A choreographic authoring system for character dance animation reflecting a user's preference

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Abstract

We propose a new system for constructing character dance animation by considering animator's preferences. First, a user of the proposed system assigns a preferred motion obtained through a searching algorithm to arbitrary part in the music. Then the proposed system automatically assigns motions to the other remaining parts of the music by using motions in a database. We can create a new dance performance for character animation considering a user's preference by this system.

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1. Introduction

Numerous movies containing 3D character dance animation are created by professional or amateur animators by using 3DCG animation editing tools. However, it is still awkward for novice animators to create such dance animation since it requires a lot of work, knowledge in dancing, and skills for constructing CG animations. We presents a choreographic authoring system for character dance animation reflecting animator's preferences with less burden. First, a user assigns a preferred motion to arbitrary part in the input music. Then the proposed system automatically assigns motions to the other remaining parts of the music. Therefor, the user can focus on the parts that he/she has a strong preference for in the music. In this first step, the motion retrieval technique enables the animators to choose their preferred alternative motion from the database. However, existing motion retrieval methods often place a large burden on animators, since they need to input motion as a query by figure drawing, or using motion capture devices. To overcome these problems, we implement an intuitive system for choosing their preferred alternative motion data only a few mouse clicks.

2. A Choreographic Authoring System

First, the user assigns a preferred motion to any part in the music. In parts where a motion is not assigned, the system synthesizes automatically so that dance motions are connected naturally as the initial step. Secondly, the user selects parts he/she want to fix or change in a sequence of dance. The user replaces the part he/she want to change for other preferred motion from motion database. Dance motions that correspond to untouched parts in the music are updated automatically again. Finally, a new sequence of dance considering the user's preference is composed by repeating the steps.
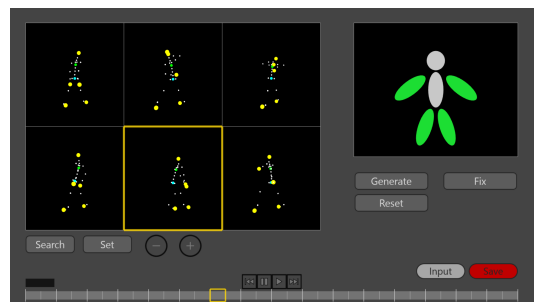

Figure 1: *Example of interactive sequence selection*

We focus on two issues: (1) how can we enable a user to easily search for his/her preferred motion? and (2) how can we automatically synthesize a sequence of dance? We solve (1) by visually presenting the user with some sequences that they can choose from (Fig. 1), or by using relevance feedback based on the diversification framework proposed by [DHC*11]. It is difficult to judge whether a dance motion is good or not without previewing a dance in conjunction with a corresponding musical piece for most users. In our system, the user can see sequence candidates on a screen. Then, we solve (2) by fixing the user's clips and filling the additional space with clips from the database. The filling clips are selected by minimizing an evaluation function C using Dijkstra's algorithm. C consider both the posture similarity S_{pose} and movement similarity S_{move} of motion segments ($C = 1/(S_{pose} + S_{move})$).

References

[DHC*11] Dou Z., Hu S., Chen K., Song R., Wen J.-R.: Multidimensional search result diversification. In *Proc. of WSDM* (2011), ACM, pp. 475–484. 1