SYDDARTA

CULTURAL HERITAGE

THE CHALLENGE

The main target of SYDDARTA is to develop a pre-industrial prototype for diagnosing the deterioration on movable assets by the acquisition of 3D-hyperspectral imaging through scanning non-destructive techniques.

Such images contain spectroscopic information of the piece to be analysed in different bands of the spectrum, giving chemical composition information of the different materials and layers in the actual 3D surface by means of a very narrow screening bandwidth and the use of volumetric digitalisation.

PROJECT OBJECTIVES

The purpose of SYDDARTA is to develop a prototype instrument for monitoring the deterioration of works of art and other heritage artefacts. This will be achieved by using "3D Hyperspectral imaging"; where hyperspectral images are acquired whilst simultaneously scanning the 3D profile of the object. Being optical, the technique will be non-invasive and therefore nondestructive.

The instrument will be portable and is intended for the monitoring and conservation of movable cultural assets. Furthermore, the instrument will reference databases of material (such as pigments) characteristics, enhancing the use of the system.

The merging of the two techniques will enable the fast in-situ scanning of cultural assets. The results will be digitised simplifying their transfer between cultural organisations across Europe, and thereby improving conservation.

The projected instrument may also be used as an additional tool for other applications such as authentication.

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METHODOLOGY

Analysis that must be done, will be performed combining mapping, spectroscopic and image processing techniques, based on tunable filters and customised light sources. The expected prototype will be a new portable type of equipment to use in the preventive conservation and monitoring of movable cultural assets and will provide enormous data sets by non-destructive characterisation techniques. Moreover, the equipment will make use a specific database of materials and pigments monitoring that will be exploited as well.

The merging of the technologies involved will be suitable for fast authentication and traceability of cultural assets and will improve the monitoring and conservation of artworks in general, as well as facilitating art digitalisation sharing between the cultural organisations across Europe. In addition, the expected project results will not be specific to the art and heritage cultural sector, and may be applied to other fields of research, engineering or industry, for example, for biomedicine, manufacturing, food industry, chemistry or recycling. This means a wider market impact and a greater societal benefit inside and out the European Union.

EXPECTED RESULTS

SYDDARTA addresses some of the environmental challenges of the 21st century as described in the European Commission's 7th Framework Programme. It will increase the knowledge, experience and technologies of European companies especially in the important field of conservation. This will enhance their competitiveness. The project will also increase the knowledge-base by the generation of data, not only of individual artefacts but also the formation of a database of materials that will be required as a background reference.

SYDDARTA will demonstrate a prototype instrument that may be used by conservators, that is a comprehensive tool that is simple to use. It will showcase an integrated solution at a competitive cost, which is effective in terms of ease of use by non-specialist operators, and will be suitable for many applications, including those "in the field".

SYDDARTA will provide a solution to analysing the chemical and physical deterioration in a non-intrusive manner and the process of degradation by providing data on the spectral signature and profile of an object. This data may also be used for authentication purposes. Any changes to these parameters, for example after cleaning or transport may thus be easily identified

PROJECT PARTNERS	
Industrial Association of Optics, Colour and Image (AIDO) (CO)	ES
AVANTES	NL
Delf University of Technology (TUD)	NL
Foundation for research and technology - Hellas (FORTH)	GR
Gooch & Housego (G&H)	GB
Institute for the Protection of Cultural heritage of Slovenia (IPCHS)	SL
Institute of Atmospheric Sciences and Climate (CNR-ISAC)	IT
Real Academia de Bellas Artes de San Fernando (RABASF)	ES
Signinum, Gestão de Património Cultural Lda.	PT
ViALUX	DE
XENICS	BE

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