INCLUSIVE CITIES AND REGIONS
TERRITOIRES INCLUSIFS

14° Biennale of European Towns and Town Planners, Naples

Edited by
Marichela Sepe

#Parallel Workshop

INU Edizioni

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Parallel Workshops

7. NEW ECONOMIC APPROACHES, SUCH AS THE CIRCULAR ECONOMY

Coordinator: Luc-Émile Bouche-Florin
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Discussant: Vít Řezáč

Parallel Workshops

8. IT AND THE USE OF ARTIFICIAL INTELLIGENCE IN PLANNING

Coordinator: Adriano Bisello
Co-coordinator: Michele Grimaldi
Discussant: José María Ezquiaga

Cities and New Science: Challenges and Opportunities of AI in Planning

Paolo Fusero, Maura Mantelli, Lorenzo Massimiano***

The major global challenges that the 21st century is facing involve combating climate change and the applications (as well as the implications) of artificial intelligence on cities. The integration of Generative Artificial Intelligence (AI) into urban planning processes opens up very interesting research horizons to address challenges such as adapting to climate change and promoting social inclusion. At the same time, this new frontier raises specific questions: are optimistic views towards the contribution of AI in urban planning processes justified? Or is it wiser to be cautious, emphasizing the indispensability of human action, especially considering an ethical implementation perspective of new technologies? It is necessary to consider these questions to maximize the benefits of using artificial intelligence, particularly when applied to urban and territorial planning processes, finding a balance between optimism for its potential and awareness of responsibilities. Ensuring equity and public involvement in decision-making becomes crucial for effective change. For this reason, the analysis of case studies in various application fields of AI becomes important. Consider, for example, the development of "Virtual Singapore", a project where AI and 3D modeling were employed to create a digital replica of the city, the first digital twin of a country, initiated in 2012 and completed in 2023, aimed at evaluating governance strategies. This digital platform, developed by the Singapore Land Authority (SLA), offers an interactive and detailed three-dimensional model of the city-state. One of the most significant aspects of Virtual Singapore is its ability to integrate and analyze vast amounts of data from a wide range of sources, including IoT sensors, surveillance cameras, and satellite data. This allows urban planners and decision-makers to obtain a comprehensive and real-time view of urban dynamics, enabling them to make more informed and timely decisions. One of the main applications of Virtual Singapore is the simulation and modeling of urban scenarios. By utilizing advanced machine learning algorithms and artificial intelligence, it's possible to predict people's behavior, vehicular traffic, energy distribution, and much more. This allows testing different planning strategies and assessing their impacts before they are implemented in reality. Moreover, Virtual Singapore provides a powerful tool for actively engaging citizens in urban planning. Through an online platform accessible to everyone, residents can explore the virtual model of the city, propose ideas, and provide feedback on urban development proposals. This process of public engagement helps ensure that decisions reflect the genuine needs and preferences of the local community. However, despite its numerous advantages, Virtual Singapore is not without criticisms and challenges. One of the main concerns relates to data privacy and security. With so much sensitive information collected and processed, it is essential to ensure that strict data protection measures are adopted to prevent abuses or privacy breaches. Additionally, there is a risk that excessive reliance on technology could limit creativity and innovation in the urban planning process. The "DeepMind for Climate" project by Google also uses AI to improve long-term climate forecasts and formulate adaptation strategies. From research, we expect confirmation that artificial intelligence is not only a powerful technological tool but also a gateway to a paradigm shift in our development model, one that is more attentive to environmental issues. DeepMind for Climate represents an ambitious effort to use artificial intelligence in the fight against climate change. Based in London, DeepMind, a Google artificial intelligence company, has initiated this project to apply its advanced computational capabilities to the complex challenge of understanding and mitigating climate change. One of the main applications of this project is the use of AI models to analyze vast amounts of environmental and meteorological data. These models can provide more accurate climate forecasts, thus helping researchers and policymakers make more informed decisions regarding mitigation and adaptation. DeepMind is working to optimize energy efficiency in various sectors, including data centers, power grids, and cooling systems. By using machine learning algorithms, DeepMind seeks to reduce energy consumption and carbon emissions associated with these operations,

* University G. D'Annunzio, paolo.fusero@unich.it* University G. D'Annunzio, maura.mantelli@unich.it ** University G. D'Annunzio, lorenzo.massimiano@unich.it

Fig. 1.
Singapore Land Authority (SLA) - One Maps Virtual Singapore

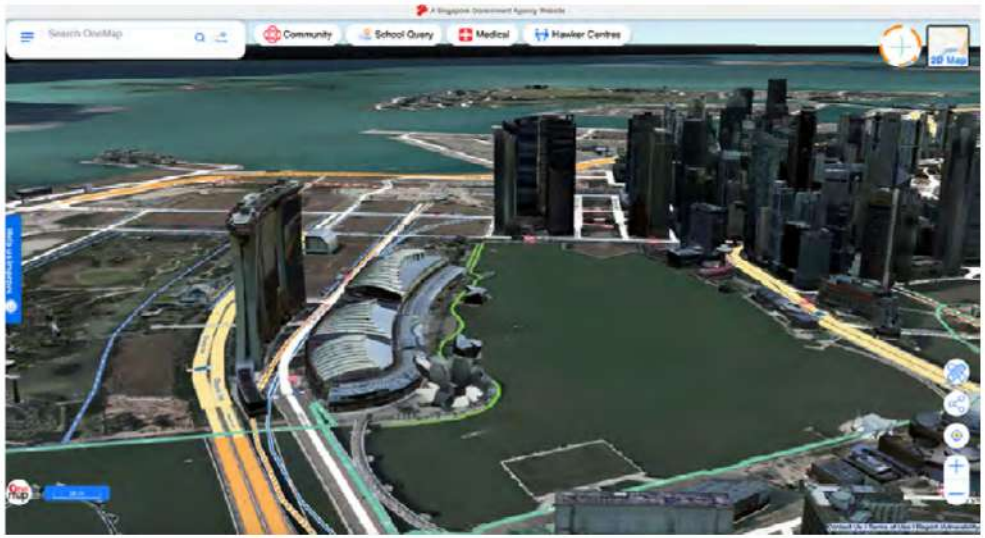
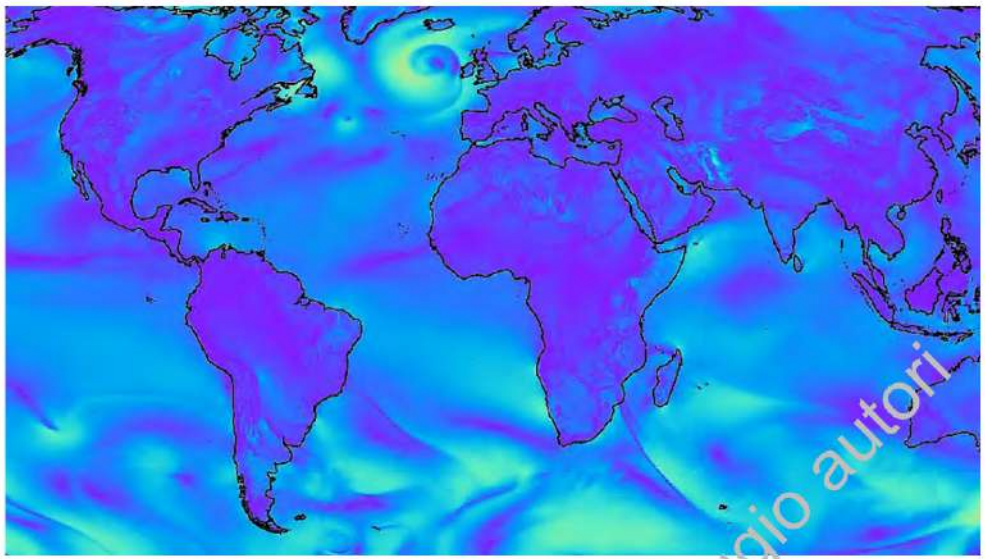


Fig. 2.
AI model for faster and more accurate global weather forecasting - Google DeepMind



thereby contributing to the overall reduction of the environmental impact of human activities. However, there are also challenges and questions associated with the use of artificial intelligence in the climate sector. Transparency of the models and algorithms used is crucial to ensure trust in the decision-making process. Additionally, it is important to consider the social and economic impact of the proposed solutions to avoid creating disparities or overlooking the needs of the most vulnerable communities.

The challenge for these models will be to rely on a "reliable" artificial intelligence, trained through intelligent systems themselves, that can support urban decision-making on environmental sustainability and climate adaptation. The responsible and strategic use of these technologies could revolutionize urban planning, enabling decision-makers and planners to adopt more computerized and targeted approaches, based on precise data and forecasts. However, to fully realize this potential, it is essential to ensure transparency, equity, and security in the proposed solutions, ensuring they meet the needs of communities and protect the environment for future generations. With collective commitment to research, development, and implementation of these technologies, we can hope to successfully address the challenges of climate change and build more sustainable and resilient cities. It is important to strike a balance between the use of digital technologies and the human approach to city design, taking into account the needs and aspirations of people. Proactively addressing challenges and criticisms is important to ensure that this technology continues to be a driver of innovation and sustainable development for the future of cities worldwide.

The Biennial of European Towns and Town Planners is an event of the European Council of Urban Planners ECTP-CEU which aims at discussing the main issues in the European debate relating to urban planning by sharing them with urban planners, architects, engineers, economists, sociologists, historians of architecture, citizens, politicians, private and non-governmental organizations (NGOs).
The theme chosen for the 14° Edition, organized from 22 to 24 April 2024 in Naples with the INU as the main organizer, is Inclusive Cities and Regions/ Territoires inclusifs. Inclusion is understood in its multiple declinations that define the 10 general themes of this Biennial - Regional issues and regional disparity, Metropolitan or city proposals, Urban regeneration and Public Spaces, Migration and cultural inclusion, Cultural heritage, Resilience and adaptation, New economic approaches, IT and the use of artificial intelligence in planning, Ports, airports and other infrastructures, Underground space – and in additional ones proposed by the participants who further specify the general themes namely About Spatial Inclusivity, Urban regeneration and spatial justice with Nature-Based Solution, Inclusive public spaces for water cities facing climate change, Italian UNESCO Chairs vision and actions, A Transdisciplinary Approach to Placemaking and Inclusivity: COST Action Dynamics of Placemaking, Inclusive city Ecosystems, Youthbanism for a New Generation of Urbanists, Fragile geographies. Visions, projects and studies to mitigate and adapt to environmental and anthropogenic risk, Green Oasis for the 15 minutes city model, Making/unmaking urban circular economies with 'otherness', Public space for inclusive cities: the Biennial of Public Space, Universal accessibility and university education, the knowledge network, Findings and Evidences from the PNRR project RETURN, and River Contracts as voluntary and negotiated planning tools.
The works contained in this Catalogue, presented by administrators, professionals, academics, and researchers concern projects, policies and research that have international interest and, at the same time, attention to the local, all at different scales.
It is possible, from this vastness of topics, to understand the broad discussion that resulted, outlining new interested subjects and involved actors, as well as new possible intersections of themes.

Marichela Sepe is Associate Professor at the DICEA Sapienza Università di Roma. She has also joined the ISMed-CNR and the DiARC-University Federico II. In 2013 she has been visiting Professor in the Peking University and held lectures in the Peking, Wuhan and Xi'an Universities. Her research interests include: urban design and planning; place identity; healthy city; livable public spaces; creative urban regeneration; multimedia. On these topics, she has published several national and international journal articles, conference papers, books and book chapters.
Currently she is Responsible of the Urban Impact Unit of the "SUMMA" PRIN 2020, and member of the COST Dynamics of placemaking, and Writing Urban Places. She is responsible of the Scientific Laboratory "Geodesign and Urbandesign" of LUPT University Federico II.
Sepe is President of the Biennial of Public Space Association, Vice President of INU Campania section and member of the national INU Governing Board, coordinator of the GUDesign network, member of the Eura Governing Board and member of Urban Design Group. In 2014-2023 she won: the Ardito-Desio Award for the paper presented at Ipsapa 2014, 2016 and 2018 Conference; the Urban Planning Literature Award of the Italian National Urban Planning Institute (INU) in 2014, 2015 and 2017 and the 2023 Horizon Europe Sapienza Award.

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