ULUSLARARASI SOSYAL ARAŞTIRMALAR DERGİSİ
THE JOURNAL OF INTERNATIONAL SOCIAL RESEARCH

Uluslararası Sosyal Araştırmalar Dergisi/The Journal of International Social Research
Cilt: 16 Sayı: 105 Ekim 2023 & Volume: 16 Issue: 105 October 2023
Received: Oct 03, 2023, Manuscript No. jisr-23-118404; Editor assigned: Oct 06, 2023, Pre-QC No. jisr-23-118404 (PQ); Reviewed: Oct 20, 2023, QC No. jisr-23-118404; Revised: Oct 26, 2023, Manuscript No. jisr-23-118404 (R); Published: Oct 31, 2023, DOI: 10.17719/jisr.2023.118404
www.sosyalarastirmalar.com ISSN: 1307-9581

Crafting History in 3D: Maltese Prehistoric Architecture

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Abstract

Malta's prehistoric architecture is a unique testament to the ancient world's architectural prowess. The megalithic temples, hypogea, and cart ruts scattered across the Maltese archipelago have fascinated archaeologists and historians for centuries. The lack of written records and the erosion of time have made studying and preserving these ancient structures a challenging endeavor. In recent years, 3D modeling has emerged as a powerful tool in understanding, preserving, and interpreting Maltese prehistoric architecture. This article explores the multifaceted role of 3D modeling in shedding new light on these architectural marvels, enabling virtual restoration, aiding in interpretation, engaging the public, and fostering collaborative research.

These digital replicas are, at the same time, a virtual environment that can be used as a tool for the interpretative hypotheses of archaeologists and as an effective medium for a visual description of the cultural heritage. In this paper, the innovative methodology and aims and outcomes of a virtual reconstruction of the Borg in-Nadur megalithic temple, carried out by Archeomatica Project of the University of Catania, are offered as a case study for a virtual archaeology of prehistoric Malta.

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Introduction

Malta, a small archipelago nestled in the heart of the Mediterranean, boasts a history dating back thousands of years. Among its most striking features are the prehistoric architectural wonders that dot the landscape. These architectural gems include the megalithic temples, hypogea, and cart ruts, all of which challenge our understanding of ancient engineering, construction, and cultural practices. Yet, preserving, studying, and interpreting these structures have posed significant challenges. Fortunately, the advent of 3D modeling has opened new avenues for researchers to unlock the secrets of Malta's prehistoric architecture.

Their importance lie in the four main steps of the archaeological process: fieldwork, recording, interpreting, and dissemination of results. Although during an excavation the technological applications are mainly restricted to the use of laser scanners and 3D GIS, where archaeologists can be considered as mere "users", in the moment of decoding ancient data and in the subsequent phase of encoding and simplifying them, research strategies and goals of archaeology and computer science may converge [4]. In this perspective, the digital solution appears today as the most successful strategy for passing on our shared heritage to future generations.

Preservation through 3D Modeling

Preservation is a paramount concern when dealing with prehistoric architecture. The relentless forces of time and nature can erode these ancient structures. 3D modeling provides a solution by enabling the creation of highly accurate digital replicas. These replicas serve as invaluable references for the physical restoration and conservation of the original structures. Researchers can experiment with different restoration scenarios in the virtual realm, ensuring that the best preservation practices are implemented on-site.

Interpretation of Prehistoric Structures

One of the most fascinating aspects of 3D modeling is its ability to aid in the interpretation of these ancient sites. Without written records, understanding the purpose and function of prehistoric structures can be challenging. 3D models help researchers simulate and visualize different hypotheses. For instance, they can investigate how sunlight interacts with temple entrances during solstices, shedding light on possible astronomical and religious significance. Additionally, researchers can virtually reconfigure stone blocks to explore different construction methods and architectural designs.

Public Engagement and Education

The power of 3D modeling extends beyond the academic sphere. These digital models have the potential to engage and educate the public. Virtual tours and interactive exhibits allow individuals to explore these ancient sites from the comfort of their homes or within museums. Schools can integrate 3D models into their curricula, fostering a new generation's appreciation for Malta's prehistoric heritage. By making history more accessible, 3D modeling bridges the gap between academia and the wider community.

Collaborative Research

3D modeling has also facilitated international collaboration among researchers. Digital models can be shared and accessed by scholars from around the world, promoting a more comprehensive understanding of Malta's prehistoric architecture. The exchange of knowledge and expertise allows for a more holistic approach to the study of these ancient sites.

Future Prospects

The integration of 3D modeling into the study of Maltese prehistoric architecture represents a promising future for archaeology and historical research. As technology continues to advance, we can expect even more detailed and interactive models, providing new insights into the mysteries of Malta's distant past. The ongoing collaboration between archaeologists, historians, 3D modelers, and the public promises to unlock the secrets of these ancient structures and ensure their preservation for generations to come.

Conclusion

In conclusion, 3D modeling has emerged as a transformative tool in the study of Maltese prehistoric architecture. By enabling virtual restoration, aiding in interpretation, engaging the public, and fostering collaborative research, it has opened new avenues for researchers to craft history in 3D. As technology continues to advance, the rich tapestry of Malta's prehistoric architecture is set to unravel further, revealing new insights into the past and ensuring that these architectural marvels endure for generations to come.

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