ASPETTANDO LA
NOTTE EUROPEA DEI RICERCATORI

Project Title:
Critical Theory and Practice In the Age of AI

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Doctoral program: Future Data 4 EU
Cycle: 40
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Background

The research explores how AI and data are reshaping architectural theory and practice.
It examines the evolving role of the architect in the context of digital agents and intelligent systems, focusing on critical theory, historical transformations, and the redefinition of design dynamics in contemporary architecture.

As part of this inquiry, the research will engage with the *Tabula Peutingeriana,* a Roman cartographic representation of imperial territory, to investigate how spatial imaginaries and territorial knowledge were historically encoded and visualized.

By analyzing this ancient map using contemporary data-driven tools, the study aims to identify parallels between past and present methods of mapping, governance, and infrastructural thinking.

This historical lens provides a critical foundation for understanding how digital technologies continue to shape perceptions of space, scale, and control in architectural discourse.

Project Goals

The research adopts an interdisciplinary methodology that combines theoretical analysis with data-driven spatial investigation.

It begins with a critical literature review to construct a conceptual framework grounded in philosophical anthropology and architectural theory. This is followed by the integration of digital tools, such as GIS and AI-based modeling, to analyze case studies and spatial configurations.

The approach emphasizes the interpretation of architectural environments through quantifiable data related to memory, perception, and human behavior, situated within historical context and technological mediation.

The findings will inform the development of adaptable design strategies that reflect both theoretical insights and empirical data, aiming to bridge conceptual understanding with practical innovation.

Experimental Approach

The research will follow a multi-phase, data-informed experimental approach that intersects architectural theory, digital humanities, and AI-driven spatial analysis. It begins with a critical historiographic study of architectural thought and territorial representation, starting from the *Tabula Peutingeriana* and focusing on the Roman Centuriatio system in Emilia-Romagna as a case of ancient spatial imagination and control. This historical cartographic artifact will be digitally mapped, georeferenced, and interpreted using GIS tools, allowing for a comparative spatial analysis with modern territorial and infrastructural systems.

In parallel, the project will employ AI-based modeling to explore how historical patterns of spatial governance are reflected in contemporary urban data, such as transport networks, land-use zoning, or digital mapping platforms (like Google Maps or GIS). A set of contemporary case studies will be selected based on their relevance to themes of control, mobility, and urban infrastructure, and will be analyzed using behavioral and perceptual datasets where available (e.g., memory recall studies, digital footprints).

To address the human-centered dimension, the research will incorporate data related to spatial memory, perception, and behavioral patterns, gathered through existing research or small-scale empirical tools (interviews, crowd-sourced mapping, or cognitive mapping methods). These will be critically interpreted through the lens of philosophical and architectural theory.

Ultimately, the approach aims to bridge theory and practice by generating a set of design and planning principles informed by both historical knowledge systems and current data regimes, thus contributing to a redefinition of the architect's role and responsibility in the age of AI and algorithmic governance.

Expected Outcomes

The research is expected to yield a set of theoretical insights and practical tools that critically address the evolving role of the architect in an era shaped by artificial intelligence, data systems, and algorithmic governance. By juxtaposing historical spatial imaginaries such as those encoded in the Roman Centuriatio infrastructure system in the territory of Cesena with contemporary data-driven urban infrastructures, the study will offer new frameworks for understanding how space, control, and mobility are conceptualized and operationalized across time.
Key outcomes will include:

- A comparative spatial analysis of historical and modern mapping systems using GIS and AI tools.
- A set of data-informed architectural and planning strategies that integrate human behavioral patterns, memory, and perception.
- A redefinition of architectural agency, emphasizing critical awareness, ethical responsibility, and data literacy in the design process.

For society, the implications are twofold. First, the research offers tools and insights that can enhance the design and governance of cities, making them more inclusive, responsive, and informed by both historical knowledge and contemporary data. Second, it contributes to broader societal debates around technological mediation, spatial justice, and the cultural responsibilities of architects and planners in shaping environments that are not only efficient but also humane and historically conscious.

SUSTAINABLE DEVELOPMENT GOALS

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