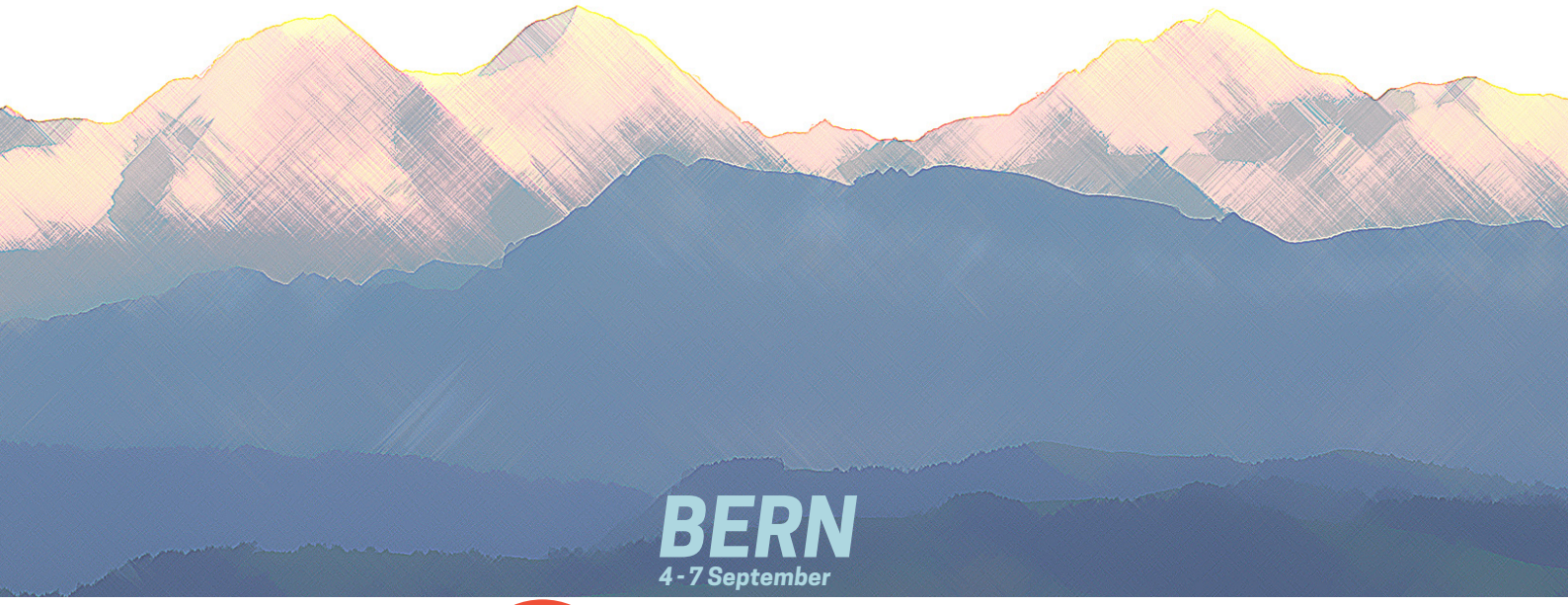
EAA 2019

25 years

Beyond paradigms



European Association of Archaeologists (EAA) 25 years

Abstract Book

resolution, without geometrical distortions, including its third dimension and without the influence of a subjective factor. Also, work with the rock drawings in the field could be non-invasive and less time-consumed, and the results of the laboratory work would become reproducible on the basis of primary photographic materials. Having a three-dimensional model, it is possible to create a side-illumination of a drawing with program methods, programmatically measure the parameters of an object, including the depth of the mark, etc.

To represent three-dimensional models, a specialized information system in the web was developed with 3d-viewer based on the open source three.js library. Using such a self-written software product, it is possible to make a flexible adjustment of the functionality and design of the information system, including the implementation of an individual role-based data access model, tools for analyzing archaeological images in 3D form, etc. At the core of the data storage model there is modern and one of the most lightweight 3D formats – Draco from Google Open Source.

This work was supported by the Russian Science Foundation (project 18-78-10079).

4 PEOPLE OF LEPENSKI VIR: SHARING AND CARING FOR THE 3D OSTEAOARCHAEOLOGICAL RECORD

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Presentation Format: Oral

In the past years, means of acquisition of 3D information became all present - the requirements to successfully create an accurately reconstructed copy of an object in 3D dramatically plummeted and made the process broadly available to both professionals and enthusiasts alike. The IBM (Image Based Modelling) on it's basic levels required only a camera and some overcast sky or studio light, to have your site, your trench or a newly uncovered artifact, preserved as accurately scaled digital copy, for as long as the storage units would hold the data. The more important question has been treated as of late - what to do with created models, and what value do they add to the research work, if any?

Project "People of Lepenski Vir: protocols for digitalization of bioarchaeological heritage" used number of techniques to capture and store 3D data of the osteoarchaeological record from Danubian gorge, dated to Mesolithic and Neolithic period. Laboratory for Bioarchaeology aimed to provide open access to the so created 3D models. In order to enrich the experience, basic functions of metric data collection, surface model visualizations, model section analysis were added; but more importantly a robust database structure was created and populated to provide for metadata for each scanned fragment of bone. This structure allowed for further expansion of the collection, to other sites and periods.

In this paper, we present experiences gained, with special note on the benefits of having an open access to 3D collections of the archaeological material, for the purposes of education and information exchange.

5 THE USE OF 3D TECHNOLOGIES IN THE STUDY OF CAVE ART IN KAPOVA CAVE

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Presentation Format: Oral

Kapova cave is situated in the Southern Urals, and it is a unique cave in Russia with reliable Upper Paleolithic wall paintings. It is a limestone karst cave with three hypsometric levels. Radiocarbon dating of archaeological layers in the cave showed the interval between 19500 and 16000 BP.

Archaeological excavations have revealed traces of different short-term human activity in the cave, which were expressed in symbolic and daily practices. 3D-modelling of these findings along with photogrammetry could be applied here to study them post-factum, create a broad digital catalogue for both scientific and popularization purposes.

First of all, the study of wall paintings based on their 3D-models created possibilities for comparison, relief analysis and understanding of compositional principles. 3D-models allowed the authors to work with all images at once, comparing them to each other. Usually it is impossible due to the fact that all images are very distant from each other and photos do not provide an overall view of all characteristics. This enabled to make new conclusions in documenting the images in the Chamber of Sings and the Chamber of Paintings.

Secondly, this approach has been applied to the «stone blockage» - a new studied object in the Dome Chamber of the cave. It consists of a large amount of stones of various size, where plaquettes and stones with ocher, concentrations of clay or ocher and some other archaeological artefacts were found. Some fragments of plaquettes with ocher stains fit each other. 3D scanning allowed to combine all parts of a slab together and reveal the characteristics of the initial surface and ocher, which was put on it.

Thus, 3D technologies can be applied to all types of practices in caves and be irreplaceable method of office finds study.