

Parallax Elimination by Inpainting

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Introduction

Nowadays the use of our hand as a way to interact with virtual environments is becoming increasingly popular. Using our own bodily function to control and interact with virtual objects is much easier and satisfactory than a mouse pointer or other similar device. Still, even though considered more accurate and user-friendly, the use of our hand has its setbacks, with the **Retinal Disparity** [1] being one of the most prominent problems.



Figure 1. Retinal Disparity: In this image, we can see the effects of retinal disparity that happens when we focus on the object, image (a), and when the focus is in our finger, image (b).

Most of the already existing applications with 3D environments uses 2D cursors to interact with the objects so they do not have to deal with this problem [2]. However, the use of 2D cursors generate various implications, namely speed, accuracy and usability, some may even cause discomfort for the user [3].

Proposed Method

We propose a method that will enable the use of our hand as a cursor without the setback of the Retinal Disparity.

The inpainting algorithm has been used to achieve the desired effect; different implementations of this algorithm have been tested in order to find the most suitable one.

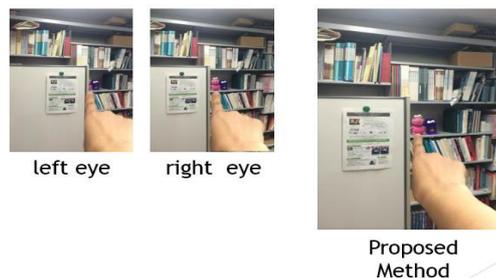


Figure 2. In here, we have the image capture from both our eyes, the left and right eye.

The general idea is to capture two images using a stereo camera, each image corresponding to one of each of our eyes, generating two slight distinct matrixes.

The two images will then compound one single matrix with information from both our eyes; the inpainting technique is applied to correct any flaw in the image that may appear from the composition. With this method, there should be no problem in regards of the Retinal Disparity.

The majority of the challenges are present in the inpainting algorithm itself, most of the already existing ones does not have a good precision correcting the flaws in the images or are too slow to be used in practice.

References

- [1] Bruder, Gerd; Steinicke, Frank & Sturzlinger, Wolfgang, 2013, 3D User Interfaces (3DUI), page 115-118.
- [2] Steinicke, Frank; Ropinski, Timo; Bruder, Gerd & Hinrichs, Klaus, 2007, Proceedings of the Virtual Reality Conference (VR2007), page 27-34.
- [3] Leila Schemali, Elmar Eisemann, 2014, Symposium on 3D User Interfaces, 3DUI 2014 (TechNote), page 67-70.