Events

Symposium REAACH 2024

Roberta Spallone

REAACH 2024 is the fifth edition of the *REAACH Symposium* (fig. 1), an event that, over the two days of study on October 8 and 9, 2024, featured contributions from international scholars on the topic of the challenges of the discipline of Representation in light of the disruptive and interconnected phenomena of Artificial Intelligence (AI) and eXtended Reality (XR).

The symposium, first held in 2020, was born online because of the pandemic, after some postponements in the hope of keeping it in-person. The organizational simplicity, the possibility of reaching scholars in every part of the world, the modularity of the program, and the cost containment have, over the years, consolidated this mode of holding, coordinated by the three Chairs, Andrea Giordano, Michele Russo, and Roberta Spallone, at the DICEA (Civil, Environmental and Architectural Engineering) of the University of Padua. Following a call for extended abstracts, the proposals are selected for oral or video presentation at the symposium. The next phase involves the development of the research according to the directions of the Scientific Committee, up to the production of an extended contribution that, if accepted by the reviewers, is collected as a chapter in a collective volume, published in the 'Digital Innovations in Architecture, Engineering and Construction series' of Springer Nature.

While the annual holding of the symposium imposes a tight cyclicality in its organization and subsequent publication is the outcome of the discussion and directions of the Scientific Committee, it has the advantage of reading and interpreting the trends imposed by technologies and the ability of scholars to govern them, establishing a stringent link between the proposals of previous years and the new ones.

The survey of keywords – AI and/or XR are mandatory to target contributions appropriately; others should be drawn from a 'galaxy' of terms conceptually related and referring to the different declinations of the discipline of Representation – and the comparison between them in the successive editions of the symposium, allow for the identification of established and new trends in the studies presented.

In the inaugural presentation of the *REAACH Symposium 2024*, a brief *excursus* was made between themes and directions of the different editions in light of the previous considerations.

The first *REAACH-ID Symposium 2020* aimed to carry out a recognition, a fundamental one, of the research carried out by Representation scholars in Italy that explored new interests and intersections in the field of Artificial Intelligence and Augmented Reality (AR), outlining possible interdisciplinary collaborations and transdisciplinarity. The acronym *REAACH-ID*, conceived for the event, revealed the meaning of the initiative ('Representation for Enhancement and management through Augmented reality and Artificial intelligence: Cultural Heritage and Innovative Design').

The second step of the 2021 debate set the ambitious goal of exploring the new boundaries that, after just one year, AR and AI marked in Cultural Heritage and Innovative Design, opening up to international studies. That goal was achieved and surprisingly exceeded, thanks to the lymph provided by new proposals and scholars.

In the third *REAACH-ID Symposium* of 2022, it was observed that many of the topics addressed in the research corresponded to those listed in the Final Report 'Study on quality in 3D digitization of tangible cultural heritage: mapping parameters, formats, standards, benchmarks, methodologies, and guidelines', published in April 2022. In the last paragraph of the report devoted to 'Forecast Impact of Future Technological Advances', single points of attention in convergence
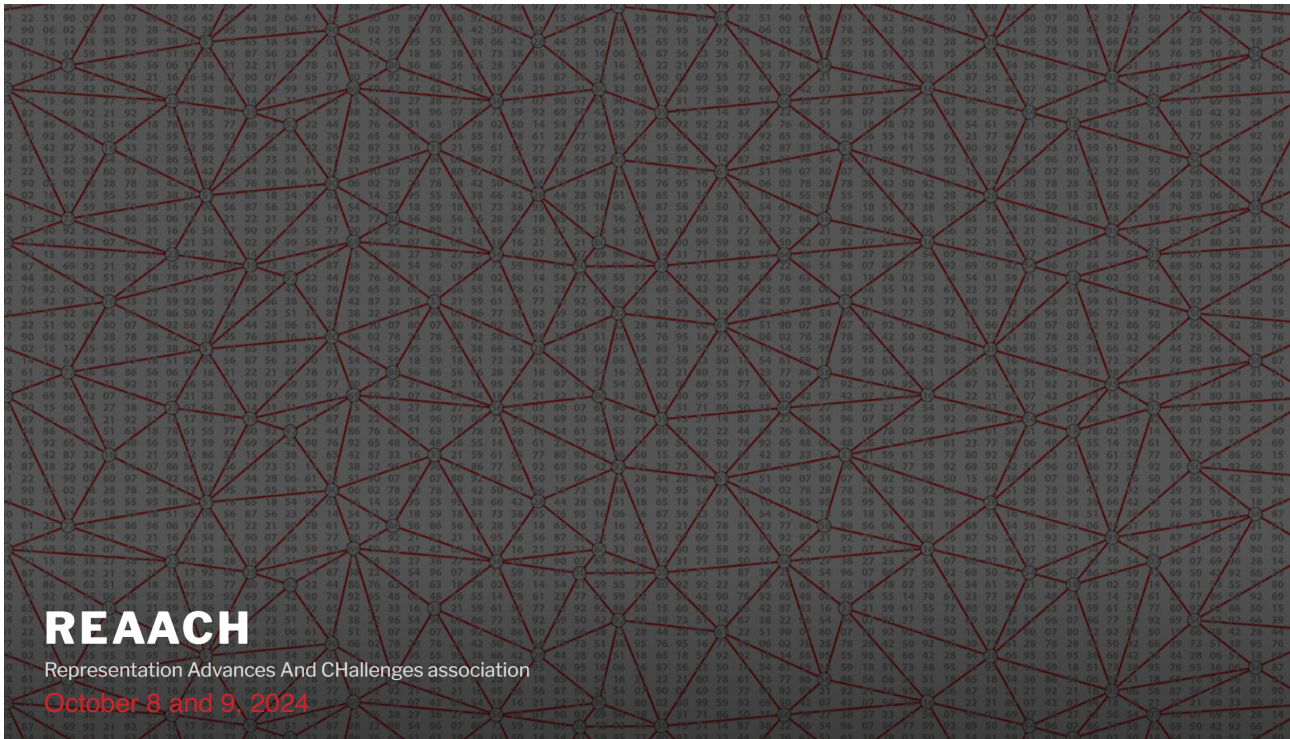
Fig. 1. Banner of the event.

with *REAACH-ID Symposium* topics were, among others, Extended Reality (AR, VR, MR), Metaverse, 5G, and the Continued Advancement of Mobile Technologies, BIM, HBIM, HHBIM, and the Digital Twin, Artificial Intelligence/ Machine Learning, Blockchain Technologies. In some studies, it also opened the big game of Generative Artificial Intelligence.
In 2023, the Symposium reconfigured its title to *REAACH* (REpresentation Advances And CHallenges), taking over the name of the REAACH Social Promotion Association (https:// www.reaach.eu/) which had just been

founded to direct its goals. The focus of the Symposium expanded to include the relationships of Representation with Artificial Intelligence and Extended Reality and a keywords scheme, the one discussed above, was structured to guide the construction of proposals. The rise of generative Artificial Intelligence was evident in both Cultural Heritage and Innovative Design.
The current *REAACH 2024* (https:// www.reaach.eu/symposium-2024/) featured 63 selected contributions: 42 in oral form and 19 in video. In total, the contributions involved 194 scholars from five continents.

Two keynote lectures characterized the study days, broadening the perspectives of AI and XR. The first, given by Francesco Carota and Gustavo Garcia do Amaral, both professors at the School of Architecture and Design at the University of Kansas, was titled 'Revealing and Interpreting Complex Urban Patterns from Location Based Social Network Data. An Investigation into Chinese Stadiums in the Global South' the second, by Lauren S. Ferro, from CSIRO's Data61 research institute in Melbourne, 'XR's challenges and solutions for cybersecurity'.

Fig. 2. Word cloud of the event.

Eight sessions punctuated the two days, organized according to the call's macro-themes: AI&XR and Historical Sources, AI&XR and Heritage Routes, AI&XR and Museum Heritage, AI&XR and Classification/3D Analysis, AI&XR and Building Information Modeling, AI&XR and Building Monitoring, AI&XR and Shape Representation, and AI&XR and Education. Thirty-one contributions identified the keyword AI as characterizing among the mandatory ones, twenty-eight the keyword XR, and three the pair AI&XR. Among the other keywords, as noted by the word cloud in the figure 2, terms related to the world of digital representation and the fields of its current application emerge.

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