

A new dimension of dance

Wholodance is using technology from blockbuster films to bring a new perspective to dance teaching, choreography and preserving cultural heritage.

The scene is a studio in Amsterdam. Cameras on tripods line all four edges of a dance floor. A long table is full of computer equipment and screens.

In the centre of the room a flamenco dancer's feisty flicks of her hands and passionate percussive movements of her feet capture the attention of everyone present.

But instead of the traditional frilled and flowing dress, this dancer is wearing a tight black outfit and cap over her hair. Dozens of small grey balls are attached to her outfit, her head and feet. Red lines have been drawn on her joints.

Welcome to the world of Wholodance.

It's a pioneering project fusing traditional dance genres with Hollywood-style motion capture technology.

This studio feels more like a film set from Lord of the Rings than the famous flamenco

venues of Corral de la Moreria or Puerto de Trina.

Those white balls, which are actually hi-tech sensors, and cameras are capturing the information of every movement of the dancer's body.

The data is translated to give a complete recreation of the dancer's movements in the form of a 'stick-person'-type avatar on screen.

And this representation contains far more useful information to help teachers, students and choreographers than an average video of their performance.

The project also allows this to be translated into virtual reality.

Dancers wearing the Hololens – a special pair of VR glasses developed as part of the project – can even perform with a holographic version of themselves.

"The only technology normally found in a



dance studio is for the music, or perhaps a video camera. This adds a completely different perspective," says Karen Wood, a research associate at Coventry University's Centre for Dance Research (C-DaRE).

"I think a lot of artists and performers have a curiosity about how they can use digital technology in their practice. We're excited about showing people how this can be used."

The technology gives dancers a whole new insight into how they move, as well as instant feedback from a performance.

Dr Wood adds: "For the flamenco, these sensors are capturing every movement of every part of the body even down to every flick of the finger. There's so much more detail about your joints, your skeleton, so much more accuracy – it's fantastic. It shows it in 3D and so gives a different dimension to watching a dancer perform on video.

"Dancing next to the hologram is a different experience again. It's dancing with a version of yourself."

The three-year Horizon 2020-funded project involves 10 project partners in Greece, Italy, Amsterdam, Spain, France and the UK.

Dancers and choreographers are working with computer scientists, programmers and motion capture experts to create a range of digital dance tools.

It focuses on four particular genres of dance – ballet, Greek folk, flamenco and contemporary.

And it's flamenco where CDaRE's expertise lies, with dancer and Senior Research Assistant Rosa Cisneros a key part of the project.

She's the one performing the dances while wearing the motion-capture suit.

"It was a really magical moment when I first looked at the screen and saw this avatar

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Using this technology really brings it into the modern world
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representation of me dancing," said Rosa.

"I noticed so many new things about how I dance and how I move my body."

"You can't have that experience watching a video of yourself. It's not the same.

"It's been really positive. I've been dancing my whole life and it's really changed my perceptions."

Rosa spent 15 hours, spread across two days, dancing in the suit to record dozens of flamenco moves and routines.

And she believes the project opens up a whole new world for flamenco dancers – and those performing in other genres.

"Flamenco dancers are trained in a very traditional, communal setting.

"It's very different to learning ballet. With flamenco it is about listening to the music, the rhythm, training the ear first and then training the body.

"Using this technology really brings it into the modern world.

"It gives a greater understanding and reflection about how we're dancing."

It's hoped that once the technology has been perfected it could be used by professional choreographers and dance companies.

Wearing the VR glasses to see the holographic version of themselves dancing, and perform alongside it, can help refine their technique.

The researchers say they've received great feedback on the project when they've showcased it at events in London, Madrid, Toulouse, Greece and The Netherlands.

And as part of the process of getting the technology to the stage where it can be used by elite dancers, the project has produced a huge repository of motion captured clips of dances.

Thousands of digital files have been recorded, from intricate flamenco routines, contemporary dance sequences, Greek Folk dance group dances to the most basic of ballet steps.

"We're capturing this amazing digital library of all these movements. It's preserving cultural heritage," added Dr Wood.

"There's such an interesting mix of dances that are part of this project, these genres haven't been digitally brought together in this way before.

"There are dances that have been passed from generation to generation and there is really no permanent digital record of what they are – until now"

"The potential for what we could do with this library is immense," she added.

The holograms, virtual reality and motion-capture technology may indicate this project is all about the future of dance, but it seems it also has a key role to play in preserving the past.

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