3D Panoramic mosaiciking in 3D image mosaicking for far-range urban area visualization

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Abstract

3D image mosaicking presents the roadside scene captured by a side-looking video camera as a continuous set of textured planar faces, which are termed “3D multiple planes” in the 3D image mosaicking. When one is filming a sequence of images from a side-looking video camera passing far-range areas and if the technique is applied to the sequence directly, the same urban objects appear in an image mosaic continuously and it is called as “ghost effect”. To reduce the ghost effect, this paper uses 3D panoramic mosaicking to the sequence including infinite range areas adaptively. The infinite range areas are detected by using the distance between the image frame and the 3D coordinate of tracked optical flows. The 3D panoramic mosaicking is to project the part of image frames onto 3D multiple planes by using vectors passing the focal point of frames and a virtual focal point. The virtual focal point is calculated by using two frames which are the first and last frames appeared infinite range areas. Here, we demonstrate an algorithm that creates efficient panoramic mosaics in 3D space from a sequence of real image frames including infinite ranges. Because the independent plane of each image frame is light 3D data, results created by the proposed method are likely to be MPEG-4 data. This data can be applied to 3D virtual city visualization on websites, cell phones, and PDAs.