

Flying Spirit in Dunhuang: Immersive Experience on Virtual Touring of Mogao Caves

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Dunhuang Caves are famous and important treasures of Chinese Buddhist art and culture dated back to more than 1,700 years ago. Since the twentieth century, academics from the East and West have done extensive research on Dunhuang Caves and accumulated vast amount of historical, cultural and artistic data. Today, digital technology has made it possible that an entirely new way to experience these ancient relics. In 2011, sponsored by Chiang Ching-Kuo Foundation for International Scholarly Exchange, we initiated a research project on applying digital technology to virtually experiencing Dunhuang caves. This project was jointly carried out by National Taiwan University and Academia Sinica, in collaboration with Dunhuang Academy China.

For the first stage of this project, from 2011 to 2013, we focused on developing the i-m-Cave system, an interactive multimedia system for virtually touring the Mogao Caves. To demonstrate the usability of this system, we have produced some digital contents for Cave 61, including animations for telling the stories in murals, and some digital restorations of 2D murals and 3D statues. We then designed several user interfaces that allowed the users to explore the cave based on the digital contents. For the second stage, from 2014 to 2016, our focus was shifted to the use of mobile devices, including mobile phones, tablets, and head-mounted displays (HMDs). Latest commercial products of HMDs, such as Oculus Rift or HTC Vive, have been able to deliver compelling immersive experience for virtual touring. The challenge is how to let the user explore, in an intuitive way, a large virtual space while staying within a limited physical space. We have investigated a few possibilities, and have designed an innovative jump-and-glide gesture to enable the user to explore the cave like a flying spirit. Some of our experimental results will be shared in this speech.