bodies as actors of practices and

actions, and as a tool for transformative reflection on space; and one as 'acted bodies', bodies as filters, bodies affected by the physical-spatial and environmental conditions of space. This dialectic between the body as an active medium and the body as passive exposure derives from Gilles Deleuze's reading of Spinoza and carries with it the idea that 'the body is the world, is made of the world, is at one with the world.'

Starting from the intention of investigating the space-body relationship, its modifications and resistances, the basic questions EURAU Milan 24 intends to ask are:

/ Is this condition still actual? How much has it changed, and will it change in the coming years?

/ What cannot change as it is effectively irreducible from the material to the virtual?

/ How has the body-space relationship changed with the advent of new technologies?

/ What still can a body do, and what can only be done by a body?

/ What is the added value of a body-centred approach to our disciplines?

The issue can be approached by questioning boldly a series of recent or well-known assumptions, which refer to different disciplinary fields but share a core theme: the co-presence and relationship of bodies in space.

Furthermore, in the current global conditions – full of innovation but with multiple crises that must be overcome through collaboration and research aiming towards a different future – researchers and professionals are driven to question even the fundamental traits of our disciplines profoundly. What the recent crisis, starting from Covid-19, has reiterated is indeed the centrality of the individual bodies and of bodies interacting in space.

Among the many emerging issues recently developed at the international level – for instance, the European Agenda or the international SDGs (Sustainable Development Goals), which points to sustainability, justice, equality, freedom, hospitality, health, a new and fairer economy, care for the most fragile people and territories, memory, beauty and socio-spatial transition – EURAU Milan 24 aims to underline and integrate the aspect of 'togetherness' that can be defined as being together, sharing practices and values through bodies and multiple, even non-physical bonds that occur within space.

The format of the conference is the result of a shared reflection that started with a research seminar on the current state of scientific events, held in March 2023 at Politecnico di Milano. As our network is based on a deep-sharing approach to research and design, we have identified a flexible format that includes both online and in-presence moments. The integration of modes has allowed us to promote a long-term format going from the summer of 2023 to the summer of 2024, called The Road to EURAU, which has engaged participants in bringing their contribution to the table and shaping the conference themes and contents.

We have proposed five preparatory thematic meetings organised by EURAU network partners to discuss this topic in advance. Each meeting introduced a different thematic approach to the conference topic. The outcomes of the meetings helped refine the thematic sessions of EURAU Milan 24 and the preparation of the open call. The aim was to activate an ongoing and wide-ranging discussion, fed by other forms of communication (a forum, an Instagram profile, a website), leading up to June 2024 as the final moment in which - IN-PRESENCE - we have met to draw conclusions.



The EURAU Milan 24 Conference addressed issues that delve into the tapestry of the relationship between body and space, framed and articulated within five thematic areas:

/CONCEIVED, /INTER-ACTIVE, /AFFECTED, /VULNERABLE and /AUGMENTED.

These five themes, as adjectives of the body as well as of the space, are intended as facets of a unique narration that is brought into focus through the exploration of each area. Cross-reading these themes provides a comprehensive lens through which to investigate the dynamic interplay and the multiple layers underlying the body-space relationship.

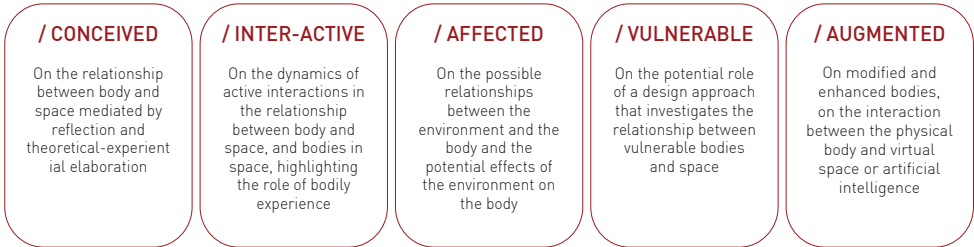
Specifically, **/CONCEIVED** anchors the exploration in the realm of reflective and theoretical-experiential elaboration and its foundations. Going beyond the notion of body-space relations grounded in proportions, measurements and geometry, there is an opening towards new forms of action, inter-action and reflection.

In the second session, contributions are asked to delve into the adjective **/INTER-ACTIVE**, which refers to the dynamics of active interaction in the body-space relationship, highlighting how movement, gestures, and sensory engagement contribute to craft a tapestry weaving together the materiality of space and the embodied experience.

The third theme, **/AFFECTED**, refers to the possible relationships and actions of the environment on the body, where the environment is understood as the artificial urban territory but also the natural and the natural and climatic domains. This thematic area underscores the profound impact of external factors on bodily experience.

/VULNERABLE bodily experience as well as climatic and natural consequences on space, points at the potential role of a design approach that investigates the relationship between fragile bodies and space. The session is dedicated to the manifold layers of vulnerabilities of bodies in space, and their role as a critical contribution to refocusing our disciplines.

The last thematic area, **/AUGMENTED** disciplines towards the design and reflection of inclusivity, is dedicated to modified and enhanced bodies and the interaction between the physical body and virtual space or artificial intelligence. It explores the evolving landscape of technologically mediated interactions, as well as contemporary art interventions.

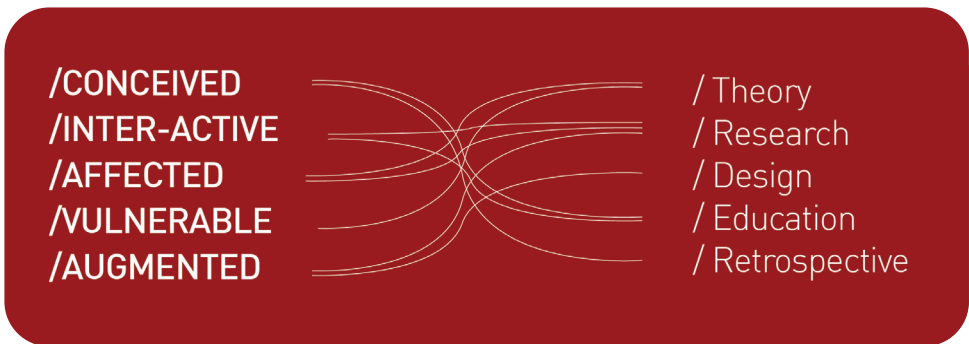


The thematic areas are intersected transversally by five operational perspectives: **Theory, Research, Design, Education and Retrospective.**

These propose five possible approaches that can also be combined within the same contribution.

The five approaches are based on the idea that the theme of the body-space relationship can be investigated according to different and interrelated modalities and perspectives, allowing for the various theoretical and practical experiences that characterise the activity of architects and urban planners, whether they operate as historians, theorists, designers, educators or professionals.

The thematic areas and transversal perspectives form a matrix where contributions can be freely placed.



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"Bodies, encounters, scenes. City assemblages and design strategies"

/RENATO BOCCHI, professor of Theories and Design of Architecture at IUAV University of Venice till 2019 and Director of Architectural Design Dpt. from 2006 to 2009. He coordinated the research program Re-cycle Italy, involving 11 Italian Universities (2013-16). He held lectures in Spain, Portugal, Argentina, Scotland, Ireland, Greece, and Slovenia. From 2015 to 2020 he promoted cultural initiatives among Iuav University, Ca' Pesaro Museum of Modern Art, and Querini-Stampalia Foundation. From 2019 onwards he is collaborating with the Doctorate Schools at Iuav Venice and Sapienza University of Rome. The dominant topics of his research and publications are the relationship between arts, architecture, city, and landscape. His most recent book: "Spazio arte architettura. Un percorso teorico", Carocci, Rome, 2022.

"Art And Architecture. Between Space And Body"

/CRISTINA BIANCHETTI, architect, PhD in Urban Planning, is full professor of Urban Planning at the Interuniversity Department of Regional and Urban Studies and Planning, in Politecnico di Torino, where she has also served as Deputy Dean. Her work focuses on themes related to living spaces and the critique of contemporary urban planning projects. Her presence in the cultural sphere is evidenced by her participation in and coordination of numerous research projects and by her many writings. Her latest books, "Corpi tra spazio e progetto" (Mimesis 2020 – English edition Jovis, 2021) and "Le Mura di Troia: lo spazio ricomponi i corpi" (Donzelli 2023), explore urban planning projects and their practices from a perspective centered on the body, revealing unexpected scenarios that emerge when the viewpoint shifts away from the actor, decision-maker, technician, or a legal or statistical entity, to that of a body that cannot be reduced to its abstractions.

"Insights for a theory of embodiment in urbanism"

/FRANCO FENOGLIO, a nuclear engineer at the Polytechnic University of Turin, he joined Thales Alenia Space (then Aeritalia) in February 1990, dealing with thermal and environmental control of spacecraft. In the late 1990s, he became Chief Engineer of the Nodes in ISS, leading "Nodo 3" until the integration and launch campaign in 2010. Subsequently, he started the Orion European Vehicle Service Module and managed exploration studies and advances. Today, he is Director of Human and Robotics Planetary Exploration, including Thales Alenia Space programs running for Artemis (lunar orbit and surface) and robotics to Mars. As part of his career, he has interacted with major Space Agencies (NASA, ESA, ASI) and major international companies.

"Beyond Earth. Thinking and designing solutions for humans in the (deep) Space"

1 / CONCEIVED

/ On the Body-Space relationship mediated by reflection and theoretical-experiential elaboration.

In recent years, architecture has shifted its paradigm regarding the relationship between body and space. This transition towards a new understanding of actions, movement, and experience has flanked – and partially replaced – the traditional emphasis on proportion, measurement, and geometry.

This evolution prompts a fundamental re-evaluation of how architecture, urbanism, and spatial practices conceptualise, theorise and practice the body-space relationship. To grasp the depth of this transformation, it is critical to delve into the historical modification of this relationship and the simultaneous, interacting, and at times conflicting, positions of contemporaneity. These perspectives encapsulate the past's legacy and lay the groundwork for future explorations.

The conceptual framework that underlies our understanding of the space-body relationship and its paradigms of reference, profoundly influences the design thought and process; it also informs our way of bodily inhabiting space through human and social practices. Therefore, thoroughly exploring this relationship's conceptual and creative dimensions and foundational principles is crucial.

Moreover, investigating the fundamental role of the space-body relationship also means recognising the multidisciplinary contributions that the world of culture and the arts have made to our subject area, where art, dance, cinema, theatre, and literature have played a fundamental role in reshaping our perception of this relationship in redefining its paradigms.

This session welcomes contributions which include but are not limited to:

- / The body as a system of proportion, measurement, and geometry;
- / The proxemics;
- / The space as actions, movement, and experience of bodies;
- / The mind and the perception of the space;
- / The body and the memory of the space;
- / Bodily project practice and technological innovation;
- / Architecture as a space device;
- / 'Spatial Design': the space, the body and the synthesis of the arts;
- / Contemporary Art: interventions on space and human perception.

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Types, codes and algorithms for a perception's centred design

Key Words

Type, Codes, Algorithm, Perception, Parametric

The Modern Movement was born with the rejection of rules and norms. These are the formal rules, the canons deriving from tradition, the classical canons and their Renaissance re-readings/rewritings. This rejection of the rules is exemplified by Le Corbusier's sketch in which a half-naked woman happily declares that "Vignola est foutu", to say that Vignola and his systematization of the classical orders in the form of geometric and mathematical norms was surpassed, outdated. The Modern Movement broke with the classical rules, of the rules concerning forms, styles and proportions, its flag, but at the same time it set as a crucial topic of dimensional norms, the *Existenz-minimum* which will then be origin of one of the major legacies of the Modern Movement, namely standards and building regulations. It could be argued that the only rules allowed in modern architecture are functional rules, therefore dimensional, quantitative, but one of the main manifestos of the time is a text which, using the term points instead of rules, states five points that allow us to define modern architecture and which are not dimensional elements, but formal, stylistic elements: the pilotis, the garden roof, the free plan, the free façade and the ribbon window. This reflection questions on the one hand what the role of rules is in contemporary design and on the other how much, and on the other the extent to which these rules include dimensional or perceptive parameters directly or indirectly linked to the users' bodies. To this end, the paper is organized around three compositional tools or techniques - type, coding and parametric design - which allow these rules to be read, written and finally informed. In this sense the meaning of the term "rules" is understood in the broadest sense as a possible rule, not given a priori, formulated with a logical process of abstraction on the basis of tradition and experience.

Type: reading the rules

The type is a concept aiming to read the invariants of the form, therefore the rules of morphogenesis. The most contemporary developments of the type try to use it to understand the rules of urban fabrics belonging to other cultures (Asia, Africa) and to try to forecast the evolution of fabrics not yet consolidated (slums, abandoned areas). However, for now, the type remains a disciplinary tool in the sense that it is focusing on the rules and invariants of pre-existing architecture and urban morphology. The morphological invariants that define types are often considered the reification of constructive, economic and cultural phenomena in a broad sense. It is interesting here to question the influence that the relationship between the human body and built space has had in the definition of architectural and urban types sedimented over the centuries. To which extent can we consider that consolidated urban types, such as the square or the street, have been configured not only following functional, social and economic phenomena, but also in accordance with the human perception they will be able to engender related to the space/space relationship Human Body? This topic of perception as a focus of the design process was already proposed by architectural scholars such as Auguste Choisy who explained, for example, the spatial composition of the Acropolis of Athens as strictly related to the visual effects that the layout of the buildings provokes. The essential role of perceptive phenomena as urban design tool has been more recently systematized in the studies of Gordon Cullen in the 1960s. With the urban design manual *Townscape*, Cullen explores the effects of the human movement in the perception of the types of urban spaces, stressing the effect that spatial relationships between the elements of the urban scene and the human body have. The perception is since then considered fundamental and essential elements in their urban space design.

Coding: Writing the rules

The recognition of urban and architectural types enables to identify possible conception rules, spotting invariants, it is then necessary to codify these rules and in particular those that relate the human body and space in order to make them operational, and sometimes normative, tools for the project. Coding is in fact the attempt to prefigure the development of territorial, urban and/or architectural form, through the development of a grammar, a set of elements and rules that constitute its syntax. Coding, contrary to type, does not aspire to read, to understand the form, but to regulate, to drive, its conception process and development. Architectural and urban types

Might be considered as a starting point for the urban and architectural design process. From then, coding aims to understand aspects of urban dynamics, even those that are not strictly disciplinary, such as the performance of the real estate market, fiscal measures, climate data and, last but not least, anthropometric data and perceptive phenomena, in order to integrate them into the conception of architectural and urban form. It is a system of written and designed rules, which express a political will, but also a cultural sensitivity, and which are placed as a fixed framework, within which designers must develop their project for the transformation of space. In this sense, Stephen Marshall's studies, focusing mainly at an urban level, identify three different types of codes: morphographic codes, morphological codes, and morphogenetic codes. Generally speaking, coding is built on identifying the project elements, then the mutual relationships and finally the steps of generation. The three orders of codes therefore provide different degrees of relationships, from the most implicit to the most explicit, to arrive at the deterministic relationships of morphogenetics. The high degree of subjectivity, that distinguishes the perceptive characteristics of urban spaces, suggests describing them through morphographic codes which, through their symbolic properties, ease the conception process based on properties that are reified in a multiplicity of forms and not in a single fixed and predetermined shape.

Parametric design: informing the rules

Parametric design consists of linking the final shape to a series of information, called parameters, through mathematical algorithms that express rules capable of managing the complexity of contemporary projects. These systems of rules are therefore not external to the project, but internal, and they are developed by the designers according to two possible different viewpoints or purposes. A first approach entrusts the algorithm that processes the project parameters with the task of prefiguring the shape of the transformation, this is the so-called form-finding process. The second approach, instead, uses the desired shape as a starting parameter, starting from which it is possible to discretize in a coordinated way all the sub-systems that contribute to the desired shape. The interest of both processes lies in the clarification of the system of rules and parameters and therefore in the possibility of intervening on each of them in full awareness, generating new configurations that maintain

the character of coherence and congruity with respect to the requirements (of form and function) expressed. In the case that interests us here, namely how to embed the perception of urban environments deriving from the human figure/urban space relationship into the design process, we are obviously interested in the form-finding process. Once again, form-finding process is not intended here as a deterministic process that leads to a single specific form, but as a process capable of providing the designer with formal schedules that satisfy the required perceptual needs.

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1 / CONCEIVED ENDNOTES

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Traditionally, humanistic culture has interpreted space through bodily analogy, to define the body not only as an aspect of proportions, measurements and geometry. Indeed, the body refers to space, and through it we inhabit it. However, through the body we create an “existential” space (Merleau-Ponty), because as phenomenological thought claims the body inhabits and applies to space and time it is “a means to a world”. The body is not just an object in space but is the point of view from which we perceive space itself. Even in Foucault’s structuralism, the constant relationship between the ‘I’ and the ‘body’ — I am where my body is — refers to an indissoluble bond with the space of which the body becomes a ‘fragment’, reiterated in its power by Barthes. It is a relationship of co-presence, but also of co-construction, as in the complex interactions between humans and non-humans (Latour). So spatial practices are shaped not only by human intentions, but also by material and technological dynamics, which can translate into a post-organic body as in Gordon Matta Clark’s experiments.

But also, the performing space becomes the place through which to explore the body-space relationship in innovative and profound ways, as in theatre-dance (Pina Bausch) or Kantor’s theatre. The theoretical reflection on the body, on the relationship with the soul (St. Augustine), overcoming that soul/body dualism (Galimberti), suggests that interaction with space is crucial not only for individual identity, but also for social categorizations and institutions, reflecting wider social norms and roles.

Based on these assumptions, the ‘conceived’ session brought together a myriad of wide-ranging reflections relating the discipline of architecture with a multidisciplinary interplay of theoretical and practical interpolations. By investigating the relationship body / space, several contributions highlight how architects can design spaces that not only embrace human activity, but also enhance and engage the human experience. In the practice as well in the academia, the body becomes a crucial tool and mediator to produce architectural knowledge. Moreover, from different angles, the examination of the voice of space itself, gives a deeper understanding of the embodied existence and the dynamic interaction between us and the world we inhabit. The intrinsic connection between the body and the built environment is investigated by referring to designers and theorists as a reference such as Hollein, who invited us to reconsider the ways in which we interact with the spaces, or the exploration of human perception by Carlos Martí Arís.