DEATH GAMES: Exploring the Békés 103 Cemetery Using 3D Technology

BAKOTA Project

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BACKGROUND

In recent years, 3D modelling has become an important tool in the preservation, analysis, and distribution of archaeological data. This technology also benefits from the potential of making archaeological information more widely available to the general public.

The goal of this project was to develop an interactive 3D environment based on the Békés 103 cemetery in the Békés region of eastern Hungary. This environment allows users to navigate the site in the first person while examining the burial practices of the Bronze Age people who populated this site.

For this study, 3D models of exposed cremation urns and restored vessels were created using a combination of photogrammetry and video production techniques.

One of the objectives of this project was to experiment and discover an efficient methodology and workflow in the creation of 3D archaeological environments—this is often an emerging and interdisciplinary field of study.

METHODS

- Reconstructed urns were photographed in front of a green screen using a 3-point light system.
- Using Autodesk’s AfterEffects software, we were able to export animated masks, layering, retouching, and color correction on these image sequences. These video production techniques allowed us to recolor the green background in an efficient manner.
- A colour background was created that served as an input alpha channel.
- Photoscan Pro was used to convert photographs into high-resolution 3D objects.
- These 3D objects were later edited in AutoDesk Maya and MeshMixifier.
- Using the game engine Unity, and following a map of the Békés site, a virtual landscape of the Békés site was created.
- 3D urns and graves were placed within the virtual environment.
- Two different viewing options were developed for the environment: ground view, and restored urn with additional information using Unity’s code language.
- The game was trouble-shooted.

WORKFLOW

Figure 3 A series of photographs of a reconstructed urn taken in front of a green screen.

Figure 2: Green screen is removed in AfterEffects. A clean Alpha channel/ mask is created.

Figure 5: Initial Terrain in Unity.

Figure 6: Preliminary placement of graves and urns.

Figure 4: The terrain of the Békés site is imported into Unity.

Figure 7: 3D urns are imported into Unity.

Figure 8: Other geometries are placed in the environment. Different urns are developed.

Figure 9: Additional geometry (grass, trees) are placed. Lighting is modified.

CONCLUSIONS AND FUTURE RESEARCH

Even if it’s early, archaeology has the potential to offer new perspectives on the archaeological research. These tools also provide an innovative platform for engagement with a wider public. Using an interdisciplinary approach, that combines archaeology, computer science, photography, and visual effect techniques, our team has developed a new way to experience the Békés site. Through trial and error, we have also been able to streamline and make more efficient our process.

Future work:

- The game needs additional refinement and troubleshooting.
- Additional 3D models of local flora need to be added.
- The “gene” needs to be tested with an audience.
- A website needs to be developed to host the “game”.

Once online, we need to analyze the impact and additional traffic on the BAKOTA website.

We need to conduct a survey to understand how this work is received and why.

Finally, we need to have discussions surrounding the preservation of digital information in an age of rapid obsolescence.

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BIBLIOGRAPHY


