Underwater Digital Exploration of Poompuhar using 3D Reconstruction of Submerged Features/Artifacts

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ABSTRACT

Poompuhar, also known as Kaveri poompattinam, which is situated in Mayiladuthurai district of Tamilnadu, is an ancient old port city, which got submerged in the sea around 300 A.D. This paper endeavors to contribute to the recreation and preservation of submerged artifacts and objects within Poompuhar, a significant archaeological site submerged underwater. Leveraging cutting-edge imaging technology and sophisticated processing techniques, the paper embarks on a comprehensive reconstruction journey. Using a remotely operated vehicle (ROV) equipped with specialized underwater cameras, it meticulously capture high-resolution images of the submerged environment, including artifacts and structures. These images undergo rigorous preprocessing, including denoising and dehazing, to enhance their quality and clarity, ensuring optimal input for subsequent analysis. Subsequently, employing feature extraction techniques and point cloud generation algorithms, this creates a comprehensive 3D model of the underwater scene. Utilizing the capabilities of 3D Zephyr, this model is refined through the generation of dense point clouds, mesh creation, and texture mapping. Each stage of the reconstruction process is meticulously executed, ensuring a detailed and accurate representation of the submerged artifacts and structures. Through the collaborative efforts, the aim is to shed light on the historical significance of Poompuhar and contribute to the ongoing efforts in uncovering and preserving its cultural heritage. By recreating submerged artifacts and objects with precision and fidelity, the understanding of ancient civilizations is enriched and pave the way for further exploration and research in underwater archaeology. In summary, this paper stands as a testament to the power of interdisciplinary collaboration and technological innovation in unlocking the mysteries of the past and preserving our cultural heritage for future generations.

KEYWORDS :

3D reconstruction, Denoising, Dehazing, Artefacts, Ocean Archaeology, Submarine Research.

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