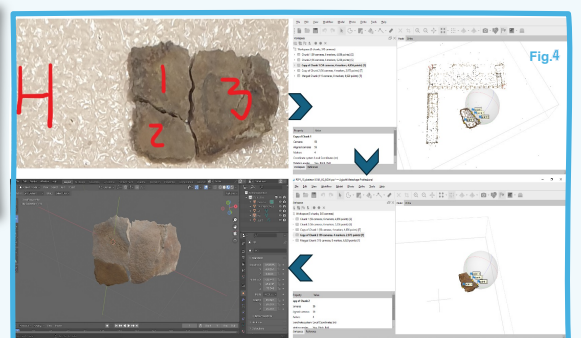
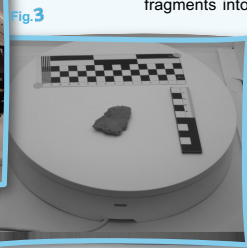
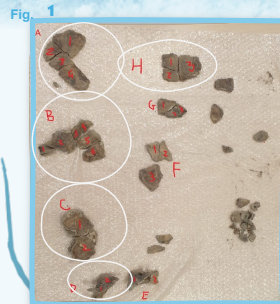
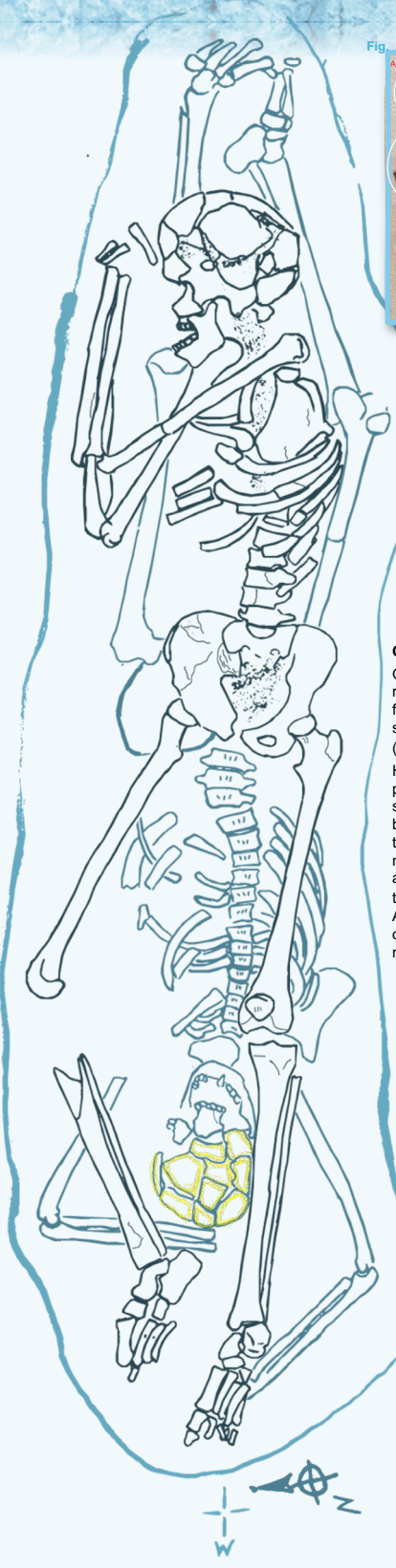


# In the Lab: The Use of Photogrammetry as a Means of Digital Reconstruction and Preservation of Fragmented Human Remains

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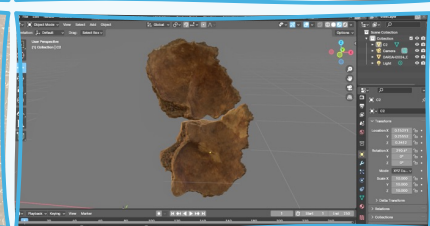
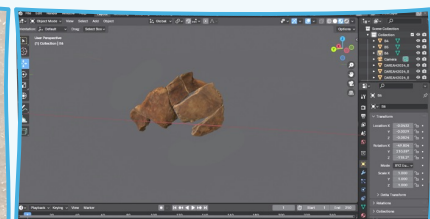
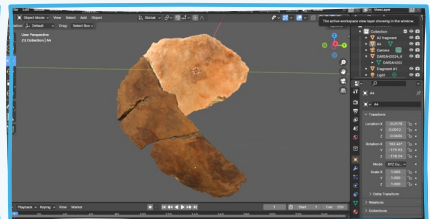
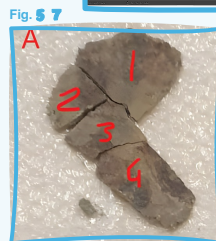
## Outcome

Out of a total of 25 cranial fragments that could be reassociated in the laboratory, 22 3D models were created, from which a partial neurocranium was reconstructed, showcasing the possibilities of this line of reassembling (Fig.5-7 exemplifies some of the models).

However, due to the high level of fragmentation, the process was time-consuming, with additional challenges such as a lack of identified landmarks on the fragments and blurry photos taken manually had to be deleted, impairing the final models' accuracy. Despite these challenges, the measurements taken for the digital models confirm an accurate reconstruction of the fragments, when compared to the measurements from the original fragmented remains. Although partial, the 3D model allows a glimpse into the original cranial morphology. Please use QR to access ALL models.



SCAN ME



This case study shows that digital 3D reconstruction significantly contributes to the preservation of human remains through non-destructive means, while raising the potential for scientific and educational dissemination of case studies - making education and research more equitable. Also, the validation of digital models, by way of comparison of measurements with the original skeletal elements, shows that faithful reproduction can be achieved, thus reinforcing their scientific potential.

Although the 3D presentation of human remains allows for a better balance of scientific value and protection of fragile remains, it also raises ethical considerations that must be at the forefront of this technological development. For example, storing and accessing reconstructed remains should be appropriately and conscientiously managed; the same applies to displaying the dead in a respectful and dignified manner - these were people once, and caution is needed since we do not know the manner and circumstances of life and death. Issues on ownership and consent are also paramount and need urgent discussion.

In line with these concerns, we have chosen to only make images available for a limited amount of time in research-forthcoming contexts. In the future we are interested in exploring ethical modalities of making both models and workflows accessible to a larger audience.

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## References

- [1] AgiSoft PhotoScan Professional (Version 1.8.0) (Software). (2021). Retrieved from <http://www.agisoft.com/downloads/installer/>
- [2] Community, B. O. (2018). Blender - a 3D modelling and rendering package. Stichting Blender Foundation, Amsterdam. Retrieved from <http://www.blender.org>

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