

Geo-info and Cultural Heritage

Architectural heritage is threatened by many manmade and natural influences, including war, population pressure, poorly managed tourism, neglect or inappropriate use of sites, air pollution and climate change. While the relevance of our cultural heritage and the need to protect and preserve it appears to be widely accepted, the need for metrically correct documentation of heritage sites seems to be less well recognised. Nevertheless, with the decades spatial documentation of sites has evolved from the status of hobby for the historically fascinated surveyor to that of mainstream geomatics. Spatial aspects of cultural heritage have now been accepted into the domain of geo-information.

Recent media reports of the destruction of international heritage sites have raised awareness and further underlined the efforts of those who support the "geomatics"™ approach to documentation: metrically accurate and objective documentation of what is physically present. This differs from virtual reconstruction in the form of CAD models based on rough measurements and generalisation. Spatial documentation of heritage has not only increased in volume and recognition, it has also developed from maps and CAD drawings into integrated databases combining spatial with contextual information, a process which brings together the geomatician, the anthropologist, the historian and the archaeologist.

Recent years have seen terrestrial laser scanners playing an increasingly prominent role in the spatial documentation of sites, and this technology is undoubtedly making an invaluable contribution, especially when used in conjunction with close-range photogrammetry. Notwithstanding its capabilities, some technical shortcomings of laser scanning should be noted. The processing time for laser-scan data can be up to ten times that of time needed for acquisition; the creation of surface models free of scan holes and with correct edges is difficult, and software for photographic texturing of the scanned surface has not yet been perfected. However, among the most crucial issues, at least in my opinion, is firstly the lack of pragmatic, affordable software to enable the archaeologist, conservator or architect to make practical use of the so generated 3D-models. Secondly, there is the danger similar to that associated with other highly automated instruments such as GPS, total stations, GIS or digital photogrammetry stations: namely the temptation for the layperson to produce aesthetically appealing 3D-computer models without considering reliability or accuracy. Laser scanning of heritage sites may still be at an early stage of development, but it is clearly here to stay.

One example of an integrated heritage database is the "African Cultural Heritage and Landscape Database"™ initiated by the present writer. The Andrew W. Mellon Foundation is funding this project and a website created by Aluka in New York will be online by early 2007. The database combines spatial and contextual data and is conceptualised around the principle of objective, metrically correct spatial documentation. Spatial data comprise a GIS for each site, computer 3D-models of structures and landscapes, stereo pairs, videos, panoramas, a variety of diagrams and plans, and photographs of the site within the context of its environment.

<https://www.gim-international.com/content/article/geo-info-and-cultural-heritage>
