International Summer School in Archaeology

"3D MODELING IN ARCHAEOLOGY AND CULTURAL HERITAGE"

http://www.3darchaeology.org

Monte Verita, Ascona, Switzerland, 9-14 MAY 2008

Swiss Federal Institute of Technology (ETH) Zurich
Institute of Geodesy and Photogrammetry
Chair for Photogrammetry and Remote Sensing
Zurich, Switzerland

University of Siena
Department of Archaeology and History of Arts
Laboratory of Landscapes Archaeology & Remote Sensing
Siena, Italy

B. Kessler Foundation
Center for Scientific and Technological Research
3D Optical Metrology Group
Trento, Italy

University of California Merced
School of Social Science, Humanities and Arts
Merced, CA, USA

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The International Summer School in Archaeology

The International Summer School in Archaeology is a well-established interdisciplinary event. These events represent an important occasion to establish contacts between experts in archaeology, cultural heritage, art history and experts from remote sensing, photogrammetry, CAD, spatial information science, computer graphics, virtual reality, etc. The School emphasizes international composition of the audience, extended discussions between participants and direct relationships between lecturers and students, which ultimately could lead to joint projects.

The organizing institutions have longstanding experiences in the preparation of international scientific events. The Summer Schools of the last decades dealt with themes which have created important initiatives and international debate aimed at advancing archaeological work in Europe and beyond. In general the Schools emphasize an interdisciplinary concept, involving the use of techniques from natural, geo- and engineering sciences in archaeology and natural/cultural heritage.

General objectives of the Summer School

- To encourage the integration of theoretical, methodological and analytical aspects of archaeological research.
- To develop interdisciplinary research and practice, by bringing together researchers and users in the natural, geo- and engineering sciences, using advanced information acquisition and processing techniques, supported by work in the laboratory.
- To promote a dialog between workers in different fields, particularly between those concerned with research and those more concerned with matters of conservation.

Scientific Committee

- Prof. Dr. Armin Gruen - Institute of Geodesy and Photogrammetry, Swiss Federal Institute of Technology (ETH) Zurich, Switzerland
- Dr. Fabio Remondino - Institute of Geodesy and Photogrammetry, Swiss Federal Institute of Technology (ETH) Zurich, Switzerland; B. Kessler Foundation, Trento, Italy
- Dr. Stefano Campana – University of Siena, Department of Archaeology and History of Arts, Laboratory of Landscape Archaeology & Remote Sensing (LAP&T), Siena, Italy
- Dr. Maurizio Forte – University of California Merced, CA, USA; CNR-ITABC, Roma, Italy

Summer School Secretariat

Matteo Sordini (University of Siena, LAP&T Lab)
Liliane Steinbrueckner (ETH Zurich)

Information

WEB site - www.3darchaeology.org
Official e-mail address for contact - info@3darchaeology.org

State of the art and aims of the Monte Verità Summer School

Nowadays our cultural and natural heritage is under constant threat and danger. Architectural structures and cultural and natural sites are exposed to pollution (air pollution, acid rain, birds, etc), tourists, wars as well as environmental disasters like earthquakes, floods or climatic changes. Hidden cultural heritage (under the earth's surface or those partially visible above ground as earthworks, industrial sites, etc.) are affected by agriculture (vineyards, olive cultivation, erosion processes), change of agricultural regimes due to economical change, mining, gravel extraction, construction of infrastructures (roads, railways), and built-up of industrial areas.

The available technologies and methodologies for digital recording of archaeological sites and objects are promising and the heritage community is trying to adapt these approaches for detailed 3D documentations. Indeed 3D modelling could be extremely powerful to improve

identification, monitoring, conservation and restoration. At the landscape scales, digital 3D modelling and data analysis allow archaeologists to integrate, without breaks, different archaeological features and physical context and better document the area. At the monuments/sites scale, 3D techniques can give accurate measurements and objective documentation as well as a new aspect under a different point of views. At the artefact scale, 3D modelling allows to reproduce accurate digital/physical replica of every artefact that can be studied, measured, displayed, etc. as well as data for general public use, virtual restoration and conservation.

In archaeology the systematic and correct use of 3D models for documentation and conservation started just recently, but it is still lacking applications for different reasons:

1) the "high costs" of 3D techniques
2) the difficulties in producing good 3D models
3) the misconception that it is only an optional tool for interpretation (an additional "aesthetic" factor)
4) the difficulty to integrate 3D worlds with other 2D data and documentations
5) the episodic use of 3D models for scientific analyses.

Our School will face and discuss these problems, giving participants the opportunity to obtain a detailed overview of the main methods and applications to archaeological and conservation research and practice. Furthermore, our School will give the chance to participants to enter in a very short time the kernel of the scientific discussion on 3D technologies– surveying methods, documentation, data management and data interpretation - in archaeological research and practice.

Profile or the organizers

Swiss Federal Institute of Technology (ETH) Zurich - Chair of Photogrammetry and Remote Sensing – http://www.photogrammetry.ethz.ch

ETH Zurich is the number one-rated Technical University in Europe. Its Chair of Photogrammetry and Remote Sensing of the Institute of Geodesy and Photogrammetry has a longstanding experience with digital recording and modeling techniques, especially in application to cultural and natural heritage. The group has conducted projects in Ayers Rock (Australia), Bamiyan (Afghanistan), Nasca, Pinchango Alto, Chichictara, Tucume and Machu Picchu (Peru), Xochicalco (Mexico), Bayon, Angkor (Cambodia), Ayers Rock (Australia), Mount Everest, Lalibela (Ethiopia), The Weary Herakles in Antalya (Turkey), Pfyffer Relief in Luzern,, Khmer Head in the Rietberg Museum of Zurich, A. Escher Statue in Zurich, St. Gallen Globus, Zürich 1800 city model (Switzerland). The group of Prof. Gruen has much experience in organizing international congresses, seminars and schools.

University of Siena - Laboratory of Landscapes Archaeology & Remote Sensing (LAP&T) – http://www.lapetlab.it and http://archeologia.medievale.it

The Laboratory, established by Prof. Riccardo Francovich and Stefano Campana, has great experience and skills in archaeological cartography projects and is considered to be among the most sophisticated in Europe. The Laboratory is keen to promote the combined use of new and established methods of survey, each supporting the others in the exploration and interpretation of carefully chosen heritage landscapes in Tuscany. From its inception in 1999 the Laboratory has promoted and managed (in partnership with prestigious national and international research institutions such as the Italian National Research Council, English Heritage, the Universities of Cambridge, Durham and Vienna) a number of important schools and workshops. These have included Schools on Remote Sensing in Archaeology (1999), Aerial Archaeology Research (2001 and 2005), Geophysics for Landscapes Archaeology (2006), Archaeological visibility (2006). The lab has also organized several international workshops.

B. Kessler Foundation - 3D Optical Metrology Group – http://www.fbk.eu/irst

The Bruno Kessler Foundation (FBK), formerly called ITC (Istituto Trentino di Cultura) is a research institute with more than 40 years of international researches and results. Within its divisions and group, the 3DOM (3D Optical Metrology) group carries out R&D activities on advanced integrated imaging sensors and Cultural Heritage 3D documentation. Among the most recent projects, the 3D-ARCH project (in collaboration with the National Research Council of Canada) is aiming at the 3D virtual reconstruction of complex architectures from different data sources.

International Advisory Board

J. Bourgeois (University of Gent, Belgium) - P. Bryan (English Heritage, UK) - D. Cowley (AARG, UK) - V. Failmetzger (US Navy) - M. Gojda (Czech Academy of Sciences, Prague) - D. Grossman (University of Ljubljana, Slovenia) - M. Guaitoli (University of Lecce, Italy) - M. Hernandez (UNESCO, Paris, France) - C. Musson (AARG, UK) - A. Malpica (University of Granada, Spain) - Sh. Murai (University of Tokyo, Japan) - F. Piccarreta (II University of Naples, Italy) - A. Pedrotti (University of Trento, Italy) - M. Reindel (DAI, Bonn, Germany) - Y. Takase (CADCenter, Tokyo, Japan; Ritsumeikan University, Japan) - P.R. Williams (Chicago Field Museum, USA)

Location of the Summer School

The School will be held in the congress centre Centro Stefano Franscini, Monte Verità, Ascona, Switzerland. The centre is an ETH-affiliated seminar complex located in a superb botanical park on the historic and cultural Monte Verità area, which will also be the residence of the participants with its integrated hotel and restaurant. Monte Verità is overlooking the picturesque village of Ascona and Maggiore lake and it offers many possibilities for catching a glimpse of the Swiss Canton Ticino, famous for its scenery and lively beauty.

Accommodation

The centre provides 26 double rooms and 19 single rooms located in 3 buildings, plus 3 rooms in Casa Amicizia (Monescia). Most of the bedrooms have a bathroom with shower, telephone, radio and a minibar, while for few cases one bathroom is shared between two rooms. Organisers, lecturers and participants will stay at the Centro throughout the School.

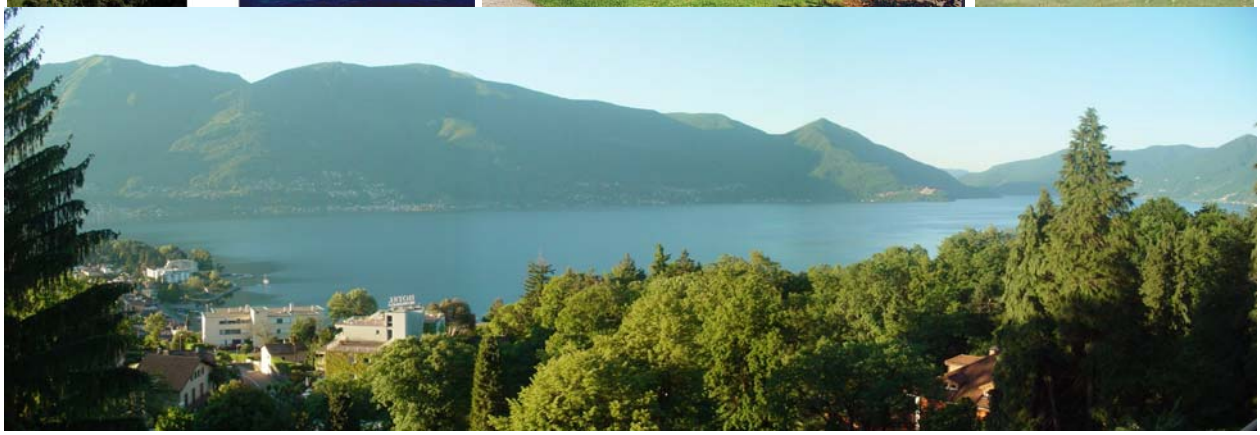
Organisation

- The length of the School will be from Friday 9th to Wednesday 14th May 2008
- Lessons will be interspersed with theory, examples and demos
- Number of lecturers: about 20
- Number of participants: about 60
- The official language of the School is English
- Half-day excursion to the UNESCO castles in Bellinzona

Participants

The School will be open to ca 60 participants at graduate level, to those carrying out doctoral or specialist research, to established research workers, to members of State Archaeology Services and to professionals specialising in the study and documentation, modeling and conservation of the archaeological heritage.





Costs

Registration fee: **EURO 650**, including accommodation and meals (full board) at the centre, proceedings on CD and hardcopy, coffee breaks, icebreaking party and excursion. The registration form will be available soon online. The deadline for the registration is 31st March, 2008.
There will be available also some grants offered by UNESCO and ISPSR to support students with limited budgets. More info will be available soon online.

Teaching sessions

The lecturers will describe the principles and practices of 3D technologies, with special focus on the use of remote sensing, photogrammetry, laser scanning and other data acquisition techniques, 3D modelling, mobile GIS, visualization, Virtual Reality and the use of related software.

Preliminary Program

Friday - May 9

from 10:00	**ARRIVAL & REGISTRATION**
12:30-14:00	**Lunch**
14:00-14:30	Welcome & Introduction – *A.Gruen, F. Remondino, S.Campana, M. Forte, M. Hernandez*
14:30-15:00	UNESCO Initiatives and Projects – *M. Hernandez*
15:00-16:00	Methodology of the archaeological research, requirements and needs – *S. Campana, A. De Guio*
16:00-16:30	**Coffee break**
16:30-18:00	Geomatics technologies for archaeology and Cultural Heritage: an overview – *A. Gruen*
18:30-19:30	**Icebreaking party**
19:30	**Dinner**

Saturday - May 10

8:30-10:00	Introduction to Virtual Heritage – *M. Forte*
10:00-10:30	**Coffee break**
10:30-12:00	Satellite and aerial photogrammetry – *A. Gruen*
12:00-12:30	UAV photogrammetry – *H. Eisenbeiss*
12:30-14:30	**Lunch**
14:30-16:00	Terrestrial photogrammetry – *F. Remondino*
16:00-16:30	**Coffee break**
16:30-17:30	Status and developments of archaeometry in Japan – *Sh. Murai*
17:30-18:00	Sponsor presentation
19:30	**Dinner**

Sunday - May 11

9:00-10:30	Terrestrial laser scanning and structured light – *G. Guidi, D. Akca*
10:30-11:00	**Coffee break**
11:00-12:00	Laser scanning and visualization of sculptures, monuments and sites – *Y. Takase*
12:00-12:30	Sponsor presentation
12:30-14:00	**Lunch**
14:00	**EXCURSION**

Monday - May 12

8:30-10:00	Technology and applications of Lidar in archaeology – *M. Doneus*
10:00-10:30	Sponsor presentation
10:30-11:00	**Coffee break**
11:00-12:30	3D landscape analysis and geoarchaeology – *P. Mozzi*
12:30-14:30	**Lunch**
14:30-16:00	GIS in archaeology, Cultural and Natural Heritage – *M. Sauerbier, K. Lambers*
16:00-16:30	**Coffee break**
16:30-17:30	BMBF Project Nasca: Development and adaptation of archaeometric techniques for research in archaeology – *M. Reindel*
17:30-18:00	Sponsor presentation
19:30	**Dinner**

Tuesday - May 13

8:30-9:15	DGPS in archaeology – *S. Campana*
9:15-10:00	Aerial photogrammetry: the archaeological point of view – *G. Ceraudo*
10:00-10:30	**Coffee break**
10:30-12:00	Visualization & animation – *T. Hanusch*
12:00-12:30	Sponsor presentation
12:30-14:30	**Lunch**
14:30-15:30	Reconstruction and VR/Web-visualization of lost cultural heritage (old cities and castles) – *Y. Takase*
15:30-16:00	Sponsor presentation
16:00-16:30	**Coffee break**
16:30-17:00	Virtual ecosystems for the transmission and communication of cultural heritage – *E. Pietroni*
17:00-17:30	Ancient landscape reconstruction (data interpretation and web interaction) – *S. Pescarin*
17:30-18:00	Laser scanning in the archaeological excavation – *M. Peripimeno*

18:00-18:30	Sponsor presentation
19:30	**Dinner**

Wednesday - May 14

8:30-10:00	Multispectral image analysis – N.N.
10:00-10:30	**Coffee break**
10:30-12:00	Airborne and Satellite Radar applications – N.N.
12:00-12.30	**CLOSING**
12.30-14.30	**Lunch (optional)**

Excursion

Half a day will be dedicated to the visit of the UNESCO World Heritage site of Bellinzona, with its medieval castles.



Activities before and after the Summer School

The cities, towns and villages of Ticino offer a wide variety of options for leisure activities. In this region of Switzerland, May is ideal for exploring the countryside, visiting the alpine valleys and its beautiful lakes. Hiking and touring are much favoured and visitors can enjoy the unique experience of life in the landscapes and local eating-places of Ticino. Why not take a few days of holiday before or after the Summer School?

We also invite participants to stop over at our Laboratories at ETH Zurich, in order to have a close look at our work. Please contact Liliane Steinbrueckner (ETH Zurich), stein@geod.baug.ethz.ch and have a look at our homepage www.photogrammetry.ethz.ch/general/map.html for directions on how to reach our Labs.