Abstract:

This paper proposes a novel occlusion detection method for urban true orthophoto generation. In this new method, occlusion detection is performed using a ghost image; this method is therefore considerably different from the traditional Z-buffer method, in which occlusion detection is performed during the generation of a true orthophoto (to avoid ghost image occurrence). In the proposed method, a model is first established that describes the relationship between each ghost image and the boundary of the corresponding building occlusion, and then an algorithm is applied to identify the occluded areas in the ghost images using the building displacements. This theory has not previously been applied in true orthophoto generation. The experimental results demonstrate that the method proposed in this paper is capable of effectively avoiding pseudo-occlusion detection, with a success rate of 99.2%, and offers improved occlusion detection accuracy compared with the traditional Z-buffer detection method. The advantage of this method is that it avoids the shortcoming of performing occlusion detection and true orthophoto generation simultaneously, which results in false visibility and false occlusions; instead, the proposed method detects occlusions from ghost images and therefore provides simple and effective true orthophoto generation.