



Envisioning the futures

Designing and building for people and the environment

Trento, 11-14 June 2025

Book of abstracts

Editors

Rossano Albatici, Michela Dalprà, Maria Paola Gatti,
Gianluca Maracchini, Simone Torresin



UNIVERSITÀ
DI TRENTO



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Colloqui.AT.e 2025
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The 2025 edition of the conference Colloqui.AT.e is an opportunity for an open discussion and debate on the need to systemise the essential aspects of the construction sector, according to the three criteria of integration (of people, buildings, communities), circularity (economic and efficient use of resources) and simplicity (in planning, design, construction), in order to imagine not one but multiple possible 'futures' that intercept the horizons of the new generations and that are able to interpret them with principles, processes, solutions, technologies and products also linked to digital transformation (in new construction as for the existing heritage), addressed in a synergic and integrated manner to the renewed needs of people and the quality of the indoor and outdoor environment.

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Preliminary results of a methodological algorithm for the categorization of BIPV façades through the support of generative AI

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Abstract

In recent years, the photovoltaic sector has continued growing, and in 2023 power generation from solar PV represented nearly 60% of the worldwide renewable energy produced. BIPV growth has also confirmed even if the market segmentation still faces difficulties to classify products, due to the wide range of technologies, designs, and materials. This study shows the process defined to categorize the BIPV products and prototypes through the analysis of 4,692 scientific papers indexed in Scopus, focused on BIPV façades, with the support of AI. The categorization is based on the one proposed by the International Energy Agency-Photovoltaic Power Systems Programme (IEA-PVPS). At first, the papers have been selected based on a keyword search. Then, fine textual information from both the Abstract and those sections where Methods and Results are described, has been automatically extracted. All the texts were arranged in a JavaScript Object Notation (JSON) structure, and corresponding embeddings were calculated via a Large Language Model (LLM) to obtain a Vector Database. The LLM then queried to retrieve the relevant documents from the vector database, according to a given query that can be useful for paper categorization. All the retrieved documents for each tested query were manually validated based on the coherence of the provided query. However, the method needs to be more refined in order to eliminate ambiguity in the definitions that impact on obtaining high values of consistency of the retrieved text chunks.

Keywords

LLM, Information Retrieval, BIPV Façades, Categorization, AI.