

AVICE: Evolving Avatar's Movernent

Hiromi Wakaki and Hitoshi Iba

Graduate School of Frontier Science

The University of Tokyo

7-3-1 Hongo, Bunkyo-ku, Tokyo, 113-8656, Japan

{wakaki,iba}@miv.t.u-tokyo.ac.jp

<http://www.miv.t.u-tokyo.ac.jp/~wakaki/HomePage.html>

Abstract. In recent years, the widespread penetration of the Internet has led to the use of diverse expressions over the Web. Among them, many appear to have strong video elements. However, few expressions are based on human beings, with whom we are most familiar. This is deemed to be attributable to the fact that it is not easy to generate human movements. This is attributable to the fact that the creation of movements by hand requires intuition and technology.

With this in mind, this study proposes a system that supports the creation of 3D avatars' movements based on interactive evolutionary computation, as a system that facilitates creativity and enables ordinary Users with no special skills to generate dynamic animations easily, and as a method of movement description.

1 Introduction

The creation of 3D-CG animations requires a tool that can easily and accurately change the details of the movement rather than joining the parts of the movement. inverse kinematics (IK) is good at balancing the movements of joints relative to other joints, but a great deal of knowledge, experience and intuition is required to describe a movement.

In consideration of the above, we realized a System called AVICE that generates movements through Interactive Evolutionary Computation (IEC) [3,2,1]. AVICE Supports the user creativity in designing motions, which is empirically shown.

2 Outline of AVICE System

AVICE system uses H-Anim to express avatar. The Humanoid Animation Working Group (<http://h-anim.org/>) specifies how to express standard human bodies in VRML97, which is called Humanoid Animation (hereinafter referred to as "H-Anim").

AVICE system integrates Creator, Mixer and Remaker modules (See Fig. 1). Each relationship is that Mixer module take in the Output of Creator module and other Softwares. Creator module makes VRML files suited user's taste from initialization used IEC [4]. Mixer module makes VRML files suited user's taste from inputted files used IEC.

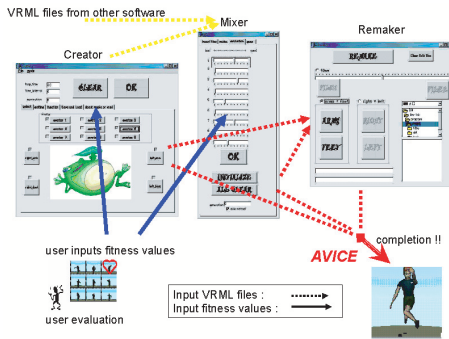


Fig. 1. outline of AVICE system

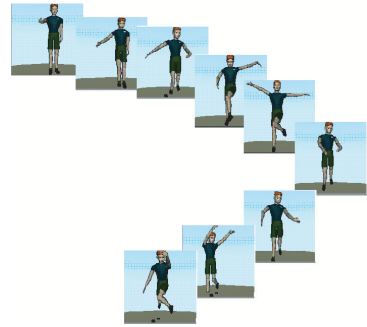


Fig. 2. Example of created movements

3 Demonstration of Created Movements

Movements shown in the Fig. 2 were acquired as a result of the experiment of AVICE System. In this movement demo, avatars are dancing to two types of music. The movements were created by joining movements deemed to suitable to the music. Even if no music data has been imported, it shows that they are in rhythm. The difference between the two also shows that their dance is not only in rhythm to the music but also suits the atmosphere thereof.

4 Conclusion

Few expressions are based on human beings, with whom we are most familiar. This is deemed to be attributable to the fact that it is not easy to generate human movements. If movements of avatars can be created based on VRML, which can be displayed by a browser, it should increase the ways in which individuals express themselves, as they do through paintings and music.

References

1. P.J. Bentley. *Evolutionary Design by Computers*. Morgan Kaufmann Publishers Inc., 1999.
2. H. Takagi. Interactive evolutionary computation – cooperation of computational intelligence and human kansei. In *Proceeding of 5th International Conference on Soft Computing and Information/Intelligent Systems*, pp. 41–50, Oct. 1998.
3. T. Unemi. Sbirt2.4:breeding 2d cg images and movies, and creating a type of Collage. In *Proceedings of The Third International Conference on Knowledge-based Intelligent Information Engineering Systems*, pp. 288–291, Adelaide, Australia, Aug. 1999.
4. H. Wakaki and H. Iba. Motion design of a 3d-cg avatar using interactive evolutionary computation. In *2002 IEEE International Conference on Systems, Man and Cybernetics (SMC02)*. IEEE Press, 2002.