

FOCUS K3D: Promoting Semantic 3D Media

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Keywords and topics: 3D content management, knowledge technologies, 3D media annotation, classification and retrieval, Semantic Web

Workshop scope

FOCUS K3D is an EU-funded Coordination Action that aims to exchange and disseminate novel ideas and techniques in the emerging research field of semantic 3D media. The project also focuses on identifying current issues on knowledge intensive 3D media, trace future research and technological directions, and establish new partnerships to promote innovative projects addressing a highly multi-disciplinary community, both from academia and industry: scientists not only in CG but in all the disciplines that make strong use of 3D modelling and simulation; professional developers of tools for 3D content creation and management; publishers/dealers of 3D repositories on line; creators of digital 3D content.

3D content is widely recognized as the upcoming wave of digital media and it is pushing a major technological revolution in the way we see and navigate the Internet. Beside the impact on entertainment and 3D web, the ease of producing and/or collecting data in digital form has caused a gradual shift of paradigm in various applied and scientific fields: from physical prototypes and experience to virtual prototypes and simulation. This shift has an enormous impact on a number of industrial and scientific sectors, where 3D media are essential knowledge carriers and represent a huge economic factor in many content sectors.

Thanks to the technological advances, we have plenty of tools for visualizing, streaming and interacting with 3D objects, even in much unspecialized web contexts (e.g., SecondLife). Conversely, tools for coding, extracting and sharing the semantic content of 3D media are still far from being satisfactory. Automatic classification of 3D databases, automatic 3D content annotation, content-based retrieval have raised many new research lines that represent nowadays some of the key topics in Computer Graphics and Vision research. At the same time, knowledge technologies, such as structured metadata, ontologies and reasoners, have proven to be extremely useful to support a stable and standardized approach to content sharing, and the development of these techniques for 3D content and knowledge intensive scenarios is still at its infancy.

Program (tentative)

Speaker: Bianca Falcidieno, CNR-IMATI, Italy

Talk title: From geometric to semantic 3D content: the FOCUS K3D initiative

Talk abstract:

The talk will introduce the activities and achievements of the recently started project FOCUS K3D on the topic of semantic 3D content. FOCUS K3D aims at bringing together researchers and industries in Europe that are capable of identifying the needs of the users regarding 3D shape knowledge representation and processing. Moreover, through its dissemination activities it will create awareness of the benefits deriving from

the re-use, and preservation of valuable scientific knowledge and resources in terms of 3D models, software tools for 3D manipulation and processing, ontologies and metadata.

Speaker: Michela Spagnuolo, CNR-IMATI, Italy

Talk title: Semantic characterization of 3D shapes

Talk abstract:

The volume of 3D media available on the web is increasing at an extraordinary speed, and methods to semantically annotate and effectively retrieving them will rapidly become a key issue in the upcoming panorama of multimedia content. In this context, the talk will give an overview of various techniques for segmenting 3D shapes that are at the basis of 3D media annotation, classification and retrieval.

Speaker: Michela Spagnuolo

Speaker: Manolis Vavalis, CERETETH, Greece

Talk title: Digital Heritage through Knowledge Management of 3D artifacts.

Talk abstract:

3D shapes occur and are used in many different domains of Digital Heritage and they play a central role in several important activities ranging from basic research in archaeology to practical reconstruction of monuments from ruins and the development of virtual reality systems for spectators.

There already exist a plethora of 3D models in Digital Heritage and a rapidly increasing number of related tools. These 3D models are usually of rather high quality and the associated tools quite advanced and complicated at times. It seems thought that in the new area of digitalized information, researchers in Cultural Heritage and Archaeology face a new problem: semantic data organization.

In this talk we present case studies where semantic technologies have the potential to be used to build robust real-life solutions based on existing and emerging ontologies and knowledge management. The aim of this study is not to actually report on the success (or failure) of existing usage scenarios but to focus on understanding what makes semantic knowledge applications successful in operational environments which involve 3D shapes in Digital Culture. In particular we focus on concrete usage scenarios that are associated with search, compare and retrieve, (semi)automatic annotation, effective acquisition and learning.

Speaker: Marios Pitikakis, University of Thessaly, Greece

Talk title: A semantic based framework for managing, searching and retrieving 3D resources

Talk abstract:

This talk will introduce the main outcomes of the AIM@SHAPE Network of Excellence focusing on the knowledge management techniques in visual media with the aim of making explicit and sharable the knowledge embedded in multi-dimensional media (3D content). It will also demonstrate the Digital Shape Workbench (DSW), an infrastructure which incorporates software tools, visual media databases, and a digital library, all built on the basis of suitable ontologies and metadata. DSW is a common framework for reasoning, searching and interacting with the semantic content related to a knowledge domain.

Roundtable discussion