Applied Geomatics (2018) 10:277–278
https://doi.org/10.1007/s12518-018-0247-x

PREFACE

Special Issue GEORES2017. Geomatics and Restoration: Conservation of Cultural Heritage in the Digital Era. Preface

Grazia Tucci[1] · José Luis Lerma[2]

Published online: 10 November 2018

The very wide horizon of the geomatics methods developed in recent years —which are actively in progress— is successfully contributing to carry out innovation and applied research in the conservation and restoration sector, confirming a new field that might be called "geomatics for preservation" Geomatics for preservation is characterized by the successful grafting of multiple disciplines that can enrich, simplify, and assess better any intervention before, during, or after any activity takes place on cultural heritage. During the 20th CIPA International Congress in Torino (2005), Mr. Marco Dezzi Bardeschi, the President of the Italian International Council on Monuments and Sites (ICOMOS) National Committee at that time, already highlighted in his speech the increasingly demanding task of safeguarding the cultural heritage at risk which can only be sustained with a proper enlargement of the front of conservation operators. "A new computerized auxiliary science (Geomatics, in fact) is advancing to help the desired, virtuous new alliance between historians, topographers, surveyors and analysts of decays, diagnostics and designers of planned conservation and management plans of the building heritage" (Dezzi Bardeschi 2005).

Twelve years later, a new attempt to bridge the gap, still existent, between geomatics and restoration has been made thanks to a fruitful discussion on the impact that new digital technologies have had on the practice of recording cultural heritage in view of its preservation, dissemination, and valorisation. These two disciplines, geomatics and restoration or vice versa, have never really been completely independent because they are consecutive steps in the process of recording, enhancement, and safeguarding of cultural heritage.

Once, the main experts on historical buildings were also their surveyors, often equipped with a tape measure and plumb line to explore the space, noting down shapes and sizes, as their education, founded on the history of architecture, had taught them. Because of the revolution introduced by electronic and geoinformation technologies, increasingly specific technical skills have come to the forefront and high-performance tools are increasingly being spread: 3D digitisation (e.g., photogrammetry and scanning), rapid prototyping, high dynamic range spherical imagery, multispectral sensors, drone photography, virtual and augmented reality, and computer rendering in multiple dimensions. These tools are giving visions and data that are all at once enticing experts with new digital approaches. Their applications are used in conservation, education, research, risk assessment, planning, design, and 3D printing. Therefore, the concept and role of digital workflows for recording, processing, and disseminating information for the conservation of heritage places have substantially evolved (Santana Quintero 2017).

The gap between those who produce the data for heritage recording, documentation and preservation (namely geomatics experts) and those who manage heritage (restorers, art historians, heritage superintendents, and other scholars) has become more and more evident. The difficulties in the user-provider interaction, already highlighted during the RecorDIM (Heritage Recording, Documentation and Information Management) initiative supported by the Getty Conservation Institute, in collaboration with CIPA Heritage Documentation (one of the oldest International Scientific Committees of ICOMOS and the International Society of Photogrammetry and Remote Sensing, ISPRS), are to a large extent still open issues (Letellier et al. 2007). Geomatics experts and information users approach cultural heritage from different perspectives. For example, information providers

✉ Grazia Tucci
grazia.tucci@unifi.it

José Luis Lerma
jllerma@cgf.upv.es

[1] Department of Civil and Environmental Engineering – DICEA, University of Florence, Via di Santa Marta 3, 50139 Florence, Italy

[2] Department of Cartographic Engineering, Geodesy and Photogrammetry, Universitat Politècnica de València, Camino de Vera s/n. Edificio 7i, 46022 Valencia, Spain

often overestimate the importance of accuracy, while information users do not appreciate the importance of setting a correct methodology in order to create a reliable survey of an architectural complex or archaeological site.

While in the past it was difficult to distinguish between both the measurement and the interpretation of a building, object and monument, and even to identify a priority in the timing of the two operations, the technologies available today imply that on-site operations can be performed in reduced time spans. Hence, minimal hypotheses are required beforehand, and the interpretative phase can systematically be placed after the measurement stage. The risk is that the consequent inevitable succession of the measurement–analysis phases and the compression of the time required for the first may result in passing over the different multifaceted dimensions of the perceptive experience, which are nevertheless still indispensable in the subsequent modelling hypotheses. Nowadays, geomatics bring the recording of heritage sites into the lab, allowing geomatics experts and heritage curators to sit down together, sharing information and analyse data, in a way that heritage curators can work on heritage from the lab, enabling new possibilities of interpretation and analysis that are not possible in the field (Tucci and Bonora 2015). Besides, CIPA Heritage documentation facilitates the transfer of technology from the measurement sciences to the disciplines of cultural heritage recording, conservation and documentation, and contributes with guidelines for best practices, scientific activities (meetings, workshops and summer schools…) and publications since 1968 (Santana Quintero et al. 2017).

Starting from the main output coming from all technologies —3D point clouds— a myriad of new representations is offered for visualisation, planning, research and analysis of conservation and restoration projects, and for disseminating information about heritage sites. Sharing, exchanging, and exploring new approaches, good practices, and research results in this cross-disciplinary area bridging these two worlds should be helpful to develop a common language and to share common goals.

GEORES2017, the first International Conference on "Geomatics and Restoration: Conservation of Cultural Heritage in the Digital Era" took place in Florence on 22–24 May 2017. GEORES2017 was initiated to bring together a broad community of experts, the Italian Academic Association of Topography and Cartography (AUTEC), the Italian Academic Association of Architectural Restoration (SIRA), and the Italian Geographic Military Institute (IGMI), which work in different realms of the cultural heritage sector, to facilitate interdisciplinary exchange beyond these communities. The conference was supported by CIPA Heritage Documentation and ISPRS (WG V/1, WG V/2 WG II/8, WG VI/2). It was also under the patronage of the UNESCO Italian Committee, the Italian Ministry of Cultural Heritage and Activities and Tourism, ICOMOS–Italy, and the Italian Society of Photogrammetry and Topography (SIFET).

The programme included more than 90 presentations which covered methodological advances in recording, documentation and analysis of heritage sites as well as advances in technologies, instruments and data management, without forgetting education and dissemination. Most of the presentations were made by co-authors from the two different worlds; in this way, it was possible to present case studies where, truly, joint reflections allowed an enhancement in knowledge related to the preservation of our fragile heritage.

The contributing authors were invited to submit revised versions of their papers to Applied Geomatics for publication in this Special Issue: more than 25 papers were submitted, and 22 papers were finally accepted based on the peer-reviewing process. The whole papers compiled herein are related to the topics of the GeoRes2017 conference according to the following sub-sections: risk and resilience; the use of digital images in visible and non-visible ranges; thematic data documenting materials, alterations and decays; HBIM for management and maintenance; documentation of monumental complexes; digital and physical replicas; augmented reality and virtual restoration; education and dissemination. We hope that these papers will not only highlight the broadness of "geomatics for preservation" but will also spark further ideas from which academics, architects, archaeologists, engineers, surveyors, restorers, decision makers, and students interested in cultural heritage will greatly benefit.

Finally, we would like to thank all the authors who have contributed to this Special Issue, including those whose papers were unfortunately rejected for publication, the anonymous reviewers, and Dr. Erica I. Parisi who played an important role as assistant editor during all the peer review process. Last but not least, we would like to extend our gratitude to Prof. Alessandro Capra, the Editor of Applied Geomatics, for his support and guidance.

References

Dezzi Bardeschi M (2005) Geomatica per la conservazione, ovvero: l'ombra e la cosa "ΑΝΑΓΚΗ", 48/2005, pp 126–133

Letellier R, Schmid W, Leblanc F (2007) Recording, documentation, and information management for the conservation of heritage places: guiding principles. Getty Conservation Institute, Los Angeles

Santana Quintero M (2017) Harnessing digital workflows for conserving historic places. Int Arch Photogramm Remote Sens Spat Inf Sci XLII-5/W1:9–14

Santana Quintero M, Georgopoulos A, Stylianidis E, Lerma JL, Remondino F (2017) CIPA's mission: digitally documenting cultural heritage. APT bulletin: the journal of preservation. Technology 48(4):51–54

Tucci G, Bonora V (2015) Geomatics and management of at-risk cultural heritage. Rendiconti Lincei 26:105–114