## TOWARDS A MORE ROBUST REPRESENTATION OF LITHIC INDUSTRIES IN ARCHAEOLOGY: A CRITICAL REVIEW OF TRADITIONAL APPROACHES AND MODERN TECHNIQUES

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## Dear Authors,

You perfectly present the issues involved in the graphic representation of lithic artefacts, then follow up with a fine state of the art. You present your RTI experience and compare with drawing, photography and photogrammetry. The illustrations are very eloquent.

However, a few points need to be clarified, partly to expand the subject and make it clearer and more accessible to novices. As a frequent user of photogrammetry and RTI, I disagree with some of the technical decisions made. However, it is mainly a case of 'squabbling' over working methods. I sometimes feel that the discussion is too Manichean, photogrammetry vs RTI. It would be useful to emphasise the complementary nature of the two techniques. It may also be interesting to discuss about web viewers and web distribution. All these comments are listed.

This work will help neophytes and contribute to the dissemination of new technologies within the community of prehistorians and beyond. Thank you for this very interesting preprint.

## Line 202: 3.1. Photography

The problem of optical distortion needs to be mentioned.

The Prehistorians community didn't use transparency to combine images taken in different lighting conditions?

Line 232: Why only « small objects »? It's not a question of size, but of the surface/thickness ratio.

Line 296: « $\in$ 3000 ». What does this prize mean? «Nikon D850 DSLR camera combined with a fixed focal length 60mm Nikon macro lens and a GODOX AR400 ring flash »? Line 719 - « a camera and lens costing around  $\notin$ 750 each ». Why this difference? If the  $\notin$ 1,500 difference is for flash and 3D software, please explain.

Line 297: « CT scans » Why tomography for lithic tools? Are you speaking about laser scanning?

Line 298: Please, develop a little bit about photogrammetry softwares. You mention Colmap in the text, but Metashape in the legend of Figure 7. Advantages and drawbacks of each. Figure 6: Metashape?

Line 320: « a nearly constant distance from the digitized surface ». Which one?

Line 323: Number of shots?

**Line 389:** « minimal times ». In my opinion, this technic requires between 48 and 72 pics to create a smooth \*rti file. Time consuming is equivalent in terms of acquisition compared to photogrammetry. The main difference is postprocessing.

« low cost » for manual acquisition, but this kind of acquisition is time consuming and not precise for the position of light.

Line 411-412: « from which it initially contacted the surface ». Sorry, but I don't understand.

Line 433: Semi-automatic system, very easy to produce: Porter *et al.* 2016: https://doi.org/10.1016/j.jasrep.2016.07.013 Openhardware: HASOR open RTI: https://mbouhier.github.io/HASOR/introduction/

**Line 455:** « A black, reflective sphere is placed near the subject.» Why not talk directly about 2 or 3 spheres as mentioned in figure 8 and line 510?

Line 468: « A 5 cm scale marker is positioned near the subject, at the focus level ensuring that the artifact remains completely still—even at the micron scale—to prevent calculation errors and the creation of a blurry model. » Do you want to say to control after acquisition if dataset is usable?

Line 497: « The lens focus is also adjusted manually (you can use the camera's digital zoom to finetune the focus with precision) » You can use autofocus, the main point is to disengage it afterwards.

Line 500: « complete darkness ». In my experience, it's better to create low diffuse light to avoid over and underexposures.

Line 504: "Additionally, a single photograph is taken with a lighting angle close to 90° » Not orthodox. Please explain why.

Line 508 / 509-510: « The reflective sphere should be placed next to the subject, but not too close to avoid casting shadows that could distort calculations » « To mitigate potential errors caused by grazing light, it is advisable to use two spheres placed on opposite sides of the subject. If one sphere is obscured by the object's shadow, the other will remain well-lit. » You have to place item surface on the same elevation as the sphere.

Line 518: It's useless, everything is online.

https://github.com/ExeterDigitalHumanities/rti/blob/main/RTI%20processing%20with%20RelightLab %20v2.pdf

Line 533: Very clear, but it could be great to present possibility to create some bookmarks, a useful tool to transfer to colleagues.

Line 578: « directory ». Please crop figure 9 and it could be great to include bookmarks.

Line 587: « Photographic acquisition: also around 5 minutes.» « Each view is made up of approximately 50 to 100 photos »: 300 secondes / 50 shots = 6 secondes. 300 / 100 = 3 secondes. So it means you spend between 6 and 3 seconds per shots. In my opinion, it's unrealistic.

Line 600: « 700 megabytes »: less if you crop before to export.

Line 674 - Figure 10: Maybe move it up one page?

 Table 1 – Photography + Focus stacking + RTI. Include « optical distortion » in disadvantages.

- « RTI + Relight, RTI Viewer, et Photoshop ».
- « 3D Photogrammetry Processing ». Long, but scripts can decrease time consuming for 3D model edition.
- « **Disadvantages Sensitive to capture conditions** »: like RTI, but you can create good diffuse light and use cross polarisation filters.