

Tools for the Revolution: developing packages for scientific programming in archaeology

Joe Roe <joe@joeroe.io>, University of Copenhagen
Martin Hinz <martin.hinz@iaw.unibe.ch>, University of Bern
Clemens Schmid <schmid@shh.mpg.de>, MPI-SHH

Standard session proposal for CAA2021, Cyprus

Organised by the *Scientific Scripting Languages in Archaeology* special interest group (SIG-SSLA)

Abstract

The increasing use of scientific programming languages (e.g. R or Python) is transforming the practice of quantitative archaeology. This “tool-driven revolution” (Schmidt and Marwick 2020) promises to greatly improve the accessibility, power, and reproducibility of computational analyses. It is a core component of the “Third Science Revolution” (Kristiansen 2014), which has major theoretical and practical implications for the discipline of archaeology as a whole.

But a tool-driven revolution dies without robust and versatile tools. As inveterate methodological borrowers, we can frequently rely on implementations in other fields, but the adoption of scripted analysis also reiterates the long-established need for methods designed specifically for archaeological data and archaeological problems (Kintigh 1987; Aldenderfer 1998). Recent years have seen a proliferation in packages developed by and for archaeologists (e.g. <<http://open-archaeo.info/>>). An increasing number of computational archaeologists therefore find themselves not only in the role of analyst, but also that of a ‘research software engineer’ (Baxter et al. 2012); not just using tools, but making them. The distinct set of skills and practices this role demands has not yet been widely discussed within the field, but establishing what constitutes ‘good’ software engineering in archaeology is vital if we are to ensure that our new tools do what they say they do, work together, can be maintained over the long term, and are accessible to the broadest possible community of archaeological practitioners.

This session, organised on behalf of the CAA-SIG “Scientific Scripting Languages in Archaeology,” will survey the state of the art in archaeological packages for R, Python, and other scientific programming languages. We invite technical or theoretical papers on:

- critical reviews of software support for specific domains of analysis
- discussions of future priorities for package development in archaeology
- general concepts in package development as applied to archaeology (e.g. user interface design, unit testing, continuous integration, software peer review)
- new packages or significant updates to existing ones

The session is aimed at both developers, users, and prospective users of scientific programming languages in archaeology. A companion workshop on package development for beginners is also planned.

References

- Aldenderfer, Mark. 1998. “Quantitative Methods in Archaeology: A Review of Recent Trends and Developments.” *Journal of Archaeological Research* 6 (2): 91–120.
- Baxter, Rob, N Chue Hong, Dirk Gorissen, James Hetherington, and Ilian Todorov. 2012. “The Research Software Engineer.” In *Digital Research 2012*, Oxford.
- Kintigh, Keith W. 1987. “Quantitative Methods Designed for Archaeological Problems.” In *Quantitative Research in Archaeology: Progress and Prospects*, edited by Mark S Aldenderfer, 126–34. Newbury Park, CA: Sage.
- Kristiansen, Kristian. 2014. “Towards a New Paradigm: The Third Science Revolution and Its Possible Consequences in Archaeology.” *Current Swedish Archaeology* 22 (4): 11–34.
- Schmidt, Sophie C, and Ben Marwick. 2020. “Tool-Driven Revolutions in Archaeological Science.” *Journal of Computer Applications in Archaeology* 3 (1): 18–32. <https://doi.org/10.5334/jcaa.29>.