

## Towards an optimal spectral and spatial documentation of our cultural heritage - COSCH, an action in the frame of COST

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### ABSTRACT:

True, precise and complete documentation of artefacts is essential for conservation and preservation of our cultural heritage (CH). By ensuring access to the best possible documentation of artefacts COSCH (Colour and Space in Cultural Heritage) wants to contribute to the enhanced understanding of material CH and help its long-term preservation. Documentation of CH involves researchers, scientists and professionals from multiple disciplines and industries. There is a need to promote research, development and application of non-contact optical measurement techniques (spectral and spatial) – adapted to the needs of heritage documentation – on a concerted European level, in order to protect, preserve, analyse understand, model, virtually reproduce, document and publish important CH in Europe and beyond.

Research in this field typically relies on nationally-funded projects with little interaction between stakeholders. COSCH will provide a stimulating framework for articulating and clarifying problems, sharing solutions and skills, standardising methodologies and protocols, encouraging a common understanding, widening applications and dissemination on an European level. The Action will foster open standards for state-of-the-art documentation of CH. It will simplify the usage of high-resolution optical techniques in CH and define good practice and stimulate research.

In this context a close collaboration between the cultural sector and scientists is paramount to ensure mutual understanding of the requirements of CH documentation and how technology should develop to meet these requirements. Humanities specialists will learn about the state-of-the-art techniques for precision spectral and spatial documentation in order to explore the huge potential of non-contact methods in their fields. Scientists knowing optical technologies need to learn about the requirements for documentation and analysis of valuable heritage objects, such as paintings, sculptures, buildings, etc. in order to optimize current methods and ensure that future developments go in the right direction. Material scientists, physicists and chemists may provide the theoretical, scientific background in order to link optical data with material properties.

This interdisciplinary COST Action will bridge the humanities with the optical and information sciences. Material sciences are also involved owing to a strong connection between the surface material of heritage objects, their visual appearance and techniques suitable for optical documentation. Also the involvement of chemists will be helpful owing to the dependence of spectral reflectance on the chemical composition of an object; this will be of great interest when investigating ageing processes.

Through this coordinated Action scientific progress can be expected, in particular concerning spatio-spectral acquisition, processing, rendering and quality evaluation for heritage documentation. Arts and Humanities researchers, museum professionals and educators will benefit from accurate records of artefacts, once access to these is made available to them, while scientists developing optical recording techniques will benefit from the guidance of standards and principles widely applied in the cultural sector, such as the UNESCO and ICOMOS charters on documentation and preservation of heritage and digital heritage, and the London Charter for 3D Visualisation of Cultural Heritage.

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All this requires effective exchange of information and the development of mutual understanding, which preferably can be achieved through exposure to and discussion of interdisciplinary research integrating all scientific disciplines involved. Particularly progress can be expected, when this interdisciplinary research is conducted on a European level in order to maximally integrate the variety of available knowledge inside Europe.

The recently started activities are organised in 5 working groups covering their own objectives addressing scientists with respective knowledge and experience and inviting to contribute to the scientific dialogue and to enter into cooperative research activities. The working groups are

WG 1: Spectral object documentation

WG 2: Spatial object documentation

WG 3: Algorithms and procedures

WG 4: Analysis and restoration of CH surfaces and objects

WG 5: Visualisation of CH objects and its dissemination

Main objectives of the work organized by this Action are:

1. Theoretical identification and practical exploration of important characteristics of instruments and their potential impact on data quality, usability and information content with respect to typical surfaces
2. Identification and definition of typical application/object requirements and their impact on the characteristics of data to be able to support these applications
3. Theoretical analysis and practical investigation of typical and necessary processing tasks and their potential or real impact on quality and information content of results
4. Selection of typical applications and/or objects to be subject of implementation of optimal processing chains, from data capture up to the final results, guided by all the interdisciplinary expertise available to COSCH
5. Establishment of the conceptual and practical frameworks for multisensory data acquisition, its implementation and evaluation
6. Development of recommendations for solution providers as well as end users. These recommendations would facilitate a deeper integration of optical technology into CH applications through an improved correlation between optical means and requirements

Due to the nature as COST Action COSCH provides a framework open to organisations, institutions and enterprises interested in collaboration within the emerging field of precise spectral and spatial imaging techniques, in physical and chemical sciences applied to CH objects, as well as in research and application of conservation and art-historical analysis of CH objects.

The networking, information exchange and capacity building measures among researchers in this Action will be coordinated through COST and will be implemented by Training Schools (TS), short term scientific missions (STSM) and plenary workshops, a dedicated website, conferences, publications and new project proposals.

This Action is continuously open to interested people and organisations being willing to collaborate in this interesting and important field of work. They just have to address their interest to the Management Committee organising and coordinating this Action or may have a look on the Action Web site (<http://www.cosch.info>). As financial contribution COST will provide the budget to perform all networking activities listed above (TS, STSM, workshops etc.).