The photogrammetry as a tool of virtual palaeontology based on the *Canis familiaris* skull: advantages and disadvantages

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One of the most resourceful technics used by virtual palaeontology is the fossils studying through three-dimensional digital visualisation based on the multiply two-dimensional images obtained at various viewpoints (Sutton et al. 2014). One of the most remarkable methods is considered to be a photogrammetry. It is a method for determining the 3D surface topography of an object using a digital camera for capturing photographs. In palaeontology, photogrammetric technique has originally been used to image skeletons and footprints of dinosaurs (Bates et al. 2009; Stoinski 2011). However, the latest studies have demonstrated the possibility of this method for analysing a much wider range of fossil taxa and biological material of extant organisms (Falkingham 2012; Medina et al 2020; Cunningham 2021). Here, we have studied the advantages and disadvantages of photogrammetry and 3D modelling software as Meshroom (free of charge software) and Agisoft metashape (non-free software) based on the complete skull of *Canis familiaris* stored in the Sociedade de História Natural (SHN). As a result, photogrammetry is the cheapest method but also the slowest from the data collection to its processing in the software. Depending on the complexity of the studied object and the chosen resolution of further 3D model, it will require from 16GB to 32GB of RAM just to work in the basic configuration and over 128GB in extreme configuration for processing larger datasets. Also, the accuracy of the model is lower and colour of surface is captured with an error due to its shape depth. Hence, this method is the best suited for solid macrofossils (not microfossils) with a regular morphology of the outer surface.

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