Beyond Tradition in Archaeological Research: Confluence of Old Technologies and New Ideas

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Abstract

Technological means hinder an inherent tactical and continuous advancement. By mentioning a specific type of technology our mind may be backtracked to the origins of the development of it and regardless of the fact that this may go back years ago, it is still applied in different ways. Despite the practical application of different technological means for years, we are still used to refer to “new” technologies. One wonders if this is the right terminology or if we are getting outdated in terms of being accustomed and maybe even confined with well-established methodologies and tools.

Many of the scientific and technological tools that have been use in the past in the course of archaeological investigations have gone through a long trajectory and they are still used systematically from the research community. Is it proper though to still refer to them as “New Technologies” or is it that “New Ideas” are responsible for keeping these technologies at the fridges of state-of-the-art? This paper will examine the latest developments of spatial technologies applied in archaeological research, both in terms of infrastructure and areas of applications, indicating the reasons supporting the stand that we can still talk about “New Technologies”.

Areas of New Technologies / New Ideas

Geophysical Prospection

Geophysical prospection has undergone various stages of evolution since the 70s and 80s and its current trends are moving ahead promoting the automation of the scanning systems either with drone based sensors or robotic platforms (Verhoeven, 2018). They are also pushing the envelope by exploring “difficult” environments such as caves or the littoral zone.

Data-Driven Science

Following the new scientific paradigm of data intensive science, new methodologies have been also developed to process Big Data originating from different sources and move forward to a more automated process of segmentation, classification and interpretation (Davis, 2020, Green, 2023). Lidar, aerial, and satellite images are especially prone to such kind of analyses with AI and ML techniques to be increasingly applied to such datasets and images (Argyrou and Agariou, 2022).

Spatial Analyses Methods

In spatial analysis, GIS has been observed to fall aside in the main core of conferences, as it is mainly used in a conventional way. On the other hand, there are so many areas or research, both in terms of analysis and areas of interest, that remain untouched or even unexplored. In terms of analyses, there are a number of alternative investigations (e.g. the analysis of least cost surface using the Tobbler's Hiking function, or Focal Mobility Network, the From Everywhere to Everywhere analysis or the Spatial Design Network analysis) which in most cases they have not been compared in terms of their effectiveness. Similarly, the combination of other analyses such as space syntax, 3D visibility and acoustic analysis can deviate us from the comfort of well-established landscape analysis and provide a more cognitive meaning to the landscape (Sarris, 2023).

New Applications of GIS Spatial analyses

It is also the application of spatial analyses in new domains. Let us take a few examples. Digital History and cultural landscape archaeology, especially when applied to more recent historical phases remains poorly explored (Chetzogiannaki and Sarris, 2022). The social and cultural elements of the past have not been thoroughly examined and there are just a few cases dealing with the particular dynamics. Even more, there are just very few cases that have addressed the topic of the spatial distribution of the habitation of caves, the modelling of maritime mobility, the palaeoenvironmental reconstructions, the Deep mapping of impressions and feelings of past travelers, the social inequality and power structure of ancient societies, and others.

Final Remarks

Technologies have been adopted to the archaeological research since the early 20th century and they have been adapted to address specific archaeological questions. Despite their long history of integration, there are still new developments in hardware, software and areas of application that allow us to continue encounter them as "New" Technologies. This is not because of the technologies *per se*, but mainly because of the new needs arising from the archaeological and historical research, the new questions emerging, and the new frontiers that need to be explored. It is the "New" ideas that retain the "Old" Technologies to an innovation state.

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