

IPAU²⁰ 24

3RD INTERNATIONAL CONFERENCE
ON ARCHITECTURE AND URBANISM

FUTUREFRAMES
AI IN ARCHITECTURE AND URBAN EVOLUTION

NOVEMBER 7-8, 2024 | PRISHTINA



UNIVERSITY OF PRISHTINA
FACULTY OF ARCHITECTURE

BOOK OF ABSTRACTS

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IPAU 2024

FUTUREFRAMES - AI IN ARCHITECTURE AND URBAN EVOLUTION

ABSTRACT BOOK

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FUTUREFRAMES – AI IN ARCHITECTURE AND URBAN EVOLUTION

3RD INTERNATIONAL CONFERENCE OF IPAU



Prof. Arben Hajrullahu
Rector of the University of Prishtina, RKS

FOREWORD

On this momentous day at the Faculty of Architecture, University of Prishtina, as we host the 3rd International Conference, “Frames of the Future: Artificial Intelligence in Architecture and Urban Evolution”, I am drawn to reflect on the concept of home—the house that shelters each of us.

We spend approximately 65 percent of our lives within the confines of our homes, a reality that speaks to the profound role they play in our existence. It is not surprising, then, that the phrase “The house belongs to God and the friend” holds a sacred place in Albanian culture, symbolizing the home's sanctity and its social significance. This reverence dates back thousands of years to when early humans, seeking refuge in caves, began to adorn the walls with drawings—primitive gestures to make these spaces warmer and, symbolically, to transform them into “homes”. Since then, the evolution of architecture has been a continuous endeavour to refine and improve our living, communal, and working spaces.

In Kosovo’s Dukagjin region, for example, traditional stone houses, known as *kullas*, once offered

protection and a sense of security, shielding families from external threats. These traditional structures speak to a history of adaptation, a testament to how architecture has responded to the needs of its inhabitants.

Today, we find ourselves at the intersection of tradition and innovation, where artificial intelligence is reimagining and reshaping our environments. Through AI-driven algorithms, we are now able to design spaces that optimize functionality, ensure safety, and even offer protection against natural disasters.

Yet, no matter how our global home—the Earth—or our individual residences transform in the future, I hope that amidst rapid technological advancements, we retain our essential humanity. To remain beings of flesh and blood, filled with dreams, plans, and courage, is perhaps our truest purpose, and it is through this lens that we might continue to find meaning in our homes and our lives.



Prof. Violeta Nushi
Dean of Faculty of Architecture, University of Prishtina, RKS

INTRODUCTION

On behalf of the Faculty of Architecture at the University of Prishtina and its International Platform of Architecture and Urbanism (IPAU), it is an esteemed honour to present the book of abstracts of the third International Conference – IPAU 2024, themed *FutureFrames: AI in Architecture and Urban Evolution*. This conference, held on November 7-8, 2024, provides a vital platform for academic discourse and professional inquiry into the profound intersections between Artificial Intelligence (AI) and the future trajectories of architectural and urban development.

The emergence of AI as a critical component in architecture and urban planning signals an extraordinary opportunity to transform our profession and scientific research. At a time when AI reshapes both theoretical frameworks and applied methodologies, it is imperative for academic institutions, practitioners, and policymakers to explore its impact comprehensively. The integration of AI in our field allows us to interrogate traditional design processes and cultivate solutions that address

both the challenges and aspirations of contemporary society.

FutureFrames stands as a stimulation for innovation, welcoming contributions that address six core thematic areas:

- Generative Design
- Spatial Analytics
- Biotechnology
- Human Health and Wellbeing
- Cultural Heritage
- Energy Efficiency

Each theme underscores an essential content of AI's role in our field, highlighting how AI-driven methodologies not only support but also enhance architectural and urban practices. As these themes reveal, AI has the potential to not only optimize efficiencies and environmental outcomes but also to foster an architecture that is deeply aligned with human needs and the demands of sustainable urban growth.

The abstracts within this volume represent a confluence of theoretical exploration and empirical research, each providing insights into the complex questions that AI presents for architecture: How can AI facilitate adaptable architectural frameworks? What synergies and tensions arise when AI intersects with human creative processes? In what ways can AI advance sustainable development, particularly in regions that are technologically less advanced? These contributions reveal a dynamic synthesis of human ingenuity and machine intelligence, guiding us toward a future where the built environment is as adaptable and resilient as it is innovative.

As we engage with the allowance presented here, we are invited to view AI not as a supplementary tool but as a transformative paradigm that can redefine the boundaries of architectural and urban thinking. This compiling of abstracts underscores our shared commitment to advancing knowledge, encouraging interdisciplinary exchange, and envisioning a future where AI actively contributes to creating built environments that are resilient, responsive, and future-ready.

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GENERAL NOTE

The Abstract Book is the preliminary version of the Abstract Proceeding Book to be published after the conference, which will be subjected to anonymous reviewers, including at least one external to the Scientific Committee. Thus, the texts published are the contribution of authors who confirmed

Sincere recognition to the organizing committee: Vlora Navakazi, Teuta Jashari Kajtazi, Arta Xhambazi, Dukagjin Hasimja, Miranda Rashani, Rozafa Basha, Arta Basha Jakupi, Florina Jerliu, Mimoza Dugolli, Ardita Byci Jakupi, Kaltrina Thaqi Cenaj, Rron Beqiri and Arta Zabërgja; special thanks to the Technical Organizing Committee: Teuta Jashari Kajtazi - General Coordinator, Ardita Byci Jakupi, Flaka Xërxa Beqiri, Rron Beqiri, Kaltrina Thaqi Cenaj, Arta Januzi Cana, Rinë Zogiani, Rrona Berisha, Vlora Aliu, Bora Kelmendi Beqiraj, Dasara Pula Hamza and Denis Dalladaku for their technical support for the preparation and coordination of the conference; and sincere thanks to the students: Olta Hasanaj, Dorina Gashi, Florian Shala, Argeta Zekaj, Leart Damoni, Blendi Leci, Aulona Sollova, Adea Ukimeri, Eneja Lajqi, Doruntina Sulejmani, Blerta Kaqorraj, Sihana Blyta, Diell Gashi, Art Berisha, Florian Popaj, Ari Nekoviqi, and Ajola Govori for their active contributions in technical support.

attendance at the Conference and are not subjected to the international criteria of double-blinded review from reviewers. The preliminary assessment is done by Scientific Committee, based on a review of whether the abstract is within an adequate topic proposed as a conference topic.

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INVITED SPEAKERS (ALPHABETIC ORDER)



Professor Amir Čaušević
Faculty of Architecture, Sarajevo | Bosna and Hercegovina
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Professor Amir Čaušević's profound impact on the field of historic structures is evident in his extensive body of work, which he began in 2000 with his master's on "Structural aspects of repair and reconstruction in case of masonry structure" and continued with his groundbreaking PhD on "Architectural and structural conceptions of sacral object's towers -Behaviour under atypical actions" by 2009.

Professor Čaušević's work has garnered international recognition, with him being the author of about 75 international and national papers, books, and chapters in books, primarily focusing on preserving and evaluating historic structures. His editorial work for the Hazards & modern Heritage International Conference in Sarajevo further solidifies his standing in the academic community. He is a respected Member of the ISCARSAH Committee, the

International Masonry Society -IMS, the Technical Committee BAS TC 58, and an Expert member of the International Council on Monuments and Sites – ISCARSAH(ICOMOS).

Professor Čaušević's leadership and mentorship in the field of historic structures is a testament to his influence. He has undertaken important tasks, contributed to international projects, and visited cities for training in professional interests: Berlin University, Stuttgart University, Trieste University, Istanbul Yildiz University, Jerusalem, Bari Politecnico, Ankara Middle East Technical University, Rome La Sapienza University, and Istanbul Technical University. He has been leading many graduate students and working on structural analysis of historic structures. He is an especially useful member for various sub-committees, organizing international groups, and collaborating with colleagues.



Ao. Univ. Prof. DI Dr. Andreas Voigt
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Ao. Univ. Prof. DI Dr. Andreas Voigt studied spatial and regional planning at TU Wien, where he was awarded a doctorate with distinction (sub auspiciis praesidentis) and was subsequently appointed Associate Professor of Local Planning.

His research and teaching activities focus on sustainable urban and regional development, inward and integrated regional development, and spatial simulation and its theoretical foundations.



Aziliz Vandesinde

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As a partner at RealVisuals, a company distinguished for its innovative approach to 3D surveying, Aziliz Vandesinde is part of a team of creative, down-to-earth experts. Their unique approach not only understands the benefits and opportunities of accurate data in construction and restoration projects but also the risks of oversimplified representations or excessive information. The chance to be creative (think alpinism!) and to utilize cutting-edge technologies (like SLAM, AI, or gaming engines) makes RealVisuals an ideal working environment for her!

As a guest professor at KU Leuven, she coordinates and teaches a highly specialized course on built heritage documentation. Through lectures and hands-on survey exercises, students gain knowledge and experience in documenting the reality of existing buildings and built heritage sites characterized by complex geometries, different layers of interventions, and changes in constructive systems.

How she got here... She graduated with a Master's in Conservation of Monuments and Sites from the Faculty of Engineering Science of the University of Leuven. She developed her passion for documenting heritage assets while interning at the UNESCO office in Amman (Jordan). In 2017, following four years of research on monitoring built heritage, she obtained her doctorate in Civil Engineering from the University of Leuven.

She successfully set up and coordinated several EU and international R&D projects throughout her career, demonstrating her ability to work in diverse cultural and geographical contexts. As the scientific coordinator of a 2.9 million euro H2020 project, she gained a wide variety of valuable skills for running and managing challenging projects and bringing them to a fruitful close for different donors, partners, and stakeholders. She learned the value of understanding the unique and specific needs of each heritage building or site by successfully carrying out projects and capacity building in the Middle East, Sub-Saharan

Africa, North Africa, South America, and the Western Balkans.

Like any “good” academic, she has presented her results at international conferences, published several articles, and edited books. She is also a

member of several active networks, e.g., the OurWorldHeritage committee for the transformational impacts of information technology. Throughout her journey, she has always been an ardent admirer of MOMO architecture, a passion that has enriched her professional life.



Clement Blanchet

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Clément Blanchet is a French architect, teacher, and critic who actively practices in the fields of architectural theory, urbanism, and cultural investigations.

He founded Clément Blanchet Architecture (CBA) in May 2014 in Paris after studying and living/working internationally for more than 15 years. The practice is structured as a laboratory, researching, informing, and generating architecture/urbanism in all its forms. In July 2017, Blanchet was appointed chief architect of the Annecy area (FR).

The office activity reflects the international experience: from being invited to international competitions in the USA, Asia, and Europe to designing a master plan and a hotel complex in Tbilisi (Georgia) and new urban development in Shenzhen (Asia) and Shanghai. In March 2021, Clément Blanchet Architecture was awarded winner of the International anonymous competition for the Sicilian Headquarter in Palermo (IT – with Leclercq and Laisné)

In France, the office has been focusing on education issues through several winning competitions: the Innovation Campus in Antony (FR) (2017) and the Carrefour Research And Development Center Saclay (FR) (2017). Recently, the agency won an international competition to create a 1,500-seat auditorium as part of the Grand Paris. In June 2019, CBA won the construction of the 15,000-seat new BAUER stadium in Saint Ouen (FR) with Scau. Clément Blanchet is leading Urbanist in charge of Metz urban development in METZ since 2020 (Zac Amphitheatre)

After studying architecture at the AA School of Architecture in London, the Chulalongkorn Mahawitthayalai Architectural School in Bangkok, and the University of Illinois in Chicago, he graduated with high honors from the Architectural School of Versailles. He started working at OMA in 2004, became an associate in 2008, and director of OMA France in 2011.

During his 10 years collaborating with Rem Koolhaas, Clement contributed to the development of OMA in France and led several winning projects for the firm,

including the construction of Serpentine Gallery in London, the design and construction of Caen Library (completed 2017), the design and development of winning entries like the Convention and Exhibition Centre in Toulouse (completed 2020), the Engineering school of Centrale (completed 2018), master plans in Saclay and Bordeaux, and lately the bridge Simone Weil over the Garonne in Bordeaux (to be completed in 2024).

Clement Blanchet has always been interested in the bridges between theoretical approach and pragmatism in architecture. He has been an invited critic to architectural schools in France, England, Holland, Denmark, and Sweden. He has taught at Taubman College since 2014 (Michigan, USA) and is currently at the Bauhaus (DIA—Dessau) and Paris Malaquais Architectural School (Paris).



Diellza Elshani

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Diellza Elshani is a lecturer, research group leader for knowledge graphs in architecture, and a doctoral candidate at the Department for Computing in Architecture (ICD/CA) at the Institute for Computational Design and Construction (ICD), University of Stuttgart. She holds a Master of Science in Integrated Urban Development & Design from the Bauhaus University of Weimar and a Bachelor of Architecture from Mimar Sinan Fine Arts University in Istanbul. Before joining ICD, Diellza was a researcher at the City Intelligence Lab (CIL) of the Austrian

Institute of Technology (AIT), focusing on cognitive urban design computing. She has garnered architectural experience in Germany, Austria, Turkey, and Kosovo. Diellza's primary research interest lies at the intersection of Symbolic Artificial Intelligence and Building Information Modelling, specifically focusing on knowledge graphs and Semantic Web technologies. She has over 10 publications on digital methods in the building industry, including conference proceedings and book chapters.



Florian Nepravishta
Polytechnical University of Tirana | Albania
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Florian Nepravishta is a professor of architecture and urbanism at the Polytechnic University of Tirana. He graduated in 1993 from the Architecture branch at the Polytechnic University of Tirana with very good results. He earned a second university degree in 2003 in Jurisprudence at the University of Shkodra with very good results. In 2002 he completed his Master of Science in Urban Housing Management at IHS – Erasmus University, Netherlands, and Lund University, Sweden. He has also completed postgraduate studies in the field of restoration and adaptation at the University of Florence in "Inner City Revitalization and Urban Renewal" at the Institute for Housing and Urban Development Studies-Rotterdam (IHS), Netherlands, and the European restoration school "Istituto per il Restauro dei Castelli", Udine-Italy. In 2009, he received the scientific degree "Doctor"; in 2013, he won the title "Associate Professor" and in 2016, he won the title "Professor" at the Polytechnic University of Tirana.

Professor Nepravishta has academic experience as a guest professor at several universities such as:

Albanian University (2009 -2015), UBT (2014 – 2015), State University of Tetova (USHT), North Macedonia (2010 – 2013), Politecnico di Bari (2016), etc. He is a member of the Doctoral College "Architettura, Disegno Industriale e Beni Culturali"(Ciclo 34, Ciclo 35) Università di Campania "Luigi Vivatelli", Dipartimento Architettura e Industrial Disegno, Italy and member of the Doctoral College "Progetto, conoscenza e salvaguardia del patrimonio culturale (XXXV ciclo). Università degli Studi Firenze, DiDA, Italy.

In addition, he has participated in various scientific conferences and published scientific papers such as articles, references, and monographs. His professional opus also includes organizing exhibitions, workshops (workshops), and International Conferences (IFAU17, IFAU18, and IFAU19). He has been a member of the scientific committee of over 40 international conferences. He is a member of the editorial board of several national scientific journals (Monuments), IKM "Technical Science Bulletin," UPT) and international scientific

journals ("Architecture and Urbanism," "South East European Journal of Architecture and Design (SEEJAD)," "Magazine of Civil Engineering," "JAS – SUT" Journal of Applied Sciences-SUT," etc.). Scientific director of the Forum for Architecture and Urbanism (FAU) colitis of the publishing house "La scuola di Pytagora editrice", Italy.

Various projects have marked Professor Nepravishta's professional journey as an architect. He has left his mark on the built environment, from residential to school, commercial to industrial, and tourist complexes. His expertise extends to restoring and rehabilitating existing buildings, interiors, and urban plans, showcasing his comprehensive understanding of the field.



DI Dr. Julia Forster
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DI Dr. Julia Forster is the head of the Spatial Simulation Laboratory (Simlab) at the Research Unit of Local Planning. Julia is an architect and spatial planner who focuses on digital planning and decision-support tools for resource-conscious development. In that context, she works on spatial data analysis and

holistic system visualization for agile collaboration of interdisciplinary experts within national and international research projects. For her PhD as part of the interdisciplinary doctoral college URBEM (development of robust scenarios for the future city of Vienna), she was awarded the Ressel Prize in 2017.



Michael Batty

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Michael Batty is a Bartlett Professor of Planning at University College London, where he is Chair of the Centre for Advanced Spatial Analysis (CASA). He has worked on computer models of cities and their visualization since the 1970s. He has published several books, such as *Cities and Complexity* (MIT Press, 2005), which won the Alonso Prize of the Regional Science Association in 2011, and most recently, *The New Science of Cities* (MIT Press, 2013). His blog, www.complexcity.info, covers the science underpinning the technology of cities, and his posts and lectures on big data and smart cities are at www.spatialcomplexity.info. His research group is working on simulating long-term structural change and dynamics in cities and their visualization. Before his current position, he was a professor of city planning and dean at the University of Wales at

Cardiff, and then, he was director of the National Center for Geographic Information and Analysis at the State University of New York at Buffalo. He is a Fellow of the British Academy (FBA), the Academy of Social Sciences (FACSS), and the Royal Society (FRS), was awarded the CBE in the Queen's Birthday Honours in 2004, and the 2013 recipient of the Lauréat Prix International de Géographie Vautrin Lud (generally known as the 'Nobel de Géographie'). This year, 2015, he received the Founders Medal of the Royal Geographical Society for his work on the science of cities. In 2016, he received the Gold Medal of the Royal Town Planning Institute and the Senior Scholars Award of the Complex Systems Society. He has Honorary Doctorates from the State University of New York and the University of Leicester.



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Professionals Activities: Roberto Cherubini established CSIAA (www.csiaa.it) in 1999, a design office intended as a think tank for architecture, urban, and landscape design. It can work out of the common Highline and accompany its design activity with individually structured public debates, research, and publications. Since 2000, when it was called in Hanover by Workshop Expo 2000, laying out a form for the sustainable future of the world fair field and buildings, CSIAA has worked innovatively, mixing the different design scales of landscape, town, and architecture. CSIAA_Docks Reloaded, the report on CSIAA projects on coastal design published in 2007, was presented in the same year at GSD Harvard.



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Vlasta Zanki graduated in 1998 from the Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb (Department of Thermal Engineering). She received her master's degree in 2002 from the Kungliga Tekniska högskolan - KTH in Stockholm, and from the same faculty, she received her doctorate in 2006 from the Department of Energy in the field of energy management and energy efficiency in buildings for tourist purposes. She has also improved her skills at specialist courses, seminars, and workshops in energy efficiency, energy management, green building, and project management.

She has not just participated, but significantly contributed to 6 scientific research projects and over 15 EU and international research and professional projects. As a manager, supervisor, or associate, she has played a pivotal role in over 50 professional projects in the Republic of Croatia, showcasing her ability to lead and manage effectively. She is the

author, co-author, or editor of 7 impactful publications.

From 1998 to 2007, Mrs. Zanki demonstrated her leadership potential as a junior researcher at the Department of Thermal and Process Engineering, Faculty of Mechanical Engineering and Naval Architecture. Her career continued as she was employed at the United Nations Development Program (UNDP), and from 2006 to 2008, she worked as a national consultant for HVAC systems. From 2008 to 2012, she led the Government Program 'Putting Your House in Order' through the national project 'Encouraging Energy Efficiency in the Republic of Croatia.' From May 2012 to April 2019, she served as the director of HEP ESCO d.o.o., after which she held the position of assistant director in the same company for two years. Since September 2021, she has been applying her leadership skills as an assistant professor at the Faculty of Geotechnical Engineering, University of Zagreb.

From 2015 to 2020, Ms. Zanki was the Vice President of the Board of Directors of the Croatian Green Building Council, and since December 2020, she has been the President of the Board of Directors. She participated in the establishment of the Croatian Association for Refrigeration, Air Conditioning, and Heat Pumps. Her career is a testament to her

unwavering dedication to developing and implementing efficient, green, and smart innovative systems and services that contribute to sustainable development, circular economy, and environmental protection, especially in the field of energy efficiency and energy management.

CONTENTS

FOREWORD.....	4	Integration of Natural Bio-Materials and Recycled Components for Building Facade Applications.....	45
INTRODUCTION	5	Interspace: AI, Public Space And Transnational Citizenship	46
ACKNOWLEDGEMENTS	7	Artificial Intelligence Technologies for Detailed Graphic Documentation of Existing Architectural Objects: Case Studies on Historical Buildings	48
ORGANIZER.....	8	Virtual Realities: Leveraging Ai From Video Game Design For Architectural And Urban Innovation.....	50
PARTNERS / SPEAKERS OF IPAU 2024.....	9	Designing with Heart: Integrating AI to Elevate the Human Spirit in Urban Evolution	51
SCIENTIFIC COMMITTEE OF IPAU 2024	9	The Impact of Ring Roads on Urban Growth Patterns: An Agent-Based Modeling Approach	52
INVITED SPEAKERS (alphabetic order)	12	AI applications in biotechnology in hazardous waste management: A case study of industrial plants located in Mitrovica.....	53
How Does Information Technology Transform the Design Process, architectural Planning, and Management?	34	Gaudi Unmasked: AI and the Paranoiac-Critical Method to Go Beyond Hidden Depths	54
“Earthing”- Toward Urban Wellness.....	35	Artificial Intelligence as a Catalyst for Urban Development: Insights from PrishtinAI.....	55
Enhancing Environmental Analysis and Optimization in Architectural and Urban Design: Integrating Advanced Computational Methods in Rhino/Grasshopper.....	36	The Role of AI in the Evolution of Designing	56
AI for Comfort: Enhancing Occupant Satisfaction through Personalized Comfort Models in Highly Automated Building Control Systems	37	Artificial Intellegence (AI) Towards the Sustainable Development of Intellegent Buildings – Project Proposal for The Administrative Buiding in Prishtina.....	57
Prishtina as a city of virtual realm – Metaverse.....	38	Author Index.....	59
Designing per Human request	40		
Artificial Intelligence And the praise of slowness	41		
Reading, Modelling and Editing Urban Form.....	42		
Pedagogical Reflections on The Usage of Innovative Architectural Language As A Problem-Solving Strategy For Contested Heritage And Invasive Aesthetics In Tirana.....	43		

HOW DOES INFORMATION TECHNOLOGY TRANSFORM THE DESIGN PROCESS, ARCHITECTURAL PLANNING, AND MANAGEMENT?

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ABSTRACT

In a rapidly evolving technological world, the role of information technology (IT) in architecture has become increasingly crucial. IT serves as a key tool for optimizing the design, planning, and management of architectural projects, offering new opportunities for creativity and efficiency. This study explores how IT, through specialized software, 3D modeling, and project management applications, has transformed traditional architectural practices.

The research focuses on the significant changes IT has brought to the ways architects and construction professionals design, develop, and manage projects, enhancing efficiency, precision, and collaboration. By

analyzing these technologies, this research aims to provide a comprehensive understanding of IT's impact on contemporary architecture, highlighting both the advantages and challenges of its integration. Ultimately, this review underscores how IT is paving the way for innovation, sustainability, and high-quality outcomes in the construction of smart architecture and cities.

Keywords: Information Technology (IT), Architectural Design, Virtual Reality (VR), Argumented Reality (AR), 3D Modeling, Construction Efficiency.

Topics: Generative Design: software, process, and design alternatives, management efficiency.

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“EARTHING” - TOWARD URBAN WELLNESS

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ABSTRACT

In the times we are living in, as human intelligence continuously merges with machine intelligence, it is essential for professionals to find ways to coexist effectively.

"Earthing," used here as a metaphor, highlights parallels between the human grounding effect (in the context of site analysis) and the way AI systems rely on data and connectivity to function effectively. Emerging as a transformative tool for urban designers and planners, AI-powered algorithms can analyse vast amounts of data related to urban environments. While AI excels in objective data processing, handling large datasets quickly and accurately, and offering quantitative assessments or running complex simulations to predict the impact of various design choices, architects bring a wealth of experience and intuition to site analysis. This allows them to interpret subtle cues and understand the nuanced implications of a site's features. Architects adopt a holistic view, considering a range of factors, including aesthetics, cultural significance, and historical context, often within a broader urban or environmental framework. Their creative vision and conceptual thinking enable architects to transform spaces to meet human needs

and aesthetic goals. Their artistic skills allow them to visualize designs and modifications, considering the emotional and experiential impact, and thus providing a comprehensive human-centered analysis that reveals sensory design.

The "Earthing" approach to site analysis thus explores how the synergy between human-inspired practices and advanced technological tools like AI can shape urban environments that promote holistic well-being and sustainable living. It advocates for a paradigm shift towards designing cities that nurture both the physical and emotional health of their inhabitants, setting a new standard for urban planning in the 21st century. Ultimately, "Earthing" champions a harmonious coexistence between architect and AI, emphasizing the transformative potential of reconnecting with the Earth for healthier, happier urban living.

Keywords: “Earthing”, Approach, Human, AI, Urban Wellness

Topics: AI and the Human- senses, health, and wellbeing

ENHANCING ENVIRONMENTAL ANALYSIS AND OPTIMIZATION IN ARCHITECTURAL AND URBAN DESIGN: INTEGRATING ADVANCED COMPUTATIONAL METHODS IN RHINO/GRASSHOPPER

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ABSTRACT

In the realm of sustainable architecture, it is crucial to assess and adapt to environmental conditions. This study delves into how three tools—Ladybug, Honeybee, and Eddy—are utilized in the Rhino/Grasshopper platform to enhance environmental analysis and optimization in architectural and urban design. These tools collectively empower architects and city planners to make data-based decisions that improve energy efficiency, occupant well-being, and overall sustainability.

Ladybug, a robust environmental analysis plugin, allows for the integration of EnergyPlus Weather files (.EPW) into Grasshopper. It offers a variety of 2D and 3D views that support decision-making regarding climate and other factors such as sunlight, heat, and passive strategies. Ladybug also reduces the number of calculations needed, helping designers understand data and integrate it into their designs.

Building on this foundation, Honeybee has been developed to perform energy modeling and daylighting simulations using EnergyPlus engines, Radiance, and Daysim. This plugin enables evaluations of energy efficiency and indoor environmental quality, guiding designers to make

improvements in building designs that enhance performance and comfort. By integrating with Grasshopper’s design tools, Honeybee facilitates testing and immediate feedback during the design process for improved precision. Eddy adds to this toolkit by focusing on wind pattern and microclimate analysis. Using computational fluid dynamics (CFD), Eddy simulates airflow around structures and urban areas, offering insights on wind comfort, natural ventilation, and reducing urban heat islands. These functions are essential for creating spaces that are comfortable in thermal terms and energy efficient.

The collaboration of Ladybug, Honeybee, and Eddy in the Rhino/Grasshopper framework represents a significant advancement in sustainable architectural practice. This paper demonstrates how architects can achieve high-performance designs that respond to their environmental context, ultimately promoting sustainability and resilience by integrating advanced environmental analysis into the core of the design process.

Keywords: Environmental analysis, Computational tools, Data-driven design

Topics: Energy efficiency and sustainability: performance, integration, and optimization

AI FOR COMFORT: ENHANCING OCCUPANT SATISFACTION THROUGH PERSONALIZED COMFORT MODELS IN HIGHLY AUTOMATED BUILDING CONTROL SYSTEMS

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ABSTRACT

The drive for better building energy performance has led to increased automation levels in control systems, especially in commercial and academic buildings. However, this shift has often resulted in reduced user satisfaction with the indoor environment for two main reasons: occupants cannot adjust conditions to their needs, leading to discomfort, and the lack of control can cause psychological dissatisfaction. Since buildings are ultimately designed for users, it is essential to move from technology-oriented to user-oriented control systems. This shift has prompted the development of human-centered control systems, which prioritize user preferences by incorporating them into automated control algorithms.

By gathering occupant feedback on their perceptions and needs, AI can be used to create Personalized Comfort Models (PCMs) that tailor indoor environments to enhance user comfort. These PCMs, developed using data-driven machine learning techniques, predict comfort levels based on self-reported perceptions via IoT devices or smartphones, along with simultaneous indoor sensor measurements. This presentation will discuss two case studies demonstrating the effectiveness of PCMs.

The first case study is a laboratory experiment in a faculty office in Zagreb, Croatia, involving four participants over three weeks. The second is a field study in a smart high school building in Zagreb, Croatia, with 24 participants over two weeks. The results highlight the predictive performance of the developed PCMs and their integration into building control systems to regulate indoor environments based on user preferences. These findings are significant, as they represent some of the few field studies involving actual building occupants in human-centered control systems, demonstrating how data collected from both individuals and buildings can be leveraged to develop AI models that enhance occupant comfort and satisfaction.

Keywords: Human-centered control systems; Smart buildings; Artificial Intelligence; Machine learning; Personalized comfort models; Indoor comfort; Occupant satisfaction.

Topics: Building energy performance, personalized comfort models, Field Studies in Human-Centered Control

PRISHTINA AS A CITY OF VIRTUAL REALM – METAVERSE

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ABSTRACT

AI and the Metaverse are impacting architecture and urbanism, enabling numerous design capabilities and creating new possibilities for exploration and practice. The aim of this study is to explore the practical applications of AI in architectural and urban processes within the context of the Metaverse by examining how AI technologies are reshaping design processes, making them more efficient and manageable, improving design outcomes, and redefining the boundaries of traditional practice. This paper was developed as part of the course “Art, Culture, and Technology.”

The theoretical groundwork includes a review of literature on Artificial Intelligence, the Metaverse, architectural and urban processes, and more, from a variety of sources. The literature was analysed to understand its impact on art, architecture, culture, and technology; how AI technology functions, the software used to generate images, and how architects create and implement designs in virtual reality.

A case study focused on the city of Prishtina demonstrates the use of AI technologies to generate visualizations of how the city might appear in the Metaverse. These visualizations illustrate the

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potential transformation of Prishtina's architectural landscape within a virtual context and show how AI can enhance design processes and outcomes. Parallel to this, the AI-generated visualizations are presented alongside traditional visual representation methods, highlighting the various possibilities offered by AI technologies. The AI visualizations were generated using D5AI visualization software.

The results of the study indicate that AI is reshaping architectural and urban design processes, revolutionizing the way we conceptualize, design, and interact with virtual environments. Through AI-

generated algorithms, architects can optimize design processes, create numerous innovative solutions, increase sustainability, and explore unconventional design concepts, thereby pushing the boundaries of creativity.

Finally, the study addresses the ethical and cultural limitations associated with using AI.

Keywords: Artificial Intelligence, Metaverse, Architectural Design, Urban Design

Topics: AI in Architecture and Urbanism, the Metaverse and Virtual Design

DESIGNING PER HUMAN REQUEST

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ABSTRACT

This research highlights the potential of Artificial Intelligence in architectural practices, with a focus on human-centered AI tools. Complex design tasks have been redefined through data interpretation practices, enabling a deeper and faster understanding of external data. This study outlines improvements in functionality, sustainability, and aesthetic value within the design process, with particular emphasis on the practical applications of these advancements. Ongoing research explores how to integrate new practices, such as AI, with traditional problem-solving methods. This approach eases the demand on human input by allowing human-guided decision-making that is heavily based on professional knowledge and experience.

Overall, despite advancements, these tools must have a comprehensive understanding of the architectural realm to enhance and support design processes effectively. Developing countries, such as Kosovo, which have less data available online compared to other cases, can currently utilize only a limited percentage of AI's potential capabilities in design facilitation. Therefore, augmenting human skills and creativity with advancing technological capabilities ensures more contextually relevant design solutions.

Keywords: Decision Making, human design, simulation, data

Topics: AI and the Human: senses, health, and wellbeing/ Energy efficiency and sustainability: performance, integration, and optimization

ARTIFICIAL INTELLIGENCE AND THE PRAISE OF SLOWNESS

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ABSTRACT

Artificial intelligence is about being capable of controlling pre-existing technologies and favouring new types of intelligence. Artificial intelligence should target and coordinate data to reach a new intensification—what I would call "augmented intelligence." Should we still learn through failure, or should we coordinate artificial intelligence knowledge? What impact does this have on architects' thinking?

I believe intelligence is about understanding where knowledge is located. Artificial intelligence should help us find this knowledge in a structured and exhaustive way. While AI can provide us with data, it cannot offer qualitative strategies. Only humans are capable of curating this knowledge.

Architects should take the time to think, observe, and decide. In fact, new technologies and embedded AI should encourage us to slow down. We should use fast tools to slow down, to think more deeply, to strategize, to compare, and to enrich a context.

No one understands and translates local and contextual reasoning better than humans. Artificial intelligence is powerful and essential; it must constantly improve. But humans will curate real life, curate data, and create architecture.

While AI allows architects to integrate global awareness, one of the main responsibilities of those who design is to amplify and coordinate local needs. AI might accelerate certain processes, but it should emphasize slowness to improve thinking, building, and strategy. Artificial intelligence is not a solution— it is a tool.

Architects are the doctors of the soul.

Keywords: intensification, speed, technology, local, global

Topics: Urbanism, Architecture and technologies

READING, MODELLING AND EDITING URBAN FORM

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ABSTRACT

From the 1950s onwards, cities have increasingly been recognized as complex systems, represented as sets of integrated subsystems and their elements. More recently, researchers have used Artificial Intelligence to develop tools and methodologies for analysing, modelling, planning, and managing urban spaces, with the aim of creating more informed, efficient, and responsive design strategies.

The goal of this research is to connect this understanding of cities to the concepts of scale, relationships, and simulation of urban forms and functions. In this case, AI, following a semantic structure—what Christopher Alexander might describe as a pattern language—can offer methods for reinterpreting existing urban forms to simulate their current functioning and predict their future development.

This research addresses the reproduction of urban spaces through processes of modelling and editing, while examining changes in urban morphology. The study focuses on theories and principles for analysing and interpreting existing urban areas, which, due to

specific socio-political factors, have been left incomplete or interrupted in their spatial formation. The objective is to model the voids—left by these interruptions—in relation to the solid spaces by reinterpreting Nolli's map of Rome and Ungers' conceptualization of Berlin, within the framework of AI-driven methodologies for spatial analysis.

In this context, how should we—if at all—use AI? Can AI understand a city and its morphological peculiarities and design it, or is it simply a tool that offers contemporary methods for projecting future scenarios in urban areas that require editing? This paper thus explores the impact of AI when applied to urban morphology, considering perspectives like the "wired brain," "Neuralink," and the "Internet of Things" within the perception of future urban scenarios.

Keywords: Urban Planning, Urban Form, Modelling, Editing

Topics: Spatial Analytics; AI and the Human

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PEDAGOGICAL REFLECTIONS ON THE USAGE OF INNOVATIVE ARCHITECTURAL LANGUAGE AS A PROBLEM-SOLVING STRATEGY FOR CONTESTED HERITAGE AND INVASIVE AESTHETICS IN TIRANA

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ABSTRACT

This study reflects on the use of innovative digital technologies among 5th-year architecture students at Epoka University within the framework of a course focused on advanced contemporary design theories. It elaborates on the course's assignment outputs, which encourage students to apply innovative design language from contemporary architects and artists who emerged after Modernism, such as those using deconstruction or parametric design. The assignment's context includes sites of contested heritage and invasive aesthetics within the urban and architectural landscape of Tirana.

Within this framework, students were asked to rethink, reconceptualize, and reshape potentially problematic buildings and spaces in Tirana using new architectural solutions or language. They were encouraged to apply the innovative architectural approaches learned in the course as design tools. Since this assignment is exploratory, experimental, improvisation-based, and creatively oriented, students were not always required to produce

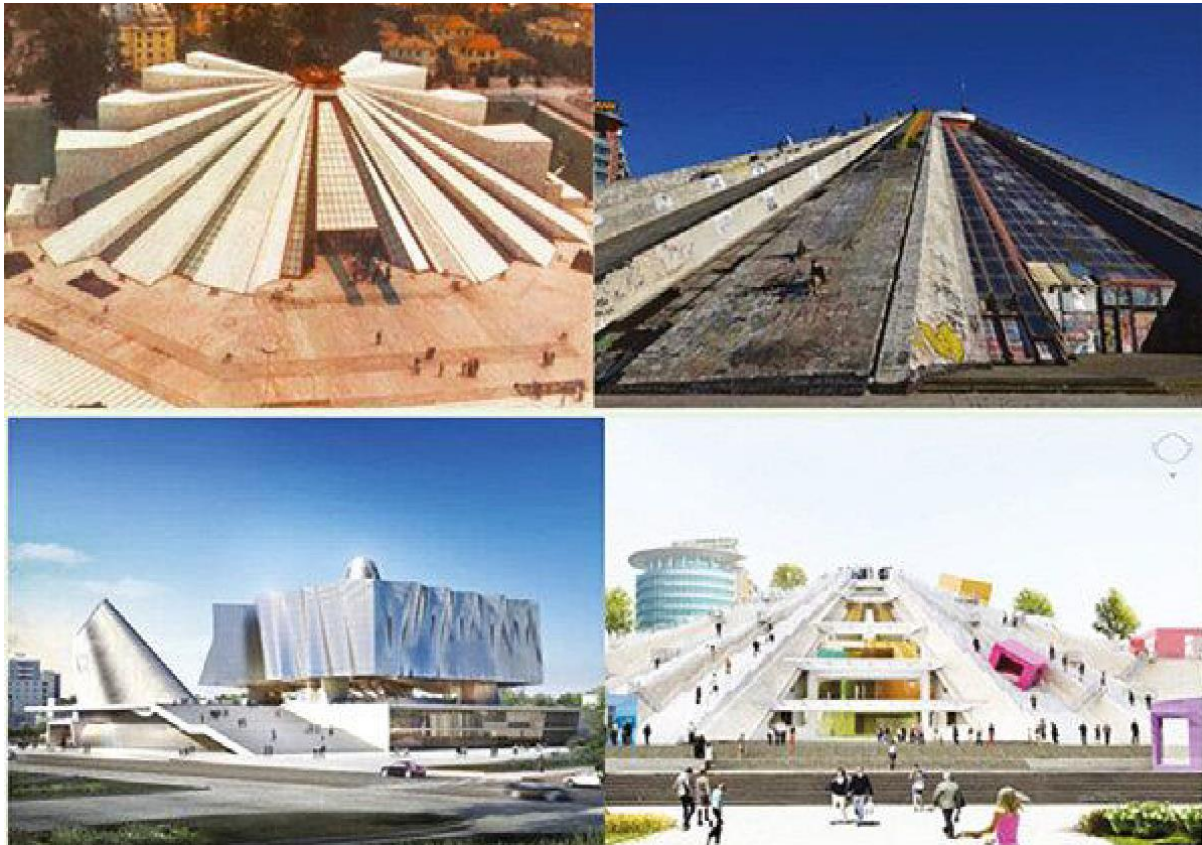
technical drawings. Instead, they conveyed their ideas through various visualization techniques, collages, and sketches organized into a poster. Alongside these visual materials, students were also asked to provide an extended abstract, where they described their design process, including ideas, programs, technologies, materials, adaptability, and social and cultural factors that reshape the problematic building or public space. Furthermore, the design thinking and process were illustrated using a conceptual map, which integrated all relevant concepts.

This study offers valuable pedagogical insights for lecturers in understanding the potential and limitations of such innovative design language. While innovative design languages provide opportunities and benefits, such as fast architectural visualization and a multiplicity of design alternatives, a significant challenge remains their adaptability to the local context. Additionally, a primary concern with digital technologies is their potentially negative impact on the creative, cognitive, self-immersive process.

Keywords: Pedagogical Reflections, Innovative,
Digital, Architectural Language, Contested Heritage

Topics: Generative Design

Figure/Table:



INTEGRATION OF NATURAL BIO-MATERIALS AND RECYCLED COMPONENTS FOR BUILDING FACADE APPLICATIONS

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ABSTRACT

The building facade represents the primary interface between a structure and its interaction with humans and nature, reflecting the building's character. When designed according to sustainable practices, it significantly impacts environmental conservation and energy efficiency. This study, a component of a doctoral dissertation, explores the potential of bio-based and recycled materials for creating facades that harmonize with nature and contribute to sustainable construction.

Focusing on a composite made from clay, sawdust, and slag, this research evaluates these materials as viable options for building facades. Such a product must meet several key parameters to be suitable for facade applications, including durability, thermal efficiency, water absorption, and resistance to mechanical forces, among other factors. Additionally, it is essential that these materials integrate well within their chemical structure to form an effective and recyclable bio-product.

The research employs analytical, synthetic, statistical, and generalization methods. Experiments were conducted both in the field and in laboratories, encompassing analyses of bio-materials, their combinations, existing facade studies, and laboratory testing.

In conclusion, this study presents an opportunity for the construction industry to adopt a new product with the potential to contribute to environmental conservation and energy efficiency, thereby enhancing building sustainability and promoting greener construction practices.

Keywords: Biomaterial, Sustainability, Efficient Energy, Clay, Façade

Topics: Biotechnology; Energy efficiency and sustainability

INTERSPACE: AI, PUBLIC SPACE AND TRANSNATIONAL CITIZENSHIP

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ABSTRACT

On May 8, 2024, the launch of a portal connecting two global cities, Dublin and New York, marked a pivotal moment in the evolving narrative of human connectivity. In an era where the boundaries between the tangible and intangible are increasingly blurred, this project—a synthesis of avant-garde technology and futurism—challenges the concept of physical public space by creating bridges across the Atlantic and offering new paradigms for public space.

This paper builds on Saskia Sassen’s theory of globalization and transnational citizenship, which argues that globalization has challenged traditional notions of citizenship historically tied to the nation-state. Through an analysis of the portal, we explore how artificial intelligence (AI) can reimagine new forms of transnational citizenship and extend public space into the virtual realm, reflecting Sassen’s ideas on the strategic importance of cities in the global landscape.

To further explore the role and capacity of AI in shaping and enhancing virtual public spaces, we propose a hypothetical portal between Prishtina, Kosovo, and a European city to examine AI’s role in transnational citizenship. Using impact assessment (IA), we will employ AI tools such as machine learning and natural language processing to analyse demographic data, cultural exchanges, social media interactions, mobility trends, surveys, and policy impacts. This study aims to understand the dynamics of citizenship and public space between regions with different levels of development. By gathering and analysing this data, we aim to gain insights into how AI can transform virtual public spaces and transnational citizenship.

Keywords: portal, Saskia Sassen, citizenship, public space, globalization

Topics: Spatial Analytics (data, patterns, trends, and connections)

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Figure: The portal by Daily Mail



ARTIFICIAL INTELLIGENCE TECHNOLOGIES FOR DETAILED GRAPHIC DOCUMENTATION OF EXISTING ARCHITECTURAL OBJECTS: CASE STUDIES ON HISTORICAL BUILDINGS

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ABSTRACT

The need for detailed graphic representations of various objects arose in the first millennium after the post-Neolithic era when humans found it necessary to reproduce organic and non-organic structures graphically. They initially depicted these structures on mural surfaces and, later, on ancient papyrus sheets during antiquity. This interaction with graphical representation served many purposes, from preserving significant moments and enhancing recognition of nature's superior forces to facilitating control over space for personal well-being and strengthening trust in dedicated cult objects. Over time, the demand for personal and collective well-being increased, requiring increasingly sophisticated graphic documentation. The trend of detailed graphic documentation grew over millennia in proportion to the need for rapid documentation.

With the advent of advanced technologies, such as artificial intelligence, point cloud geo-referencing, matrix calculations, and 360-degree laser scanning, this trend has accelerated significantly. This research article addresses three main questions:

What technological advances currently exist in terms of detailed AI-driven graphic documentation? How do these technologies enhance qualitative assessment and accuracy? And, how do they affect the speed of data generation?

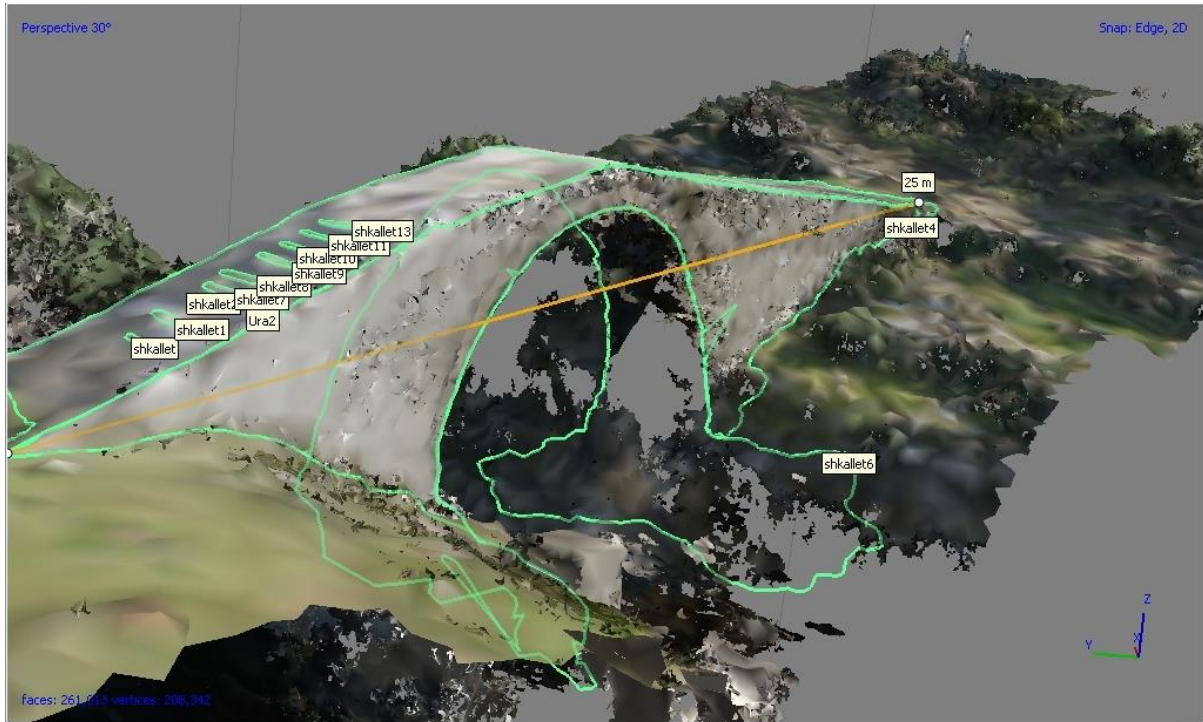
Using aerial stereoscopic photogrammetry techniques on specific research projects, this article also presents meta-shape data conclusions on survey impacts through four qualitative case studies. These case studies involve the graphical documentation of cultural historical monuments in Albania, including the medieval bridge in Tirana's Brar village, the archaeological area of Krujë Castle, the former residential building of Bajram S. Xhani in Kavaja city, and the Church of Saint Mary in Dhërmi.

Keywords: graphical documentation, photogrammetry, areal stereoscopic photogrammetry, metashape data, point clouds geo-referencing.

Topics: Artificial Intelligence & advanced technologies in Scientific Surveys/ Graphical-Oriented Developments: Architectural Objects and Historical Building

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Figure/Table: ArcGIS 3D Survey of The medieval bridge in Tirana's "Brar village"



VIRTUAL REALITIES: LEVERAGING AI FROM VIDEO GAME DESIGN FOR ARCHITECTURAL AND URBAN INNOVATION

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ABSTRACT

In the fields of video games and architecture, artificial intelligence has opened an entirely new world of possibilities for creativity and innovation. Design in video games, which heavily relies on AI to create complex environments, has become one of the biggest influences on the thought processes of architects and urban planners. Procedural generation, deep learning, and adaptive algorithms are some of the AI technologies that will shape architectural and urban design, enabling dynamic and responsive environments. These techniques facilitate the rapid generation of urban layouts and allow for the efficient exploration of design alternatives that would be time-consuming with traditional methods.

AI plays a vital role in simulating city growth, infrastructure, and environmental impacts. Such simulations assist architects and planners in

investigating design options, testing resilience, and predicting what a city might look like in the future. This research focuses on reviewing how AI used in video game design can influence architecture and urban planning. By gathering and synthesizing available insights, the research aims to highlight the potential of these technologies to solve complex design challenges and enhance efficiency in shaping the built environment.

Keywords: AI-driven Architecture, Video Games, Generative Design, Adaptive Environments

Topics: Generative Design: software, process, and design alternatives & Spatial Analytics: data, patterns, trends, and connections.

DESIGNING WITH HEART: INTEGRATING AI TO ELEVATE THE HUMAN SPIRIT IN URBAN EVOLUTION

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ABSTRACT

In an era where our cities are increasingly shaped by technology, we stand at a pivotal moment in history, one that challenges us to reconsider the essence of urban spaces. Integrating Artificial Intelligence (AI) into urban planning offers unparalleled opportunities, yet it raises a critical question: How can we ensure that our cities remain both technologically advanced and deeply human?

This research explores the transformative potential of AI in urban design, not merely for optimization but for creating spaces that resonate with the human experience. It advocates for an approach where AI is not just a tool but a partner in the creative process, helping to craft environments that nurture community, culture, and identity.

This paper emphasizes the need to blend AI's capabilities with empathy through case studies and

reflective analyses. By doing so, we can design efficient, intelligent, and emotionally enriching cities. The ultimate goal is to ensure that the cities of tomorrow are places where every individual feels valued and connected—a true testament to the power of design guided by both heart and innovation.

This is a compelling call to action for architects, urban planners, and technologists to embrace a holistic vision for the future—one where AI empowers us to build not just smart cities but meaningful ones. Through this integration of technology and empathy, we can truly fulfil the deeper purpose of our work: to craft spaces where the human spirit can flourish.

Keywords: Empathy in Urbanism, Human-Centered AI, Urban Evolution, Meaningful Architecture, Ethical Urban Planning

Topics: Spatial Analytics; AI and the Human

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THE IMPACT OF RING ROADS ON URBAN GROWTH PATTERNS: AN AGENT-BASED MODELING APPROACH

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ABSTRACT

Urban growth often gravitates toward existing road infrastructures, resulting in linear expansion that can undermine the efficiency of urban planning. This research explores the potential of ring roads to influence urban development patterns, encouraging a more compact and contained growth. An agent-based model was developed to simulate urban expansion in a hypothetical city. The model incorporates three primary rules: first, new development favours the city center; second, proximity to existing roads; and third, proximity to existing developments.

The simulation allows for user-defined directional roads and ring roads with adjustable radii. By comparing scenarios with and without ring roads, the

model evaluates their effectiveness in mitigating linear development and promoting a compact urban form. The objective is to assess whether ring roads can effectively contain urban sprawl and encourage a more compact urban form, providing valuable insights for sustainable urban planning and sprawl mitigation.

Keywords: Urban Growth, Agent-Based Modelling, Compact, Ring Roads

Topics: Spatial Analytics

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AI APPLICATIONS IN BIOTECHNOLOGY IN HAZARDOUS WASTE MANAGEMENT: A CASE STUDY OF INDUSTRIAL PLANTS LOCATED IN MITROVICA

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ABSTRACT

Environmental pollution caused by industrial waste is a global issue, and Kosovo is no exception, grappling with extensive active tailings from mining activities, which have been the main economic activity in Kosovo for years. This research aims to assess the application of biotechnology, as concerns around green infrastructure have grown significantly in recent years.

The city of Mitrovica is home to 220 hectares of industrial landfills, which pose serious threats to the environment and human health. Urban remediation and rehabilitation of waste and industrial waters, which have degraded the environment and caused fatalities for years, remains an ongoing and unfulfilled task. In countries where industrial complexes, especially mining operations, lead to air and water pollution, various measures are being implemented to clean up industrial sites. One of the most commonly applied interventions is biotechnology—the use of biological processes, including microbial reactions, to degrade and detoxify hazardous waste.

As in other fields, AI algorithms are playing a significant role in transforming biotechnology by

enabling human researchers to process datasets in a short time.

Given the impact of biotechnology on our world and the role of AI in the biotech field, there is no denying the need for advanced technology to improve environmental quality on multiple fronts. From data processing and task automation to accelerating the discovery phase, AI can be used in various ways in biotechnology to advance green infrastructure by enhancing its design, operation, and effectiveness.

This paper aims to examine the impact and potential of AI in biotechnology for improving industrial waste classification, predicting heavy metal levels in tailings, and modelling waste incineration processes, all contributing to a more sustainable environment with efficient, economical, ecological, and intelligent waste management systems.

Keywords: artificial intelligence, urban pollution, ecological urban rehabilitation, waste management, cost efficiency

Topics: Biotechnology: living facades and green infrastructure

GAUDI UNMASKED: AI AND THE PARANOIAC-CRITICAL METHOD TO GO BEYOND HIDDEN DEPTHS

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ABSTRACT

Antoni Gaudí's architectural masterpieces, celebrated for their organic design that appears self-created by nature, have long been a focal point of intrigue and discussion in architectural discourse. Gaudí's influence extends beyond architecture, as evidenced by Salvador Dalí, who found inspiration in Gaudí's work while developing his own language of surrealism. This paper aims to explore Gaudí's work through Salvador Dalí's Paranoiac-Critical Method (PCM), a technique Dalí developed to systematize irrational thought. PCM is applied here to decode the multiple layers of meaning in Gaudí's work.

By integrating AI with PCM, this paper introduces a unique approach to understanding and interpreting the profound ambiguities in Gaudí's designs. This

method advances a new stage of interpretation, calling for fresh perspectives on architectural design and brilliance. AI's capabilities are leveraged to enhance PCM's power for interpreting architecture, deepening our understanding of Gaudí's genius. This AI-PCM approach enriches our perception of Gaudí's work and underscores AI's transformative potential in architectural analysis by offering dynamic and previously unexplored insights into architectural heritage.

Keywords: Antoni Gaudi; ambiguity; Salvador Dalí; paranoiac critical method; AI

Topics: AI and Cultural Heritage; Generative Design

ARTIFICIAL INTELLIGENCE AS A CATALYST FOR URBAN DEVELOPMENT: INSIGHTS FROM PRISHTINAI

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ABSTRACT

The use of Artificial Intelligence (AI) in urban planning and architectural design has been a topic of discussion since its inception. Despite the controversy, the undeniable presence of AI in the future of both urban development and architectural design must be recognized as a powerful tool and treated accordingly. Numerous studies have argued that AI is already a more efficient planner than human professionals. For instance, a study conducted at Tsinghua University in China demonstrated that their AI-based urban planning system successfully created several innovative projects adhering to Carlos Moreno's "15-minute city" concept.

To further advance these systems, it is essential to gather more data from both professionals and the public, enabling better predictions of urban trends and patterns and incorporating a strong user-based perspective in design. This fundamental principle positions AI as a creative tool rather than a creator itself. By maintaining this distinction, the potential for optimizing the planning process becomes seemingly limitless.

This study examines the outcomes of the urban planning workshop "PrishtinAI," held during the

Kosovo Architecture Festival in 2023 by Damiano Cerrone, founder of UrbanistAI+SPIN UNIT. The workshop included participants from diverse backgrounds who had no prior experience with AI-based urban planning programs. Their task was to redesign several problematic urban spaces in Prishtina, Kosovo, using the AI tool to quickly visualize their ideas based on their descriptions. While the outcomes varied significantly—some more realistic than others—participants identified key priorities for the local community. However, the workshop's process proved more valuable than the results themselves. By discussing ideas and methods for implementing the AI-generated recommendations, participants uncovered issues that had previously been unnoticed. This highlights the benefits of AI-based analytic systems in the planning process without compromising the essential "human touch" in urban planning and architectural design.

Keywords: Artificial Intelligence, Urban Development, Participatory Design, Urban Trends and Patterns, Analytic Systems.

Topics: Spatial Analytics: data, patterns, trends, and connection

THE ROLE OF AI IN THE EVOLUTION OF DESIGNING

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ABSTRACT

With the rise of AI in various aspects of different professions, there is a growing need to establish where computer-generated assistance begins and human impact ends. In architecture, the human factor is the most critical aspect of the design and planning process. With this in mind, the question of how AI can aid rather than take over the process becomes essential to explore. As AI-generated assistance rapidly expands, the challenge of defining its role has become a significant issue. This paper aims to explore how AI can be beneficial in addressing major challenges that planners and designers face in their projects. While AI promises many positive outcomes on paper, its implementation could potentially separate originality from the humanistic side, leading

to a reliance on artificial inputs. This shift could result in the unification, simplification, and duplication of similar, if not identical, designs. Furthermore, would relying on AI make it easier for architects to overcome potential setbacks, or could it hinder the design process by limiting architects' imagination and thought processes with pre-made options and ideas?

The pros and cons of AI in architecture must be explored in greater depth to understand how the challenges can be mitigated and the benefits maximized.

Keywords: Utilization of AI, Architecture, Evolution of Design Process, Creative Enhancement.

Topics: Generative Design

ARTIFICIAL INTELLIGENCE (AI) TOWARDS THE SUSTAINABLE DEVELOPMENT OF INTELLIGENT BUILDINGS – PROJECT PROPOSAL FOR THE ADMINISTRATIVE BUILDING IN PRISHTINA

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ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative force in advancing sustainable development, particularly in the realm of smart buildings. This research paper explores the application of AI in the design and implementation of sustainable smart buildings, focusing on a proposed administrative building project in Prishtina.

The study examines how AI technologies can enhance the efficiency, environmental performance, and overall sustainability of building systems. It proposes a framework for integrating AI into the planning and construction processes of the new administrative building, aiming to optimize resource use, reduce energy consumption, and improve operational efficiency. By leveraging AI for predictive

maintenance, energy management, and intelligent automation, the project aspires to set a benchmark for sustainable architecture in Prishtina.

This paper provides a comprehensive analysis of AI-driven strategies and their potential impacts on the development of smart buildings, offering practical recommendations for stakeholders involved in the design and construction of sustainable infrastructure. The findings emphasize the role of AI in driving innovation and promoting sustainability in the built environment.

The study highlights the substantial impact of AI on enhancing sustainability in smart buildings. By integrating AI into the design, construction, and operational phases, the proposed administrative

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building in Prishtina is poised to become a model for future developments in sustainable architecture.

Keywords: Artificial Intelligence, Sustainable Development, Smart Buildings, Administrative Building, Prishtina, Energy Efficiency

Topics: Generative Design; Energy efficiency and sustainability: performance, integration, and optimization

AUTHOR INDEX

Alejna Gashi, 34
Amet Abdurahmani, 34
Ardita Byci Jakupi, 35
Ardita Shaqiri, 36
Arlinda Bresa, 37
Argeta Zekaj, 39
Arbëreshë Ibrahimimi, 56
Arta Basha Jakupi, 39
Aulona Sollova, 40
Bora Kelmendi Beqiraj, 40
Blerta Breznica, 54
Clément Blanchet, 41
Damir Rahmani, 56
Dasara Pula Hamza, 42
Dukagjin Hasimja, 42
Edmond Manahasa, 43
Flaka Xërxa Beqiri, 57
Florian Shala, 39
Florian Popaj, 39
Florina Jerliu, 46
Fjolla Citaku, 40
Jon Krasniqi, 40
Kaltrina Spahiu, 45
Leart Damoni, 40
Leodina Spahiu, 40
Leon Saraçini, 56
Leunita Syla, 46
Lisjan Tushaj, 48
Manjola Logli, 43
Marigona Rexha, 54
Marija Miloshevaska Janakieska, 56
Odeta Manahasa, 43
Public Space Equity – PSE, 46
Rina Brovina, 50
Rinë Krasniqi, 57
Rinë Zogiani, 51, 54
Rron Beqiri, 52
Rrona Berisha, 39, 40
Safete Dauti, 53
Tea Zakula, 37
Teuta Jashari Kajtazi, 51, 54
Tringa Hasbahta, 55
Verone Kadriu, 53
Violeta Nushi, 57
Vjosa Saraçini, 56
Vlora Navakazi, 57

