

Events

REACH-ID 2022 Symposium

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The REACH-ID (*Representation for Enhancement and management through Augmented reality and Artificial intelligence: Cultural Heritage and Innovative Design*) symposium is now in its third edition, which was held, again this year, in webinar mode, on the days (October 11-12, 2022) organized by the promoting committee composed by Andrea Giordano of the University of Padua, Michele Russo of Sapienza University of Rome and Roberta Spallone of the Politecnico di Torino.

The symposium, which comes under the aegis of the Representation Challenges, re-proposes the combination of Augmented Reality (AR) and Artificial Intelligence (AI) by exploring its new frontiers, which are constantly being updated.

The purpose of the second Symposium (2021), triggered by the debate developed during REACH-ID 2020, was to go beyond the census of the research carried out by Representation scholars in Italy, exploring the new boundaries that, after just one year, AR and AI were marking in the fields of Cultural Heritage and Innovative Design on the scene of international studies. This goal was fully achieved, and we could say surpassed, thanks to the response and

participation of scholars in the 2022 edition of the symposium. They not only confirmed their interest and commitment in this area of research but also demonstrated, with a wide range of proposals and through the involvement of new scholars, the relevance of this event, which contributes to nurturing and stimulating research in this area of knowledge.

The relationship between Augmented Reality and Artificial Intelligence, strengthened by the increasing number of trans-disciplinary applications, solicits deep reflections in research fields related to the disciplines of Representation, a convergence place of theoretical and applied research traditionally related to architecture, the city, and the territory. In fact, the symposium proposed to the attention of scholars an exchange of ideas, experiences, and a discussion of research priorities and objectives, declined on the themes of Augmented Reality and Artificial Intelligence as tools for the analysis and knowledge of the environment around us, for architectural, environmental or infrastructural design and monitoring, and for the enhancement and communication of Cultural Heritage.

Based on these cultural directions, two different topics were identi-

fied, orienting contributions on: "AI/AR for space recognition and valorization", within Feature Recognition, Image Segmentation, Data Libraries, Marker/Markerless tracking, Interaction, and Immersive Experiences; "AI/AR for design, monitoring, and management" includes research and experiences on Point Clouds, Semantics and Ontologies, Element Classification, Hierarchical Structures, Sensors, and Archiving.

Following the institutional greetings of Francesca Fatta, president of UID, there was the opening address given by the members of the promoting committee, in which it was recalled how the research proposed for the two-day symposium would be, after the seminar, discussed by the members of the International Scientific Committee and the Reviewers Committee, who would provide guidelines, stimuli for ongoing research, as well as suggestions, requests for clarification and in-depth analysis concerning those already completed, a review process aimed at the production of the extended papers for publication in volume, expected in February 2023.

For this reason, and as the cutting-edge topics addressed require, the outcomes gathered in these two

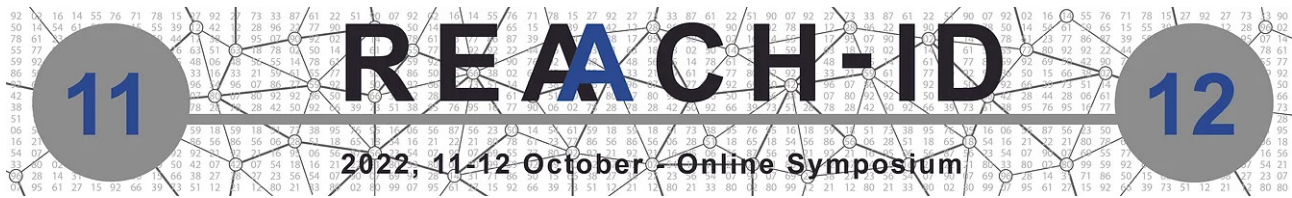


Fig. 1. Locandina dell'evento.

days of study turn out to be as up-to-date as possible, in complete adherence with the issues listed in the Final Report *Study on quality in 3D digitization of tangible cultural heritage: mapping parameters, formats, standards, benchmarks, methodologies, and guidelines* [1] funded by the European Community Commission Directorate-General of Communications Networks, Content & Technology. That report, published in April 2022, is the outcome of the research carried out by the consortium formed by the Cyprus University of Technology (CUT) and a group of experts, a 360-degree exploration of heritage digitization, including the concepts of complexity and quality, with a focus on standards and formats, but without neglecting to broaden the look at 3D digitization technologies and the world of Architecture, Engineering & Construction (AEC). In the last section of the report, devoted to the *Forecast Impact of Future Technological Advances*, individual points of attention in convergence with the REAACH-ID Symposium topics are, among others, Extended Reality (AR, VR, MR), Metaverse, 5G and the Continued Advancement of Mobile Technologies, BIM, HBIM, HHBIM, and Digital Twins, Artificial Intelligence/Machine Learning, Blockchain Technologies.

The analysis of the keywords chosen by the authors to represent the content of their research brings out the expected interest in digital technologies, primarily AR and AI, and their relations with Methodologies of Digital Acquisition (Photogrammetry and UAV Photogrammetry), Interpretive and Informational Visualization (BIM, H-BIM, 3D Modeling, VPL, Digital Fabrication, Mapping), Visual Communication (VR, Immersive Environment, Interactive Representation, and Hologram). In addition, several application areas emerge (Cultural Heritage, Museum, Education, Archaeology, Street Art, Urban, Built Heritage, Virtual Museum) and AI-related Practices (Machine Learning and Semantic Segmentation). Still, other terms seem likely to foreshadow new representation challenges, opening up new research and application fields. The two-day symposium consisted of seven sessions (a total of 29 papers and 109 authors) and three invited presentations by keynote speakers: Laura Vigo (Musée des Beaux-Arts de Montréal), with a presentation entitled *Subverting Museum's Untouchability through Digital?*, Arnadi Murtyoso (ETH Zürich), with the talk *Semantically enriched architectural photogrammetry using deep learning methods*, and Francesco Fassi (Department of Architecture, Construc-

tion Engineering and the Built Environment, Politecnico di Milano), who presented the speech *MR techniques for on-site fruition of 3D survey. The case of Milan Cathedral*. Twenty video presentations (40 authors) completed the scope of contributions. Lastly, it is important to mention how this edition of the conference also records a significant evolution of REAACH-ID Symposium which, during this year, promoted the founding, with some members of the Scientific Committee and emerging scholars in the different sessions of the Symposium, the REAACH Association (REpresentation Advances And Challenges APS, Social Promotion Association). The association aims to organize conferences and seminars, publications, as well as workshops and training activities devoted to fostering the exchange of knowledge and multidisciplinary research related to the advances and challenges on which the Disciplines of Representation are engaged in the present day [2]. We can say that also for this edition, we have witnessed a rich meeting, full of stimuli and challenges for the continuation of research in very rapid evolution, which will find new space for discussion in the next edition of the symposium, which will take place 10-11 October 2023.

Notes

- [1] EU Study VIGIE-2020/654. <<https://digital-strategy.ec.europa.eu/en/library/study-quality-3d-digitisation-tangible-cultural-heritage>> (accessed 9 December 2022).
- [2] <<https://www.reaach.eu/>> (accessed 9 December 2022).

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