Peer Community In Archaeology

A new software to improve standardization and quality of data in zooarchaeology

Florent Rivals *based on peer reviews by* ***Argant Thierry*** *and* ***Delphine Vettese***

Emmanuel Discamps (2020) TIPZOO: a Touchscreen Interface for Palaeolithic Zooarchaeology. Towards making data entry and analysis easier, faster, and more reliable. Missing preprint_server, ver. Missing article_version, peer-reviewed and recommended by Peer Community in Archaeology. https://doi.org/10.31219/osf.io/aew5c

Submitted: 16 April 2020, Recommended: 28 May 2020

Cite this recommendation as:

Rivals, F. (2020) A new software to improve standardization and quality of data in zooarchaeology. *Peer Community in Archaeology*, 100001. 10.24072/pci.archaeo.100001

Published: 28 May 2020

Standardization and quality of data collection are identified as challenges for the future in zooarchaeology [1]. These issues were already identified in the early 1970s when the International Council for Archaeozoology (ICAZ) recommended to "standardize measurements and data in publications". In the recent years, there is strong recommendations by publishers and grant to follow the FAIR Principle *i.e.* to "improve the findability, accessibility, interoperability, and reuse of digital assets" [2]. As zooarchaeologists, we should make our methods more clear and replicable by other researchers to produce comparable datasets. In this paper the authors make a significant step in proposing a tool to replace traditional data recording softwares. The problems related to data recording are clearly identified and discussed. All the features offered by TIPZOO allow to standardize the data, to reduce the errors when entering the data, to save time with auto-filling entries. The coding system used in TIPZOO is based on variables taken from the most used and updated literature in zooarchaeology. Its connections with various R packages allow to directly export the data and to transform the raw data to produce summary tables, graphs and basic statistics. Finally, the advantage of this tool is that it can be improved, debugged, or implemented at any time. TIPZOO provides a standardized system to compile and share large and consistent datasets that will allow comparison among assemblages at a large scale, and for this reason, I have recommended the work for PCI Archaeology.

References:

[1] Steele, T.E. (2015). The contributions of animal bones from archaeological sites: the past and future of zooarchaeology. J. Archaeol. Sci. 56, 168–176. doi: [10.1016/j.jas.2015.02.036](https://dx.doi.org/10.1016/j.jas.2015.02.036)

[2] [https://go-fair.org/fair-principles/](https://www.go-fair.org/fair-principles/)

Reviews

Evaluation round #1

DOI or URL of the preprint: https://osf.io/aew5c

Authors' reply, 28 May 2020

Download author's reply
Download tracked changes file

Decision by Florent Rivals, posted 25 May 2020

Minor revision required

Dear Dr. Discamps,

Thanks you for submitting your preprint to the PCI Archaeology. I apologize for the delay in the review process. I have now received the feedback from two reviewers, and after reading your manuscript and the comments, I agree that your paper is of interest for the zooarchaeology community. Standardization is discussed since long time, and TIPZOO offers a huge step forward in standardizing and sharing the data.

The reviewers are suggesting some minor corrections to improve your paper. I just would like to suggest few additional details: - In the introduction, in the list of problems you could also consider the issues related to the experience of the zooarchaeologist. For example for young researchers, the way the data are recorded may drift significantly from the beginning to the end of their PhD. That could be included in point 1 or 2. - In the discussion, it would be interesting to add a short paragraph on future perspectives for TIPZOO. Maybe it would be interesting to integrate data for specific analyses on the bones, such as stable isotopes, tooth microwear, cementum analysis, geometric morphometrics among others, to have all these data linked in the same database. Just a suggestion.

I am looking forward to receive your revised manuscript.

Best regards

Florent Rivals

Reviewed by Argant Thierry, 26 April 2020

Download the review

Reviewed by Delphine Vettese, 23 May 2020

Review: The manuscript "TIPZOO: a Touchscreen Interface for Palaeolithic Zooarchaeology. Making data entry and analysis easier, faster, and more reliable?" presents new software solutions to simplify and standardize the zooarchaeological data recording and analyses. This seems a worthy goal and the software solutions can be used by zooarchaeologists to compare easily faunal assemblages. After layout the biases, errors and problems faced by the zooarchaeological data record the author presents the different tools composing the Tipzoo

and key feature of the software system. Finally, the author presents a short discussion of the exploitation of software solutions. That is why I recommend this manuscript for publication with minor revisions but I suggest some changes to help to improve the manuscript. I find this paper useful and necessary for the reasons exposed by the author, however, I noticed some issues easily addressed. Please find the comments and suggestions by paragraph I list below. Moreover, English is not my mother tongue; I do not consider myself able to judge the grammatical syntax of this text. However, the manuscript is clear and understandable.

Introduction The knowledge of the zooarchaeological field, of the way to record data and analyses them allow a clear listing of the main misuses of spreadsheet software more often used by zooarchaeologist.
1-> Some of the coding system presented by the author are complex. Moreover, the coding system in zooarchaeology can differ according to the language, change according to the researchers or research progress. Maybe, it could be useful to detail why selected these coding systems and not a less complex one. 2 -> I would like to precise that software like excel, for example, allow having data validation to control data recording. 3 and 4 -> I agree with the problems exposed.

Tipzoo general overview It is a good presentation of the interlink between the software solutions proposed and well-illustrated, maybe it could be useful to specify the data transfer format between them.

Tipzoo key features The different arguments listed explain clearly the features, which simplify the data recording. 3 -> Regarding the objective scale chose to record taphonomic surface modification, it could be interesting to specify in this paper the scale used, i.e. the expansion of the alteration on the bone remain surface (1/3, 2/3...). 4 -> It is great to have “short descriptive texts” and “illustrations” to help the user. It could be necessary if the user is a beginner in the discipline and, as remarked bellow, for the student. Moreover, hiding the irrelevant layout simplify and accelerate the data recording and prevent some errors during the record. 7 -> I suggest grouping this paragraph with paragraph 9: Touchscreen recording of skeletal landmarks, because, in my opinion, they present a similar idea. 8 -> I am wondering if it will be possible to link the location of cutmarks with Q-GIS software? 12 -> I understand the importance of highlight the real-time verification, but I suggest grouping this point with -> 6: Dynamic display. In the last part regarding the analysis features: 1 -> Regarding R environment, it could be useful to specify that it is possible to use it without Filemaker, based only on spreadsheet software. The R codes could simplify also the analyses and could be the first approach to use the software solutions presented in this paper. That is even more, because Filemaker is not free software, and it is possible from previous database record on spreadsheet software that zooarchaeologists could standardize the analyses. I noticed in the R-table French version, provided with Tipzoo-R, numerous errors, probably due to the French accent from Filemaker to spreadsheet software. Maybe, in the discussion, it could be interesting to specify the strength of the R environment by comparison with the package zooRch (Otárola-Castillo et al. 2016). 2 -> The Q-GIS exploitation could be extended to spatial analyses and maybe regarding the anthropic or carnivore mark distributions (e.g.: Parkinson et al. 2014, 2015; Stavrova et al. 2019)? I am wondering if an application in the future, the refits data could be analysed with R for calculating easily the distance and with Q-GIS to contextual integration of the refit with spatial analyses (faunal assemblages and all archaeological remains). Because the author specify the unique ID-refit attribution, but it seems for now unused.

Discussion I would appreciate having more discussion about the choice of the criteria and publication chosen for the software solutions. Moreover, I appreciate to have a presentation of the additional criterion will be selected. Maybe, a discussion more detailed about the other tries to systematize the data record and analyses and their failure to highlight the strength and benefit of the solution proposed. I suggest adding the number of users and their experience in the zooarchaeological field (beginner or expert) to highlight the advantages of software solutions developed. This discussion is central in this article because it could be easy, to sum up, the manuscript at a software solutions presentation as advertising and could lose its impact.

In sum, this manuscript and the software solutions are a welcome contribution to the constant effort to standardize the record and analyse of zooarchaeological data. I guess the software solutions proposed will be used and allow to compare better dataset between Palaeolithic sites.

Bibliography: Otárola-Castillo, E., Wolfhagen, J., & Price, M. (2016). zooaRch: An R Package for Zooar-

chaeological Analyses. Parkinson JA, Plummer T, Hartstone-Rose A (2015) Characterizing felid tooth marking and gross bone damage patterns using GIS image analysis: An experimental feeding study with large felids. J Hum Evol 80:114–134. doi: 10.1016/j.jhevol.2014.10.011 Parkinson JA, Plummer TW, Bose R (2014) A GIS-based approach to documenting large canid damage to bones. Palaeogeogr Palaeoclimatol Palaeoecol 409:57–71. doi: 10.1016/j.palaeo.2014.04.019 Stavrova T, Borel A, Daujeard C, Vettese D (2019) A GIS based approach to long bone breakage patterns derived from marrow extraction. PLoS One 14:e0216733. doi: 10.1371/journal.pone.0216733