

Constructing Action Scenes for Mixed Reality Previsualization

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Abstract

This paper describes the constructing method of consistent action scene data of CG characters. The proposed method realizes to construct multiple characters' action scenes by merging one actor's action sequences with keeping time and space consistencies between multiple individually recorded or manually-designed action sequences semi-automatically. This technique is planned as a part of "Mixed Reality Pre-visualizing As Pre-Production Tool in Film-making; MR-PreViz" which can streamline the filmmaking process by overlaying CG action data on the real background image in real time.

1 Introduction

In recent epic filmmaking, CG-based Pre-Visualization(PreViz) is used for interpreting the director's intention by the shooting crew smoothly in addition to storyboards. We propose MR-PreViz[Tenmoku et al. 2006], the richly expressive PreViz tool using Mixed Reality (MR) techniques which can merge the virtual world into the real world in real time. MR-PreViz enables us to overlay CG-based actors' performances on the real background image at the actual location site. MR-PreViz can be an effective pre-visualizing method for scenes including fast action or complicated camera work.

To exert the capacity of MR-PreViz, it is necessary to support constructing CG action data which are merged with real background images. In MR-PreViz, we assume the following three construction methods of multiple characters' action scenes (Figure 1).

- Recording whole action of multiple characters at the same time
- Constructing action scenes by combining individually recorded or manually created one character's action sequences
- Creating one character's action sequences by splicing action building blocks

Here, (c) is realized by using existing techniques. On the other hand, to construct correct action scenes in (b), we have to adjust time and space consistencies between individually recorded or manually created action data. This paper describes a semi-automatic adjustment method of these consistencies.

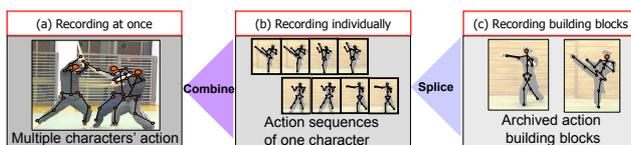


Figure 1: Construction method of action scenes.

2 Achieving Time and Space Consistencies

To adjust action timing of individually recorded or manually designed action data, the key frames (KFs) and the timing controllable frames (TCFs) are used. KFs are defined as the moments at which action of CG characters are intersected. TCFs mean the frames don't give uncomfortable feeling when the playback speed is changed (i.e., the frames in which the character is standing still). The proposed method changes playback speed at TCFs to accord KFs between characters sequentially (Figure2).

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To adjust relative position of action data, the proposed method uses the contact points (CPs) and position controllable frames (PCFs). We defined CPs as the points in which character's actions are intersected at every KF. PCFs are frames which don't give uncomfortable feeling when the character moves parallel in a horizontal plane (i.e., the frames in which the character is jumping or running). In the proposed method, the space consistency of action data is achieved by translating character's position parallel only in PCFs so as to accord CPs between multiple characters (Figure3).

In this method, we have to establish KFs, TCFs, CPs, and PCFs beforehand. Among them, TCFs and PCFs can be detected based on the content automatically. In the case of designed action sequences from action building blocks, all of them can be established beforehand. In each case, KFs and CPs have been inputted by the user.

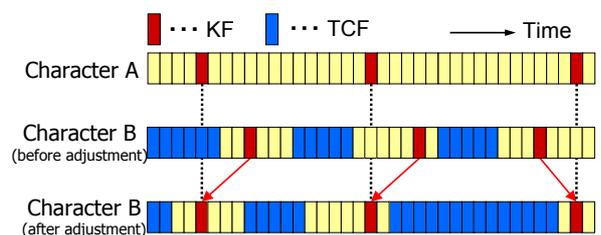


Figure 2: Adjusting time consistency.

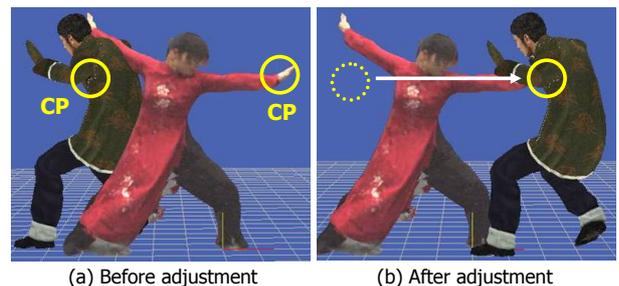


Figure 3: Adjusting space consistency.

3 Summary

This paper describe a constructing method of action scenes which keep time and space consistencies semi-automatically. The idea of this method is occurred in the MR-PreViz project. However, we regard that this method can be useful for other applications.

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