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Reconstruction Method for Landscape Image

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Abstract. Creating video contents and game need many resources. These contents are constructed significant object and background. Background is usually landscape and needs many resources to create. Landscape image is perspective projection of three dimensional spatial. This means that one image includes spatial information. This paper proposed new 2.5 dimensional modeling for landscape image. The reconstructed 2.5 dimensional image demonstrated good result.

Keywords: landscape image, movement parallax, 2.5 dimensional model, tour into the picture

1 Introduction

Some contents such as animation and game are constructed significant object and background. Background is usually landscape which is combination of long-distance view, intermediate view and near view. If three dimensional computer graphics model is created for background, then it requires many resources. Meanwhile, two dimensional landscape image is perspective projection of three dimensional space. This means that one image includes spatial information. In other words, composition of two dimensional landscape image represents three dimensional coordinate values. So in case of 2.5 dimensional world scheme, three dimensional coordinate values are mapped to regions of two dimensional landscape image.

TIP (Tour into the picture) realizes walking through in two dimensional images. The scheme of TIP is that image is reconfigured in accordance with three dimensional information [1]. And TIP was improved in order to enhance visual quality [2]. Also depth calculating, including, viewpoint detection were archived from single image [3]. TIP was extended to a panoramic image [4]. The TIP method regions of landscape image are transformed geometrically when viewpoint is changed. This means that the TIP method is bit calculation volume and requires many computing resources.

We have proposed our 2.5 dimensional scheme of stage setting model. In this model, two dimensional single image is divided into some parts, which are roads, buildings and long-distance view, and relocating these parts in according to three dimensional information [5]. This method is simple scheme and light calculation load, when viewpoint is changed. However this scheme is only good for special composition, in which one center road and buildings along the road.

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In this paper, we proposed new 2.5 dimensional modeling for landscape. This is simple scheme and easy to create 2.5 dimensional modeling. And proposed scheme is not only one point perspective projection but also two point perspective projection.

The remainder of the paper is organized follows. Section 2 briefly describes 2.5 dimensional landscape model and demonstration of reconstructed landscape model. In Section 3, we present some resulting reconstructed 2.5 dimensional image. And Section 4 provided conclusion.

2 2.5 Dimension Landscape Model

Static image of landscape is constructed with background, middle ground and near view. Background can be treated as static image region. Almost middle ground can be treated as static image region with movement parallax. Near view include movement parallax and binocular parallax. Therefore it is necessary to realize movement parallax for reality of middle ground.

Figure 1 shows the relationship between landscape image and depth along horizontal of image. This landscape image is consisted with one straight street and some building along street. This means that the parts of image, which are buildings and street, can be mapped to depth information.

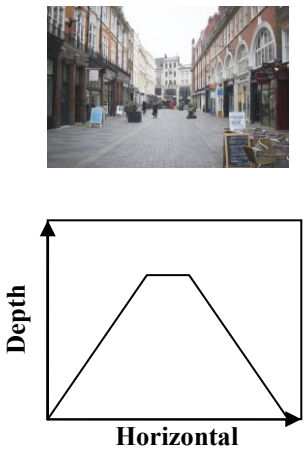


Fig. 1. Relationship between landscape image and depth location on image. Upper image is landscape which is consisted with a street and building and background. Bottom image shows depth location on the image.

Figure 2 show a process of making the 2.5 dimensional landscape modeling by proposed method. Figure 2(a) is an input image of landscape which is one-point perspective projection. Figure 2(b) shows that the image divided into many sliced images and (c) is the reconstructed the proposed 2.5 dimensional modeling scheme. All sliced images are arranged in form of shape of the building. The 2.5 dimensional

modeling data brings into movement parallax. The procedure of reconstruction method is shown below.

1) Input a landscape image.
2) Dividing the image into some belt-like regions.
3) Reconstructing the sliced belt-like region.

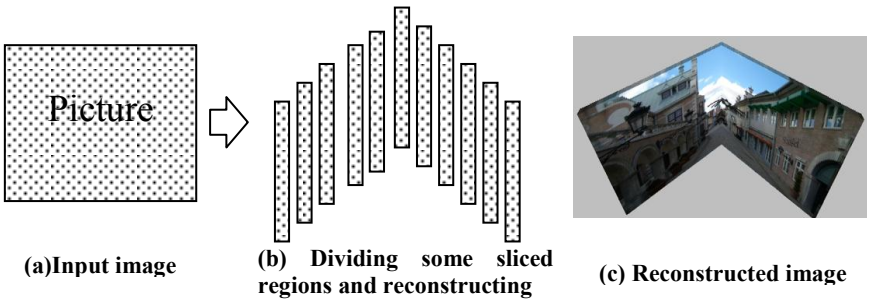


Fig. 2. Process of making the 2.5 dimensional landscape modeling by proposed method. (a) shows input image which is one-point perspective projection. (b) shows dividing input image into some sliced region and reconstructing the regions. (c) shows example of reconstructed image.

3 Results

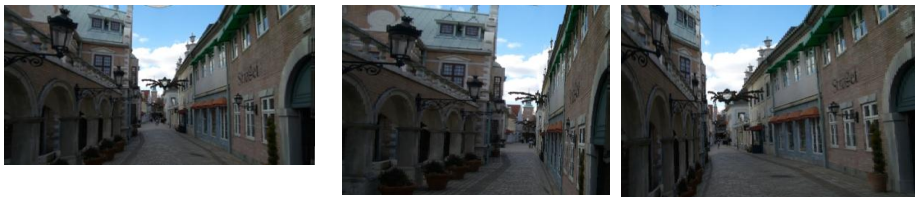
In this section we describe a reconstructed 2.5 dimensional landscape by proposed method.

Figure 3 shows that an input image and changed point of view image by proposed method. Figure 3 (a) shows input image. Figure3 (b) and (c) demonstrates motion parallax by proposed reconstructed method. Comparison with input image and changed point of view images, location of building are changed. In comparison between Fig.3(a) and Fig.3(b), it is obvious that viewing point was changed and movement parallax was realized. Similarly Fig.3(c) shows that movement parallax is realized. Also this 2.5 dimension image is light calculation load, because geometric transformation of regions of image is unnecessary.

4 Conclusion

Our proposed reconstruction method of static landscape image was realized movement parallax of middle ground. The reconstructed image by proposed method demonstrated good result.

In future work, we will apply other two dimensional image of two points perspective projection. And proposed method will be evaluated the many type of composition pictures.



(a)Input image **(b) Changed point of view by reconstructed image** **(c) Another changed point of view by reconstructed image**

Fig. 3. Changed point of view landscape image. (a) shows input image. (b) and (c) demonstrates motion parallax by proposed reconstructed method.

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