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BOOK OF ABSTRACTS

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THE APPLICATION OF PHOTOGRAMMETRIC ORTHOMOSAICS FOR DOCUMENTATION OF PALAEOLOGICAL SITES

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Fieldwork is crucial in palaeontological studies. Both when the fossils are being exposed from the site and when they are studied in situ. Therefore, an exhaustive documentation of these remains and their reciprocal position within the rocks are necessary for further study, including taphonomical, palaeoecological, and systematical analyses. For this purpose, a powerful, non-invasive methodology, based on Structure from Motion (SfM) algorithms was used to create orthomosaics and 3D reconstructions. Documentation of fossil features was performed through 2D photographs taken from multiple angles and with sufficient overlap and coverage. A series of individual photos matched up to constitute a new composite image or orthomosaic, in which the geometric distortion was corrected and orthorectified, such that the scale was uniform. The orthomosaic allowed a rapid and reliable documentation of the outcrops than conventional methods (i.e. drawings, total station). It reproduces a precise orthogonal X-Y scheme of the site and can be used to measure true distances and surfaces. During excavations, it is advisable to generate an orthomosaic before and after the extraction of each fossil to subsequently analyze the overlapping information. Thus, by adding the vertical (Z) information, three-dimensional positions of all the remains can be reconstructed during the excavation works, and quite precise 3D taphonomic maps can be obtained. The generation of photogrammetric orthomosaics turned out to be an effective, rapid and cost-effective tool for checking and correcting the relative and absolute position of fossils within a site, and complementing the traditional information obtained during palaeontological field trips.