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The "O. Wagner Pavillon Test" and the "RecorDIM Initiative": Two actions to fit CIPA-HD's goals / Rinaudo, F.. - In: INTERNATIONAL ARCHIVES OF THE PHOTOGRAMMETRY, REMOTE SENSING AND SPATIAL INFORMATION SCIENCES. - ISSN 2194-9034. - ELETTRONICO. - XLII-2/W14:(2019), pp. 107-115. [10.5194/isprs-archives-XLII-2-W14-1-2019]

Availability:

This version is available at: 11583/2752192 since: 2019-09-17T12:24:45Z

Publisher:

Copernicus Publ.

Published

DOI:10.5194/isprs-archives-XLII-2-W14-1-2019

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The "O. Wagner Pavillon Test" and the "RecordDIM Initiative": Two actions to fit CIPA-HD's goals

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1. Introduction

One of CIPA-HD's main goal is encouraging and promoting the development of principles and good practices for recording, documentation, and information management of cultural heritage. During the first years, CIPA-HD's efforts were more devoted to the diffusion of photogrammetry as the best way to provide metric information about cultural heritage assets. The biannual Symposia and the promotion of books and other material were the ways that CIPA promoted knowledge to ease the use of photogrammetry for architectural objects.

The analytical development of photogrammetry, which started after the replication of the analogical approaches and the automatization of the photogrammetric triangulation – opened the possibility to use semi-metric and non-metric mages after a calibration process. By considering the real accuracies required in many cases for architectural surveys, the scientific community proposed many simplified plotting solutions, and CIPA made significant efforts to diffuse those methods inside the International Council on Monuments and Sites (ICOMOS) community. In the framework of these efforts, CIPA proposed an initiative to state the level of reachable accuracies by using non-photogrammetric cameras (see par. 2).

The introduction of the digital images as primary data in 1984, allowed, in the following years, the simplification of the plotting instruments and a significant reduction of the costs and of the manual skills required to manage a photogrammetric survey. This "digital revolution" gave an indisputable contribution to the diffusion of photogrammetry among the cultural heritage community.

This large diffusion of the digital photogrammetric techniques and the rapid growth of terrestrial LiDAR and aerial systems drove the CIPA community towards a new perspective, which suggested the integration of the CIPA's goals with a more extensive subject: the documentation of cultural heritage assets. Inside this new topic, the metric survey plays a fundamental role but it must be adapted (both in

terms of accuracy and deliverables) to integrate other kinds of data that are useful to define the real conditions of a cultural heritage asset at specific time (building, urban centre, garden, natural landscape, etc.). The idea of the “documentation” can already be seen from the first statements contained in the various International Charters, but CIPA felt the need to better define the concept of the documentation by supporting a special project funded by Getty Conservation Institute (GCI) (see par. 3).

In the following paragraphs, the main results of the two cited initiatives managed by CIPA are briefly described as a testimony of the work done so far by the CIPA (now CIPA-HD) community.

2. The "O. Wagner Pavillon" test

During the XIV International Symposium of CIPA, held in Delphi (Greece), CIPA launched an international test on the new potentialities offered by non-photogrammetric cameras (e.g. semi-metric and non-metric cameras of different formats) (Waldhäusl, 1991). The Technical University of Vienna, under the coordination of Peter Waldhäusl, built up the benchmark (Figures 1 and 2).



Figure 1. Semi-metric and amateur images: amateur Hasselblad camera (up), semi-metric LEICA Elcovision camera (down).

The benchmark produced a set of images taken by using two different calibrated semi-metric cameras (medium and small format) and two non-metric cameras (one of medium format equipped with a calibration certificate and one of small format without any calibration), as well as a network of control points to allow for autonomous calibration, orientation, and check of reachable precision and accuracy (Figure 2).

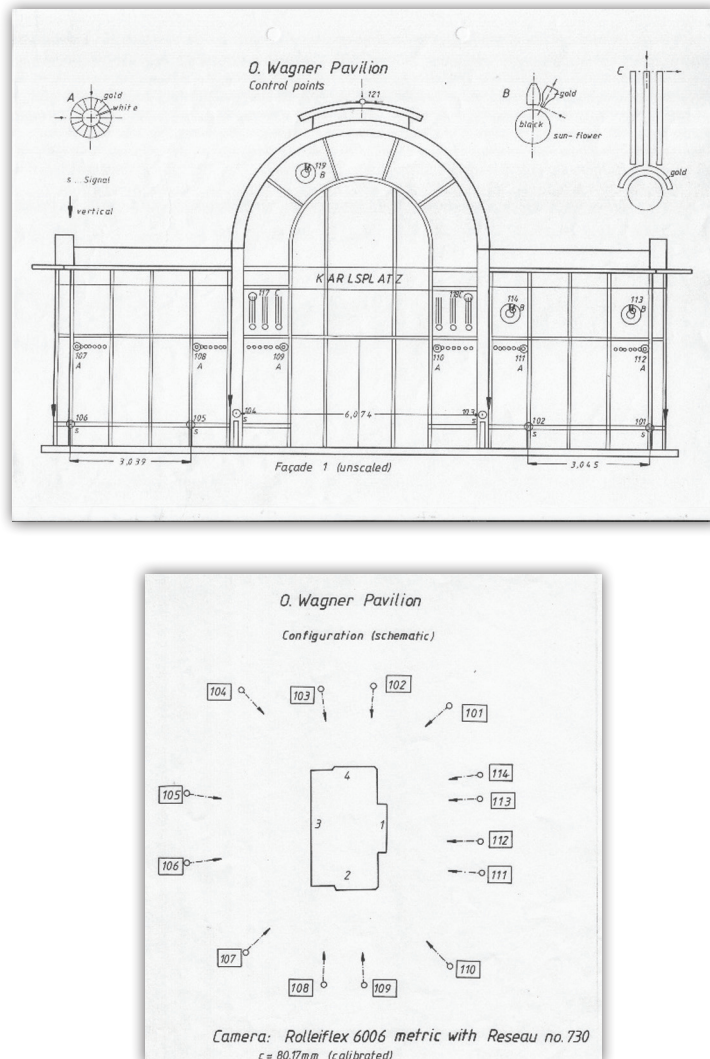


Figure 2. Provided metric information by 3D point's sketches and distances (up). Image acquisition scheme (down).

Twelve different research centers, from six different countries, provided the results of their elaborations and the Aristotle University of Thessaloniki, under the responsibility of Petros Patias, took care about the analysis of the results. Petros Patias and his collaborators analyzed the results from the participants and inferred that by assuming enough control, proper pre-calibration or careful self-calibration and proper photogrammetric procedure, adequate results for architectural use could be obtained (0.5 cm) even with small-format non-metric cameras. It must be noticed that all the images were taken by considering the traditional scheme of the photogrammetry (e.g. normal case) and by respecting the base/distance ratios recommended for correct photogrammetric applications. Finally, an experimental formula was proposed to predict the achievable precision by taking into consideration the basic properties of the used equipment.

By considering state of the art at those times, the test and the achieved results opened a rapid diffusion of the photogrammetric metric surveys to the ICOMOS community by reducing the use of metric cameras and by assuming, as a practical tool for image acquisition and control information, the proposed "CIPA 3x3 rules".

Some of the participants also used the achieved results to start testing digital photogrammetry and Terrestrial Laser Scanner (TLS) technologies (Figure 3). In the following years, those techniques pushed a different approach of the metric survey: from the manual selection of the needed points to build up a 3D model



Figure 3. The first architectural true-orthophoto generated by using the "Otto Wagner Pavillon" test material integrated with first point-clouds surveyed by Terrestrial Laser Scanning systems (Boccardo et al, 2001).

toward the automatic acquisition of irregular point clouds and the consequent segmentation and modelling phases that today represent the standard approach in a 3D architectural metric survey.

3. The RecorDIM initiative

During the XVIII CIPA Symposium (Postdam – Germany, 2001) Robin Letellier reported about an initiative developed in the previous five years: the CIPA “5-Year outreach Workshops” Program (Letellier, 2001). Three outreach workshops took place (Austria 1996, Sweden 1997, and Brazil 1999): those meetings brought CIPA to reflect on its activities, to question its operations, and to work towards restructuring itself with a new framework of activities. This activity represented a forum for metric surveyors (the information providers) and conservation specialists (the information users) to discuss and integrate recording, documentation, and information management principles and practices to cultural heritage conservation activities. In other words, CIPA wanted to push the research of metric survey techniques towards a real satisfaction of users’ needs. In this framework, the concept “Bridging the Gap” was developed in concert with the GCI during the year 2000, to assist CIPA with increasing “information users” participation to CIPA’s activities.

During the same CIPA Symposium, François Le Blanc and Christopher Gray (GCI) expressed the interest of their organization to work – in partnership with ICOMOS and CIPA – on a five-year initiative to identify and define the gaps between the information users and providers, and to support CIPA in its efforts to find partners that will take on the task (Le Blanc, 2001). The initiative was entitled “Recording Documentation and Information Management (RecorDIM).” Robin Letellier and Bill Blake were appointed as International Coordinators of the initiative, and the partners were represented by François Le Blanc and Rand Eppich (GCI), Peter Waldhäusl (CIPA-HD), and Giora Solar (ICOMOS). Round-table discussions and partner meetings were organized to define the gaps between information users and providers, and guidelines were published for heritage recording, documentation and information management.

Those meetings took place in Los Angeles, Wien, Leuven, Paris, Istanbul, and Turin jointly to CIPA Symposia, ICOMOS General Assemblies, and other meetings to ease the participation of different stakeholders. Sixteen Task Groups worked actively to discuss the problems, to underline possible solutions, and to produce final reports. Beside internal reports of the activities (e.g. partners meetings, round-tables, etc.) some major products were realized and published.

The two-volume *Recording, Documentation, and Information Management for the Conservation of Heritage Places*, with an international focus, was published by the GCI in 2007. *Guiding Principles (vol. 1)*, is directed toward heritage managers and stresses the importance of documentation. It discusses the basic documentation

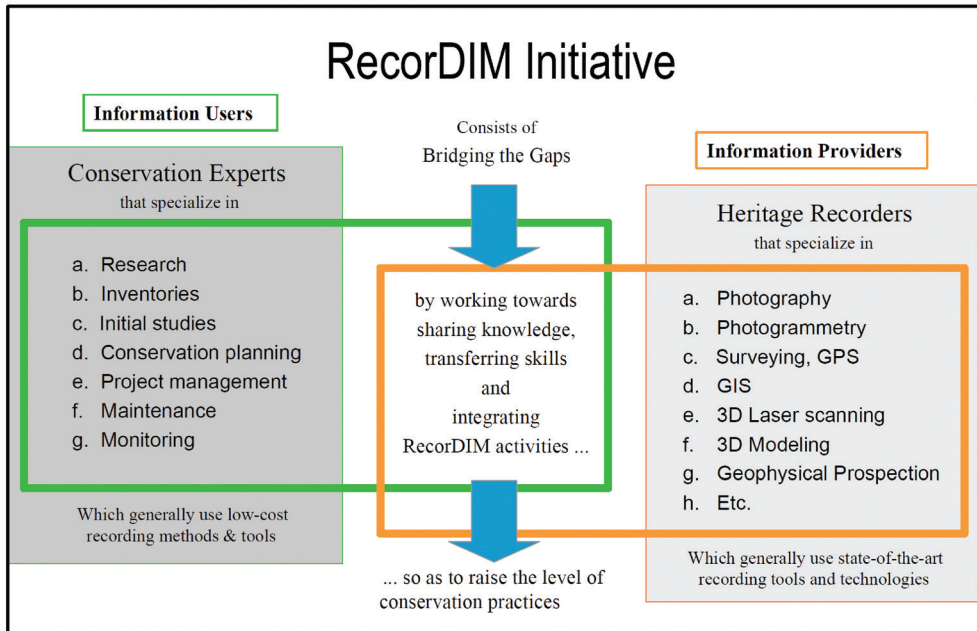


Figure 4. Long-term purpose and objectives of the RecorDIM Initiative.

principles and approaches. *Illustrated Examples (vol. 2)*, is a series of eighteen short case studies on successful projects around the world where documentation was crucial to the conservation.

The third volume, *Metric Survey for Heritage Documentation*, presents a practical guide that teaches basic metric survey skills for conservation activities. English Heritage continued to upgrade and publish this last outcome, eventually expanding the experience by publishing handbooks on most of the techniques. Those publications are now accessible through Historic England website and are periodically updated as technology develops. The fourth publication, *A Guide to the Use of Geographic Information Systems (GIS) at Cultural Heritage Sites*, is directed toward expert users of GIS software. A fifth report, *Guide to Creating Inventories of Cultural Heritage Places for India*, was printed on a limited basis and made available in India.

Conservation education concerning documentation was accomplished with a series of four courses in partnership with the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), which were held between 2003 and 2009. These courses, named “ARIS: Architectural Records, Inventories and Information Systems for Conservation”, trained 59 mid-career



Figure 5. Participants to the RecordIM partners meeting in Leuven (2004).

professionals from over 46 countries and involved over 29 instructors from over 18 countries. Support in the form of staff time was also given to existing educational institutions under this project from 2004 to 2010: Raymond Lemaire International Center for Conservation at the Katholieke Universiteit Leuven, University of Pennsylvania School of Design, Politecnico di Torino, the UCLA/Getty Master's Program on the Conservation of Ethnographic and Archaeological Materials, and the UNESCO World Heritage Center.

4. Final remarks

The described activities show the efforts made during the years by the CIPA-HD members to update structures and goals by considering technological advances in the evolution of conservation strategies. Cultural heritage documentation is not a self-defined discipline but a common effort of different skilled experts who are pushed to work together at an interdisciplinary level. To obtain the maximum possible results in this effort requires that the main experts in all the disciplines involved in the documentation can share their ideas and perspectives.

CIPA has shown in the past that it can promote and support interesting initiatives that enable significant progress to be made in the development of documentation for the World's cultural heritage.

All this was possible thanks to the competence and generosity always demonstrated by those who actively worked to achieve this aim.

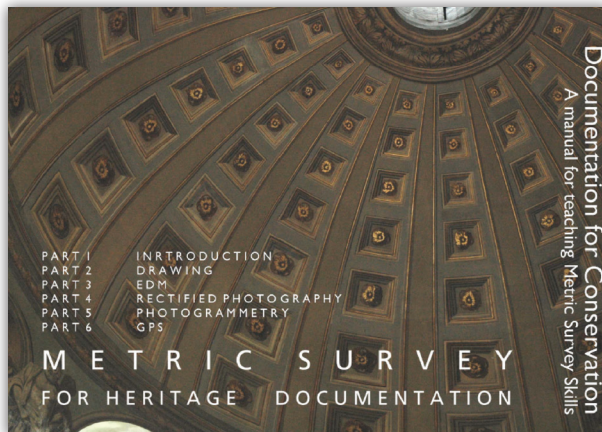
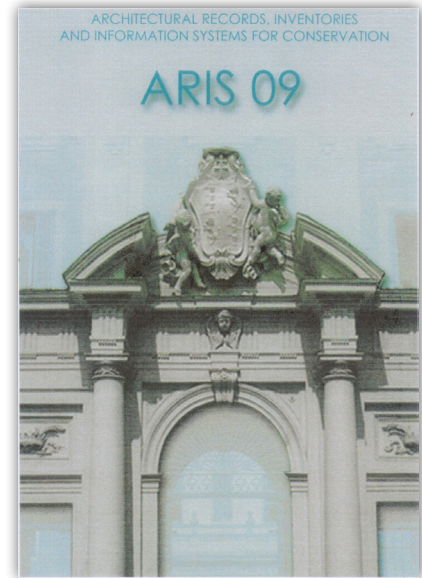
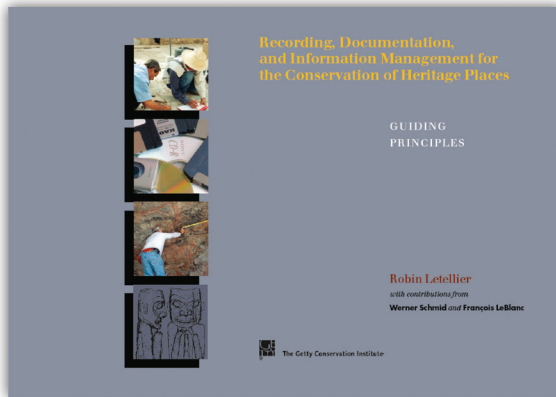


Figure 6. RecordDIM deliverables: the three handbooks and the leaflet of the ARIS Course in 2009.

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WEB-SITES

RecorDIM Initiative: <http://extranet.getty.edu/gci/recordim/>

Historic England:

<https://historicengland.org.uk/advice/technical-advice/recording-heritage/>

