

Events

Rip, Model & Learn: Interdisciplinary Dialogues on 3D Survey and Modelling for Architecture and Cultural Heritage

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The survey is knowledge and documentation; it is an instrument of historical, metric, material understanding and the state of conservation of the built heritage. The discussion on the survey of cultural heritage, in recent years, has been enriched with new reflections for technological and methodological advancement. In particular, the need for an interdisciplinary approach is increasingly being highlighted; a new vision that knows how to combine the interpretative needs of surveyors architects with the technical ability to acquire data from geomatics engineers. The last century saw the ideological contrast between the 'architects' survey and engineers' one'; a division that highlighted a different approach to the metric knowledge of buildings, justified by the different development of the degree courses. In fact, before the advent of digital, the photogrammetric treatment of images and topographical operations required a profound technical-applicative capacity based on a solid physical-mathematical basis; a path possible only at engineering schools where the study of history, representation and conservation of architecture was limited. On the other hand, training in architecture, while providing high skills for understanding the geometry and proportions

of buildings, as well as for reading the techniques and construction elements indispensable for the knowledge of the history of the monument, was sometimes incomplete on the technical-methodological aspects. The IT revolution, by simplifying the processes of construction and restitution of 3D models, brought the two worlds closer together, allowing for ease of interaction; today the teaching of disciplines related to the detection of cultural heritage in the new degree courses in Architecture and Building Engineering-Architecture (especially those in class L17, L23, LM24 and LM4) have a sufficient number of credits to sensitize students, both to read the architectural heritage and to provide it with the theoretical-practical bases necessary for the management of the data acquired with sensors.

Despite everything, some divisions remain, the result of an old cultural heritage that is slow to change; they contrast – instead of integrating – the different scientific fields. Contrasts that seem to be accepted and encouraged by a part of the academic world that considers the disciplines related to Cultural Heritage as sequential; consecutive stages of a process that starts from the capture of the data, to then continue with its processing and end with the rep-

resentation to document and enhance the monument.

The thematic subdivision is often the cause of seminars on topics of common interest which, however, are lacking in the involvement of the various actors of the knowledge process. Conferences built based on a 'scientific complementary' instead of an 'integration of study and research', without a general contextualization and a critical analysis free from ideological preconceptions; events that did not allow to start a constructive dialogue between the various disciplinary areas but, on the contrary, increased their distances.

A fragmented and segmented vision that requires Geomatics creators of information models designed for maximum accuracy and not optimized for understanding the monument; restorers who are simply users of a final result of which they are not the architects, therefore, without being aware of the phases of the survey; the draftsmen-surveyors useful complementary figures to the documentation and enhancement of the skills related to representation and graphic communication.

A point of view that fortunately is not shared by many scholars who seek, instead, a multidisciplinary and broad interdisciplinary dialogue, in a common sharing of intent.

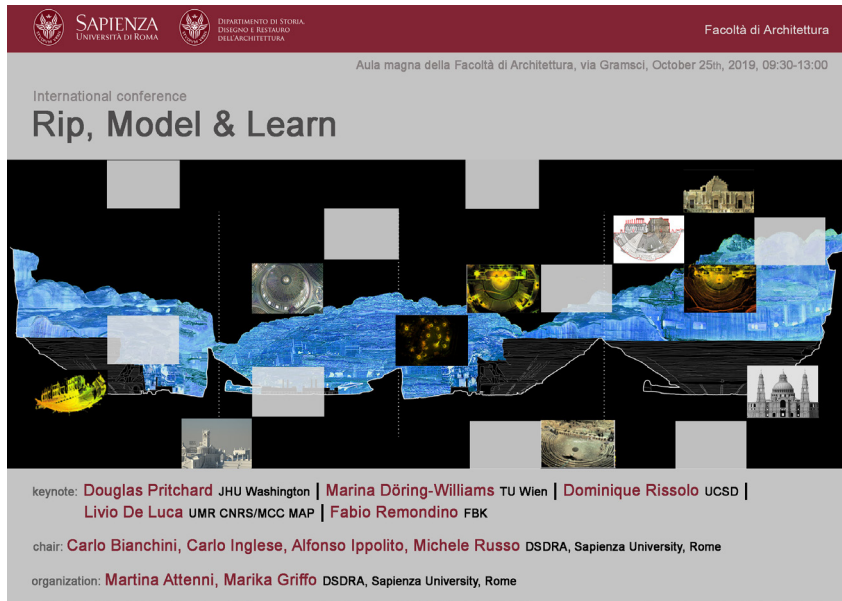


Fig. 1. The flyer of the "Rip, Model & Learn" symposium.

This is demonstrated by the success of numerous international initiatives which have attracted great interest and participants. Workshops and seminars, promoted and/or sponsored by the UID, which highlighted the importance of our field of study (SSD) in building a virtuous exchange, sharing and experimentation of new approaches in the detection of complex systems.

An important contribution to the creation of an interchange between doctrines to develop a unique language for sharing content. The year 2019 opened with the *3D-ARCH 2019* international conference which took place in February at the University of Bergamo, a first appointment organized by designers, geomatics and conservators aimed at launching

new reflections to which the *CIPA 2019* international seminar followed in September, promoted by the local Universidad de Salamanca in the city of Avila. Valid examples of this new understanding that have materialized through the formula of the traditional conference.

The *Rip, Model & Learn* symposium, in this context, was an opportunity to highlight the centrality of the Drawing on the knowledge project and to reiterate, with greater force, the importance of integration between the various skills. The meeting was on the morning of Friday 25 October 2019 in the hall of the *Aula Magna* of the Faculty of Architecture of Valle Giulia in Rome; promoted by the Department of History, Draw-

ing and Restoration of Architecture (DSDRA) of the Sapienza University of Rome, it has represented an important and valuable opportunity for international comparison on the topic of acquisition, management but, above all, the interpretation of electronic data for the documentation of cultural heritage. A communicative formula designed – under the scientific coordination of Carlo Bianchini, Carlo Inglese, Alfonso Ippolito and Michele Russo – on the use of Webinar Online Conferencing and Web-Streaming. The diffusion of the event was done both in leverage and the deferred way [1].

The reports, brief and entrusted to important researchers from different professional and cultural backgrounds (architects, engineers, historians and archaeologists), have allowed significant reflections related to the development of information acquisition and treatment technologies for the detection of historic buildings, and contemporary, with 3D range-based and 3D image-based technologies, terrestrial or with Remotely Piloted Aircraft Systems (RPAS).

The greetings to the speakers and participants were brought by Eugenio Gaudio, Magnificent Rector of the Sapienza University of Rome and by Anna Maria Giovenale, dean of the Faculty of Architecture. Carlo Bianchini, who then took the floor, started the work with a brief introduction, followed by the five *lectio magistralis* of the invited keynote speakers.

The first report *Documentation of the Built Environment* was by Douglas Pritchard of the Krieger School of Arts & Sciences of Johns Hopkins University in Washington. He illustrated his recent experiments on the new Zoller+Fröhlich instrumentation in

particular complex and multifaceted structures, such as the Cologne Cathedral, a site included in the UNESCO world list, and the CERN in Geneva, the famous European laboratory for nuclear research.

The second one was *Learn, Rip, Learn, Model and Learn* by Marina Döring-Williams of the Vienna University of Technology. A classical and expert scholar of the late ancient and medieval world, she highlighted the importance of an accurate survey – which she considers a consequent passage to direct observation – for stratigraphic reading and construction techniques, to understand the historical evolution of monuments.

The subsequent presentation was by Dominique Rissolo, of the Center of Interdisciplinary Science for Art, Architecture, and Archaeology of the University of California in San Diego, with the presentation *Beyond the Model*. An interesting examination of various case studies, including the baptistery of Florence, which have underlined how too frequently the creation of 'perfect' digital models makes one forget that 3D data is only one of the many essential characteristics of historical heritage. A particular observation point by an expert archaeologist who knows the detection systems, who has dedicated many of his years to the study of the Mayan coastal settlements on the Yucatan peninsula, evaluating the complexity of the architecture due to the cultural and social growth of its inhabitants.

Notes

[1] The conference is still available online at the link: <https://www.youtube.com/watch?v=dmi-PUv0cP3A> (accessed 2020, June 6).

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Fig. 2. The final moment of the round table.

So Livio De Luca, architect of the Centre National de la Recherche Scientifique (CNRS) in Marseille, with the report *Towards the massive reality-based 3D semantic annotation of heritage artefacts*, brought an interesting reflection on the possibility of digital technologies used for multidisciplinary crossings analysis, specific to the study of cultural heritage not only in the field of information technology and engineering, but also in the human and social sciences, as well as in architecture and conservation science. Finally the Fabio Remondino, engineer of the 3D Optical Metrology

(3DOM) of the Bruno Kessler Foundation (FBK) of Trento, with a speech entitled *Machine and Deep Learning strategies for the classification of heritage 3D data* have opened a discussion on the association of semantic information to spatial data with automated classification procedures based on learning approaches based on artificial intelligence (Machine and Deep learning). At the end of the presentations, an articulated and lively round table was held, in which there was a direct comparison between the speakers and the topics they addressed.