Artificial Intelligence and the future of Construction*

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Abstract

The Third International Workshop on Artificial Intelligence for the Future of Construction (AI4Construction-2026) was organized within the framework of the SMARTINDUSTRY-2026 conference in Lviv, Ukraine, as part of the activities of the international Horizon Europe project ZEBAI. The workshop brought together researchers, industry experts, engineers, policymakers, and young scientists to discuss recent advances in artificial intelligence for sustainable, intelligent, and zero-emission construction. The workshop focused on modern AI-driven approaches for the digital transformation of the construction sector, including intelligent decision-support systems, predictive analytics, digital twins, data-driven optimization, smart monitoring technologies, and AI-assisted management of energy-efficient buildings and infrastructure. Considerable attention was devoted to the challenges of integrating trustworthy and explainable artificial intelligence into real construction processes, as well as to the development of resilient and environmentally sustainable urban ecosystems. Within the workshop, the participants discussed current scientific problems and practical tasks related to the implementation of AI technologies in architecture, civil engineering, urban infrastructure, and building lifecycle management. Special emphasis was placed on interdisciplinary collaboration between academia, industry, and international partners, which is essential for accelerating innovation and transferring research results into practice. The workshop was conducted in close connection with the objectives of the ZEBAI project, which aims to develop innovative AI-enhanced methodologies and digital solutions for sustainable and zero-emission buildings. The presented research results demonstrated the practical potential of artificial intelligence for improving energy efficiency, optimizing construction and maintenance processes, supporting informed decision-making, and advancing the digitalization of the built environment. The discussions and scientific presentations confirmed the growing importance of artificial intelligence as a key enabling technology for the future modernization, sustainability, and resilience of the construction industry. The workshop also contributed to strengthening international scientific cooperation and promoting the exchange of knowledge, experience, and innovative practices among researchers and stakeholders working in the field of smart and sustainable construction. AI4Construction 2026 supported by European Union's Horizon Europe research and innovation program under grant agreement No 101138678, project ZEBAI (Innovative methodologies for the design of Zero-Emission and cost-effective Buildings enhanced by Artificial Intelligence).

* *SmartIndustry 2026: 3rd International Conference on Smart Automation & Robotics for Future Industry, March 26-27, 2026, Lviv, Ukraine*

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