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Augmented Reality localization technology for Ancient Greek Heritage Exploration and Preservation

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CirculAR, an innovative Augmented Reality (AR) application, introduces a gamified and engaging user-environment interaction, creating a unique platform for the exploration of Ancient Greek cultural heritage. Through a blend of educational and entertaining elements, CirculAR immerses end-users in an interactive experience, leveraging localized simulation technology and visual detection to augment information and present three-dimensional (3D) models at two prominent archaeological sites and a museum.

The AR application seamlessly integrates with the existing infrastructure of archaeological sites, enhancing the overall visitor experience by providing appealing and enjoyable interactions. CirculAR's distinctive features, including visual and audio descriptions, content manipulation, virtual tours, and a virtual agent, contribute to an inclusive and accessible immersive encounter for on-site users. The app incorporates gamified and educational components such as quizzes, animations, visualizations, and scoring mechanisms to enrich the learning experience.

Moreover, CirculAR extends its impact beyond visitor engagement by offering an authoring tool with a user-friendly interface addressed mainly to institutions, research centers, and organizations. This tool empowers content owners to preserve, curate, and disseminate their cultural heritage data effectively. Augmented storylines within the application faithfully replicate ancient sites, drawing on 3D content design and extensive research conducted by museums and archaeological sites.

CirculAR's immersive nature, emphasizing archaeological elements, is positioned to contribute significantly to highlighting existing components and recovering missing fragments crucial for a comprehensive understanding of historical areas. The application aligns with long-term strategic approaches for resilience and sustainability of historical monuments by seamlessly integrating with established infrastructure and supporting the preservation and dissemination of cultural heritage data. By fostering engagement, education, and preservation, the application supports cultural heritage management and proves a valuable tool for heritage conservation and public

awareness.

CirculAR has been tested and evaluated as part of internal testing procedures; evaluating how external parameters (such as, the change of scenery, lighting, angle, and positioning affect the localized content). The application will be tested and evaluated in real-life settings the upcoming spring at the three selected locations. Part of the future advancements of CirculAR include its evolution into formidable crowdsourcing tool, leveraging enhanced algorithms and user participation to collaboratively map climate change and natural hazards affecting cultural heritage sites. This transformation will empower a diverse and interconnected user base to collectively generate valuable insights, fostering a sense of shared responsibility and innovation.

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