

Design and implementation of mixed reality narrative map of Nanjing Ming Dynasty City Wall based on video integration

Fei Yang^{a,b,c}, Haoyu Yang^{a,b,c}, Xiaoyan Liu^{a,b,c}, Shuai Hong^{a,b,c}, Jie Shen^{a,b,c,*}, JiJun Yang^{a,b,c}, Long Tang^{a,b,c}, Zhaowei Tian^{a,b,c}, Tengfei Chai^{a,b,c}

^a Key Laboratory of Virtual Geographic Environment (Nanjing Normal University), Ministry of Education, Nanjing 210023, China; 221301031@njnu.edu.cn (F.Y.), 10190522@njnu.edu.cn (H.Y.), liuxiaoyan@njnu.edu.cn (X.L.), hongsh_yc@njnu.edu.cn (S.H.), shenjie@njnu.edu.cn (J.S.), 1012773508@qq.com (J.Y.), 522480520@qq.com (L.T.), 1312546280@qq.com (Z.T.), 1798661793@qq.com (T.C.)

^b Jiangsu Center for Collaborative Innovation in Geographical Information Resource Development and Application, Nanjing 210023, China

^c School of Geography Science, Nanjing Normal University, Nanjing 210023, China

* Corresponding author

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Abstract:

As a relic of historical civilization, Nanjing Ming Dynasty City Wall has great historical and cultural value and is a precious architecture for studying the social development of China's Ming Dynasty and even the Republic of China. In recent years, how to preserve, inherit and disseminate the cultural heritage represented by Nanjing Ming City Wall through modern scientific and technological means has become so urgent. However, the current research lacks an in-depth excavation of the historical and cultural characteristics of the wall, and cannot dynamically show users the style and appearance of the wall in different historical periods.

Based on the theoretical knowledge of cartography, computer science and art, this work collects and organizes multi-source data, and uses multiple methods to construct scenarios and elements for video integration. The specific steps are as follows: 1) According to the cultural data, historical data, Nanjing ancient map data and remote sensing data, etc., we built a historical database and geographic landscape database by analysing the spatial-temporal characteristics of Nanjing Ming City Wall; 2) We designed hand-rolled map, AR scene, VR scene and folk custom converged media map by using methods of literary analysis, map element analysis, scenario design and scenario construction and made them integrated into an interaction system; 3) We wrote narrative lines for the video story of Nanjing Ming Dynasty City Wall, designed the story structure based on the above materials and map products, and adjusted the logical relationship between the shots; 4) Based on the context of the narrative map, we integrated the videos and adjusted the length of the shot, and we processed the audio in combination with the video rhythm.

To summarize, this paper showcases the integration of hand-rolled maps, AR scenes, VR scenes, audio, video materials, and other content into the video of the Nanjing Ming Dynasty City Wall. This approach not only diversifies the expression methods and interaction ways of the narrative map but also provides a reference for the expansion and dissemination of map products. The mixed reality narrative map design method presented in this article has a certain level of universality and can be applied to the design of other types of narrative maps.

While this research on creating story plots related to the Ming City Wall considers important historical stories and the geographical environment, it has some limitations. The presentation elements of the Ming City Wall also include urban construction and ecological environment impacts, which require an evaluation system to assess the effect of video narrative maps. Furthermore, the challenge of balancing cognitive efficiency and information density in the narrative map warrants further research.

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