

Session 11. Mountains of data: Digital mountain archaeology in global perspective

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Room 11

Introduction 09:00 - 09:15

12. High mountain archaeology in central South Norway 09:15 - 09:40
Uleberg and Matsumoto*

88. Archaeological predictive modelling of alpine pastoralism: A case study in the Orobic Alps, Italy 09:40 - 10:05
Croce; Carrer and Angelucci*

103. Detecting and interpreting fossorial marks in mountainous environment: From ground surveys to UAV prospections 10:05 - 10:30
Magnini, Bettineschi, Michielin, Chiarini, Venco and De Guio*

Tea/Coffee

113. Continuity and discontinuity: Creation of a predictive model for the study of the landscape from Middle Age to the Great War in Valsugana Valley, Trento, Italy 11:00 - 11:25
Pedersoli and Azzalin*

117. Valmaron Valley: A First World War logistics centre above the Venetian Prealps, Italy 11:25 - 11:50
*Azzalin**

151. Rescuing Rosalila: 3D scanning of complex archaeological tunnels for conservation efforts in Honduras 11:50 - 12:15
Richards-Rissetto, Wood, Wittich, Agurcia Fasquelle, Garza Roldan and Tuarez*

Lunch

164. Non-invasive approach to Ancestral Pueblo settlement studies: Results of archaeological investigations in the Canyons of the Ancients National Monument, Colorado, USA 13:30 - 13:55
Szczepanik, Zych, Palonka and Przybyła*

Discussion 13:55 - 14:10

Introduction

According to the United Nations Environment Programme – World Conservation Monitoring Centre, mountains cover more than one quarter of the Earth's land surface (Rodríguez-Rodríguez et al., 2011). The fragility of these ecosystems and their exceptional historic-archaeological

potential are constantly threatened by natural hazards, human-induced climate changes (Fort, 2015), and by an increasing loss of biocultural diversity (Agnoletti & Rotherham, 2015).

On one side, modern socio-economic pressure is causing the abandonment of wide mountainous areas, their pastures, and of long-established forest management systems, which are seldom replaced by adequate monitoring strategies (Dax et al., 2021). On the other, mass tourism and the economical attractiveness of mountain resources are leading to an uncontrolled exploitation of the local environment (Taczanowska et al., 2019), increasing the risk of destruction both for traditional landscapes and archaeological remains.

Despite the enormous variability in mountain environments, archaeologists working in such contexts have to face specific challenges, including – as applicable – dense afforestation, inaccessibility, significant erosion, altitude and temperature-related technical issues which require proactive mitigation and contingency measures (Carrer et al., 2020; Caspari, 2021; Pelisiak et al., 2018).

In this framework, the opportunities offered by digital methods constitute a fundamental help for contributing to a sustainable identification, documentation, monitoring, and management of the montane cultural record (Brogiolo et al., 2012). The recent advances in hardware solutions, and sensor typology, resolution, and portability are constantly improving the potential of remote/ near sensing and 3D modelling for earth observation and field prospection of mountainous areas (Lambers, 2018; Reinhold et al., 2016; Stek, 2016). Artificial intelligence is further pushing the computational power of such approaches, offering an efficient system to process huge amounts of data in relatively short timeframes (Chen et al., 2021; Magnini et al., 2017; Sărășan et al., 2020). Furthermore, the development of dedicated predictive models using advanced spatial methods and ontological reasoning is contributing to identify and protect endangered archaeological contexts (Magnini & Bettineschi, 2021; Märker & Heydari-Guran, 2010; Stirn, 2014; Visentin & Carrer, 2017).

This session constitutes an opportunity to disseminate the most promising results of the digital heritage community in the field of mountain archaeology and welcomes case studies, methodological developments, and position papers. The main topics can include (but are not limited to):

- Aerial and satellite remote sensing from local to global scale, including advanced image enhancing & data processing techniques, and spatial analyses for site detection and settlement pattern identification;
- UAVs and other autonomous vehicles in extreme mountain environments;
- Predictive and Agent-based modelling for the spatio-temporal modelling of human/ landscape interactions;
- Artificial Intelligence (broadly defined) and big data;
- Digital methods for risk management, heritage protection, land use/ land cover/ land change assessment;
- 3D modelling for the documentation and communication of mountain cultural heritage, including design of Augmented/ Virtual, and Enhanced Reality experiences.

References

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