

*Events*

# UID PhD Summer School *Cultural Heritage Survey and Inclusive Representation*

Giuseppe Amoruso

The University of Trieste hosted, from 24 to 28 September 2018 at the Gorizia University Pole, the first PhD Summer School of the *Unione Italiana per il Disegno* on survey of cultural heritage and inclusive representation dedicated to advanced doctoral training in the disciplines of representation [1].

The Summer School introduced participants to the practice of the most advanced tools and methodologies for the analysis, documentation and communication of cultural heritage. In addition, the participants were able to apply digital representation workflows in the field of scientific knowledge and dissemination, with particular attention to accessibility of collections and their effective and universal fruition.

As evidenced by the initiative's subtitle, *advanced communication and tactile representation of cultural heritage for museum accessibility*, activities had to face the resolution of operational problems related to the historical and artistic heritage survey exhibited in the museum spaces; the workflow has to be oriented to an overall strategy for relevant datasets exploitation, in terms of communication and visual diffusion through digital systems and of accessibility and experience for

people with reduced sensory capacity. The use of new three-dimensional technologies, advanced computational applications, rapid prototyping and use through haptic interfaces is today a methodology that requires the development of specific skills.

For museum systems, digital technologies are renovating values and knowledge for dissemination of their heritage and collections, no more exclusively intended for scholars or exhibited as an extensive collection of items, that reduces the possibility of interaction and the real learning engagement by visitors.

The *UID PhD Summer School Programme* was inaugurated by an open conference at the National Archaeological Museum of Aquileia, entitled *Cultural Heritage Survey and Inclusive Representation for Museum Accessibility*. The Vice-President of the *Unione Italiana per il Disegno*, Mario Centofanti, explained, according to the Society policy, the reasons for a choice and the investment in training and applied research through the education of young graduate students from several universities. Mario Docci, Sapienza Università di Roma, introduced different topics according to the initiative contents and presented a lecture on the role of 3D virtual models

for conservation and enhancement of architectural and archaeological heritage. Giuseppe Amoruso, Politecnico di Milano, presented the digital reconstruction hypothesis of the Roman amphitheatre in Milan, a process of geometric modeling that uses generative techniques starting from the survey of the survived foundation *septa* to simulate the geometric and architectural construction of the building. An innovative, procedural technique applied for the first time to the archaeological heritage representation and which opens the way for future applications of an experiential nature to be integrated with direct communication on the site.

Numerous case studies were also presented by experts in the field such as Marta Novello, director of the National Archaeological Museum of Aquileia, for accessibility in the renovated museum layout which exhibits the antiquities of the ancient Roman city and the archaeological area, inscribed to the *World Heritage of Humanity* (Unesco) since 1998. In particular the exhibition highlights the sculptures of the Julian-Claudian imperial cycle as well as the numerous portraits of the ancient inhabitants, which ideally introduce visitors to discover the ancient city.

**PHD SUMMER SCHOOL**  
 AQUILEIA-GORIZIA 24-28/9/2018  
 Unione Italiana per il Disegno

Università degli Studi di Trieste  
 Dipartimento di Ingegneria e architettura  
 Polo Universitario di Gorizia

con  
 il Museo Archeologico Nazionale di Aquileia  
 e l'Ordine degli Architetti, Pianificatori,  
 Paesaggisti e Conservatori della Provincia di Udine

*Open Conference*

**RILIEVO DEI  
 BENI CULTURALI E  
 RAPPRESENTAZIONE  
 INCLUSIVA PER  
 L'ACCESSIBILITA'  
 MUSEALE**

**Lunedì 24 settembre 2018**  
 ore 9.00 - 18.30

Museo Archeologico Nazionale  
 di Aquileia, Sala centrale

Via Roma, 1  
 Aquileia



Ilaria Garofolo, University of Trieste, pointed out issues on the regeneration quality of places, landscape or architecture on inclusive design for accessibility and cultural heritage. A contribution to address the solutions that improve the fruition of culture in a universal way, through formal and technological devices for the elimination and mitigation of physical and perceptive constraints. Elisa Perego, University of Trieste, presented some best practices on the role of audio-visual translation to improve the usability of art works, an area of accessibility and research of audio-visual translation quite neglected, in order to identify the critical features of copywriting and relate them to current literature and guidelines.

The research of Ivana Passamani, University of Brescia, from optical communication to haptic communication of information on landscape and architecture for visually impaired users has not yet had an effective procedural and graphic systemization; for this reason a 'code system' is needed both for three-dimensional and two-dimensional templates, for which methodologies and crafting techniques must be identified.

Aldo Grassini, director of the National Tactile Museum *Omero* of Ancona, brought his decades of experience on the discovery of tactility values to promote the integration of people with visual impairment. The museum offers technical and scientific support to public institutions, charities and private people and designs installations and accessible temporary exhibitions with dedicated aids for the blind and visual-

ly impaired. Grassini reminded that art needs senses and all the world around to transform it into an authentic aesthetic experience. Touch, the most ill-treated among the senses but also the less known, hides unimaginable resources if one begins to consider it without prejudice and to seriously test its potential.

Even Loretta Secchi, from the Tactile Museum *Anteros* of Bologna, has directed her contribution towards the mysterious and yet so natural universe of touching with the eyes and seeing with the hands. In particular Secchi highlighted how important the cognitive and cognitive functions of aesthetic education are to reach the goal of multi-sensoriality.

Christina Conti, University of Udine, presented the experience applied to the National Archaeological Museum of Aquileia aimed at transforming the conventional visit and learning from the exhibition into multisensory, educational and pedagogical experiences that involve and make all visitors participating actively regardless of age, from the cultural education and physical and sense-perceptive skills.

In the field of virtual reconstructions for the use of the archaeological areas of Aquileia, Cristiano Tiussi of the Aquileia Foundation, presented the *Aquileia 3D* project: all the reconstructions of the urban settlement of the ancient Aquileia are accessible through an application that contains the animations of its symbolic places and landmarks (forum, river port, markets, amphitheatre, republican walls etc.), the interactive exploration of all archaeological areas, in-depth information sheets and 60 static virtual reconstructions.

Fig. 1. Flyer of the event.



Fig. 2. Open conference of the Summer School.

Pedro Manuel Cabezos Bernal, from Universitat Politècnica de València, presented a current digital museum application for the enhancement of cultural heritage. *Structure-from-Motion* photogrammetry makes it possible to document the heritage through 3D models that can be shared on repository platforms and explored through different visualization modes. This implies a great advancement for the enhancement of the heritage through a virtual museum, as in the case of the Romanesque capitals of the cloister of the monastery of San Cugat, where

the study of their symbolic forms highlighted the relationship between form, artistic solution and the possible theories related to sacred music. The contribution of Silvia Grion, member of Italia Nostra, addressed the issue of accessibility to cultural heritage; coordinator of the *Gorizia conTATTO* project, for a more accessible cultural heritage to the blind and visually impaired, illustrated the ongoing projects in collaboration with the Department of Engineering and Architecture of the University of Trieste: the design of a tactile map of the Castle of Gorizia with table in

Braille characters (by Paola Cochelli) and the installation of a tactile map at the Church of Sant'Ignazio (by Veronica Riavis).

The seminar was concluded with the presentation of Alberto Sdegno, promoter and coordinator of the initiative, on the tactile replica perception of sculptures with new technologies. In collaboration with the Coronini Foundation of Gorizia and Italia Nostra, the 3D printing of the two Franz Xaver Messerschmidt heads kept at the Foundation was created. The research showed the surprising images of the acquisition phases of the sculptural heads and then in detail the prototyping and printing process. Participants and professors of the PhD summer school continued to develop field applications at the Archaeological Museum of Aquileia and at the University of Trieste labs in Gorizia [2]. Several survey sessions have been carried out with the use of structured light laser scanning systems, the latest generation precision scanners and photographic sampling for SfM photogrammetry applications (*Agisoft Photoscan* and *3DF Zephyr* softwares). In particular, the 3D scanning and photomodeling tests were carried out on Roman sculptures and then developed with dedicated applications. At the end of prototypes production and reconstruction phase, some tests were operated and the 3D prints validated the geometric accuracy and the quality of the digital models and process outcomes. Particular attention has therefore been paid, more generally, to issues relating universal design and accessibility, fruition by users with reduced sensory capacity and new visualization technologies.

## Notes

[1] The summer school was promoted by the Unione Italiana per il Disegno, the University of Trieste, Department of Engineering and Architecture and by the PhD Programme in Civil-Environmental Engineering and Architecture between the Universities of Trieste and Udine and also in collaboration with the National Archaeological Museum of Aquileia. It was patroned by the Ordine degli Architetti, Pianificatori, Paesaggisti e Conservatori of the Province of Udine and it was realized as part of the *UID-Survey and*

*Representation Days-Specialistic seminars in the disciplines of Drawing for PhD students.*

[2] Teachers: Giuseppe Amoruso (Politecnico di Milano), Pedro Manuel Cabezas Bernal (Polytechnic University of València), Alberto Sdegno (University of Trieste)– coordinator. Tutor: Silvia Masserano. Steering committee: Barbara Chiarelli, Paola Cochelli, Silvia Masserano, Veronica Riavis. PhD students: Antonio Camassa (University of Roma Tre), Barbara Chiarelli (University of

Trieste), Paola Cochelli (University of Trieste), Sara Eliche (University of Genoa), Francesca Guadagnoli (Sapienza University of Rome), Andrea Improta (University of Campania 'Vanvitelli'), Gianluca Manna (University of Campania 'Vanvitelli'), Sofia Menconero (Sapienza University of Rome), Sandra Mikolajewska (University of Parma), Carla Mottola (University of Campania 'Vanvitelli'), Margherita Pulcrano (University of Naples 'Federico II'), Veronica Riavis (University of Trieste), Pablo Angel Ruffino (Politecnico di Torino).

## Author

Giuseppe Amoruso, Department of Design, Politecnico di Milano, giuseppe.amoruso@polimi.it