Volume XL-5

Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XL-5, 23-28, 2014
www.int-arch-photogramm-remote-sens-spatial-inf-sci.net/XL-5/23/2014/
doi:10.5194/isprsarchives-XL-5-23-2014

Application of SFM and laser scanning technology to the description of mosaics piece by piece

O. Ajioka[1,2] and Y. Hori[1]

[1]Dep. of Architecture and Urban Design, Faculty of Human-Environment Studies, Kyushu University, 6-10-1, Hakozaki, Higashi-ku, Fukuoka-shi, Fukuoka, Japan

[2]Keisoku Research Consultant CO., 2-10-7, Yanaka, Adachi-ku, Tokyo, Japan

Keywords: SFM (Structure from Motion), laser scanning, comparison, mosaic, Ostia

Abstract. Mosaic floors of surviving buildings in Ostia have been mainly recorded in photographs. From 2008, Japanese research group carries out a project of 3d measuring of the whole structure of ancient Roman city Ostia using laser scanners, including its landscape, city blocks, streets, buildings, wall paintings and mosaics. The laser scanner allows for a more detailed analysis and a greater potential for recording mosaics. We can record the data of mosaics, which are described piece by piece. However it is hard to acquire enough high dense point cloud and the internal camera of the laser scanner produce low quality images. We introduce a possible technology of 3D recording of mosaics with high-quality colour information; SFM. The use of this technique permits us to create 3D models from images provided from a CCD camera without heavy and large laser scanners. We applied SFM system to different three types of the mosaics laid down on the floors of "the House of the Dioscuroi", "the Insula of the Muse" and "the House of Jove and Ganymede", and created high resolution orthographic images. Then we examined to compare these orthographic images with that are created from the point cloud data. As a result, we confirmed that SFM system has sufficient practical utility for the mosaic research. And we present how much of density of point cloud or ground resolution are required for the documentation of mosaics accurately.