

3D simulation technique of Buddha Park in the Lao People's Democratic Republic supporting virtual tours

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Abstract: This study presents the development of a 3D simulation technique for the Buddha Park (Wat Xieng Khuan) in the Lao People's Democratic Republic, designed to support virtual tourism. Utilizing photogrammetry and 3D modeling software, the research digitally reconstructs the park's iconic Buddhist and Hindu sculptures and architectural layout with high geometric and textural fidelity. The methodology integrates terrestrial laser scanning and drone-based aerial imaging to capture complex statue details and spatial relationships, which are then optimized for real-time rendering in a virtual environment. The resulting interactive simulation allows users to navigate the park remotely via web-based or desktop platforms, offering an immersive experience that preserves cultural heritage while overcoming geographical and physical access barriers. Evaluation through user testing demonstrates effective navigation, visual realism, and educational value. This work provides a scalable framework for digitizing open-air heritage sites, enhancing cultural preservation and accessibility through affordable virtual tour solutions.

Keywords: 3D simulation, Virtual tourism, Buddha Park, Cultural heritage