

Digitizing EU Folk Dances

Abstract

This project aims to create a publicly accessible digital archive of Cypriot and European folk dances using 3D motion capture data (with metadata); currently, only 2D video recordings are used to document traditional dance performances, having although restrictions (mainly due to the character occlusions) by the limited capabilities of the 2D cameras. In addition to rare video material held by local cultural institutions, state-of-the-art motion capture technologies are utilized to record and archive high quality motion data of expert dancers. The main goal of the project is to preserve the intangible cultural heritage by digitizing it. In addition, we hope to increase the local community awareness of its dance heritage by implementing a 3D video game that will be used for teaching these folk dances to the younger generations.

Introduction

Europe has a rich history and diverse tangible and intangible cultural heritage, which in recent years has been hardly recorded, curated and remediated. Similar to literary and visual arts, performing arts and especially folk dancing is an important part of the local cultural heritage. However, being intangible cultural heritage, folk dancing cannot be easily preserved and its dissemination to the younger generations has become challenging for the few cultural institutions offering lessons. Currently, the vehicles for preserving and disseminating folk dancing are primarily the dance teachers and some of the senior citizens, as well as rare video recordings from local festivals, weddings and other social gatherings. This project aims to digitize, record and archive some of the EU folk dance heritage and disseminate it to the wider local community and serve as a reference for related research activities. In addition, we expect to increase the local population's awareness of its folk dance heritage by introducing a novel dance teaching system that anyone can use at home and thus enhance the chances of these dances' sustainability in time.

Digital Preservation of EU Folk Dances

The project intentions are to establish a digital online library, where the wide public will be able to download different formats of the dances including the original videos, motion capture data, the visual actors and metadata information for each dance and performer. These data will be available for further studies, for motion or dance reproduction and elaboration. A motion capture system will be used for capturing the performer's skeleton. Having the positions of the character skeleton over time is equivalent of capturing its 3D motion in space. In order to give a more realistic form to our virtual character, the reconstructed skeleton has been incorporated to a digital grid (mesh) that describes the shape of the virtual character (see fig.3).



Fig. 1. The dance performers wearing the mocap suit at the VRL laboratory.

We have already captured different solo male and female dances: first, second and third antikristos (πρώτος, δεύτερος και τρίτος αντικριστός), Cypriot and Greek zeimpekiko (κυπριακό και ελληνικό ζεϊμπέκικο), hasariko (χασάπικο), Cretan Maleviziotiko and Haniotiko (Κρητικό Μαλεβιζιώτικο και Χανιώτικο), Spanish Flamenco (Φλαμένκο). Fig. 1 shows different dance performers wearing the mocap suit and performing folk dances at the VR Lab of our department.

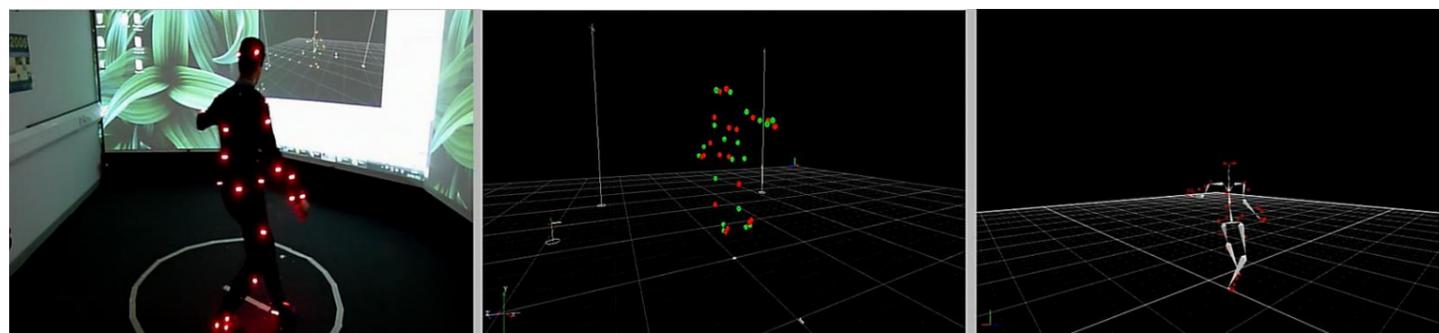


Fig. 2. (a) the performer dancing a solo dance, (b) the marker positions as seen by the motion capture system (view from the opposite site), and (c) the skeleton reconstruction (motion) of the character as captured by the mocap system.

Fig. 2 shows an example of the digitization process, where motions are captured and finally transformed to a 3D avatar.

Teaching dances using a video game

Folk dances have been preserved by the teachings of expert dancers to novices, in a teacher-to-student relationship or by choreography notation systems, such as Labanotation. A relatively new trend in dance teaching is the use of 3D virtual environments, such as games, enriched with avatars that train users in dancing. (e.g. Dance Central Xbox360 game by Harmonix Music). In a similar way, we are using the Microsoft Kinect system to demonstrate the dances, capture the trainee's movements and compare them with our dance library (see fig. 3).

Future Work

We are planning to use algorithms that convert Computer Animation into Labanotation system and store this data into the database. A longer term goal is to use this method of digital preservation of folk dances for dance heritage in many other countries. The ability to compare motions algorithmically could improve our understanding of the origin of dance moves and exchanges of cultural characteristics between ethnicities.

Acknowledgements

This project (DIDAKTOR/0311/73) is co-financed by the European Regional Development Fund and the Republic of Cyprus through the Research Promotion Foundation.



Fig. 3. Left: a virtual dancer wearing the traditional Cypriot costume that is controlled by the body movements of the player. Right: the virtual teacher is demonstrating the dance the user should perform.