

Data Science is the Science of Data: What that means for archaeology and why we need it now!



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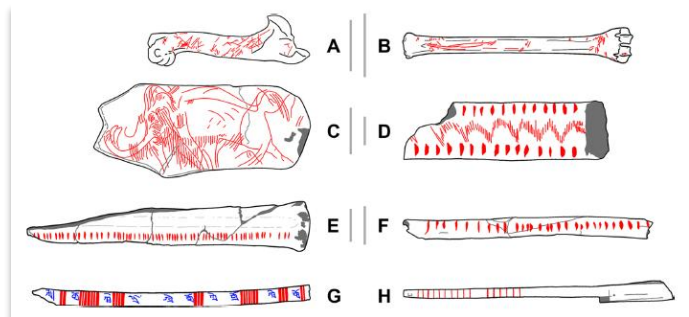
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Data science has become one of the fastest-growing domains across the sciences over the past decade, driven in large part by advances in artificial intelligence (AI) and computational learning. While the popularity of AI has dominated public discussions, the broader field of data science, concerned with how data are collected, structured, modelled, analysed, and visualised, offers an underexplored wealth of possibilities for

archaeological research. My work focuses on applying mathematical, statistical, and probabilistic tools to archaeological and palaeoanthropological datasets. Archaeology faces unique challenges, including extremely small, incomplete, and fragmented records, as well as the increasing dependence on complex “black-box” computational models whose internal logic is often opaque. In this talk, I will outline how I have been addressing these challenges through a set of complementary research programmes: from augmenting and completing palaeoanthropological datasets, to investigating the mathematical structure of the iso-parameters used in use-wear and microwear analysis. Together, these efforts illustrate how an explicit, rigorous archaeological data science can help us better understand the past—and the tools we use to study it.



Examples of different types of materials and engravings.
Source: Courtenay *et al.*, 2025.