

# WHOLODANCE

## Whole-Body Interaction Learning for Dance Education

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## Deliverable 8.6

## Dissemination events (M19-M36)

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## Introduction

This document aims to report dissemination events attended/organised by the WhoLoDancE Consortium (or some of its partners) within the Second Reporting Period (M19-M36, i.e., July 2017-December 2018), also taking into account the confirmed events in the next months, still in preparation. The report is meant to complement the previously submitted D8.4 (*Dissemination events (M1-M18)*), reporting dissemination events of the First Reporting Period, as part of the agreed dissemination strategy (D8.1, *Dissemination and Exploitation strategy plan and preliminary materials*).

These events are ascribable to two chief categories:

- (1) *Scientific conferences* in relevant research fields, such as *movement and computing* (e.g., MOCO), *signal processing* (e.g., EUSIPCO) or *dance research* (e.g., *Digital Echoes*), where project results have been presented at the presence of selected members of the academic community, in the form of conference papers/talks, interactive workshops/seminars, or both;
- (2) *Dissemination events* organised for a broader, non-specialised public, accounting for both self-organised events at the intersection of dance and IT (e.g., *WhoLoDancE-Metabody Toulouse*, *WhoLoDancE Seminar Madrid*), and large renowned events, such as the *Romaeuropa Festival* or the *Genova Science Festival*.

Worthwhile mentioning, from the third year onward these events have basically taken the form of an interactive workshop, namely the *WhoLoDancE Performative Workshop (WPW)* (see *Appendix* for the relevant document describing it in full details) where the project tools have been jointly presented by our tech and dance experts by alternating technical demonstrations – with hands on spaces allowing the public to engage with the tools, i.e., for *Choreomorphy* and the *movement sketching tool* – and live dance performances – also involving the public in the case of flamenco and Greek dances -.

The Consortium has made significant efforts to promote events in advance through a variety of channels:

- the website, where they have been showcased in advance under the “Events” page and through temporal banners flowing on the home page; it is important to mention that, to optimise the dissemination potentialities of the website, this has been extensively revised, by the design of a new logo, a new relevant home page graphic layout and several other improvements such as the banner box (to showcase upcoming events and recent publications), a social media bar to directly connect with the other dissemination channels, and a general rearrangement to enhance its attractiveness and maximise dissemination efficiency; also, the website is currently participating to the 2018 edition of the .eu Web Awards, a competition awarding a prize to the best .eu websites in different categories, which is expected to boost further visits and, in the best case, could lead to the website being showcased at Brussels airport in a two month billboard advertising campaign;
- the social media channels, including Twitter, Facebook, Instagram and Pinterest, where events have been promoted before, during and after they took place with relevant photos and video clips;
- other external platforms, such as the Eventbrite and Evensi platform, or the websites of institutions and conferences hosting the events;
- local diffusion through media (TV, newspaper), dance companies, dance academies, universities and schools.

In both contexts, WhoLoDancE raised significant interest among a variety of attendees, including IT researchers, dance experts, dancers and choreographers, as well as lay people with diverse educational backgrounds.



Figure 1. Preview of the website home page after the re-styling, with flowing banner showcasing upcoming dissemination events.

## Dissemination events

YEAR 2 (July – December 2017)

### Demo Performance Solo #1

<b>Title</b>	Demo Performance Solo #1	<b>When</b>	6 December 2017		
<b>Where</b>	Genova, Italy	<b>Venue</b>	Casa Paganini InfoMus		
<b>Type of event</b>	Dance performance and public discussion with the performers	<b>Audience</b>	non-specialised		
<b>Brief description</b>	The event, organised and promoted by UniGe and <i>Fondazione Bogliasco</i> , consisted in a dance performance by K. Danse based on the research on interaction between dance, images, sound and technologies, elaborated during the residency of Jean-Marc Matos and Marianne Masson (K. Danse) at the foundation. The performance was followed by a public debate with the performers and an installation of students of UniGe focused on their research on movement qualities.				
<b>Self-organised</b>	Yes	<b>Leading organiser</b>	UniGe	<b>Participation</b>	UniGe, K. Danse
<b>Dissemination</b>	Press release, leaflet				



**Mercoledì 6 dicembre - ore 18.30 - Casa Paganini**  
Piazza Santa Maria in Passione, 34

## DEMO PERFORMANCE Solo#1

Jean-Marc Matos e Marianne Masson presentano presso Casa Paganini - InfoMus una demo performance elaborata durante la loro prima residenza presso la Fondazione Bogliasco. Si tratta dell'inizio di una ricerca dedicata all'interazione tra danza, immagine, suono e tecnologie. Segue dialogo con gli artisti.




*Co-creation 2018-2019 Jean-Marc Matos (K.Danse), Marianne Masson, Antoine Schmitt and InfoMus.*



**Dalle ore 18.00**  
Gli studenti in *Digital Humanities - Tecnologie delle emozioni* presentano al pubblico un'installazione interattiva volta alla sperimentazione delle qualità del movimento.

Giulia Perdomini, Marina Saglietti, Martina Sciaccaluga, Oxana Manokhina, Alberto Lasso

This research is supported by European Union's Horizon 2020 research and innovation programme under grant agreement No 688865 WHOLODANCE [www.wholodance.eu](http://www.wholodance.eu)



Figure 2. Leaflet of the Demo performance Solo#1 event.

## WhoLoDancE-Metabody Toulouse

<b>Title</b>	WhoLoDancE-Metabody Toulouse		<b>When</b>	18-19 December 2017	
<b>Where</b>	Toulouse, France			<b>Venue</b>	Centre Culturel Bellegarde
<b>Type of event</b>	Hands-on workshop, interactive dance performance			<b>Audience</b>	non-specialised
<b>Brief description</b>	The event was a path along different rooms, each one dedicated to a different tool, with the responsible technical partner (for presentation and demo) and, when feasible, a representative of a dance partner (for practical demonstration). When the person/group entered the room, the presentation/demonstration started, then allowing additional time for the person(s) to pose questions and experiment with the tool. On the second day, the event was correlated by a talk by Jaime del Val, coordinator of the Metabody project and, in the evening, a live dance interactive performance, namely "Radical Choreographic Object", by K. Danse.				
<b>Self-organised</b>	Yes	<b>Leading organiser</b>	K. Danse	<b>Participation</b>	Lynkeus, Athena RC, Polimi, UniGe, Covuni, Peachnote, K. Danse, Stocos, Lykeion ton Hellenidon
<b>Dissemination</b>	Website, event platforms (Eventbrite, Evensi), Twitter, Facebook, local diffusion (dance companies and schools)				

*Metabody Toulouse* is a collaborative platform for experimentation, critical thinking and presentation of artistic works, which proposes transdisciplinary exchanges between artists, scientists, programmers, inventors, researchers, philosophers. The platform, initiated in 2013 by the K. Danse Company in the frame of its artistic and technological research, is the local extension of the EU-funded Metabody project, investigating the homogenisation of expressions induced by current information and control technologies, and proposing to reinvent them through a new concept of interactive architecture constituting dynamic, participatory and performative environments for outdoors and indoors.



Figure 3. George Tsabounaris (Athena RC) helping a professional dancer from the public dressing on the mocap suit for playing with the Choreomorphy tool.

Then, the public was given the chance to try the devices on and play with them for any time they wanted to.

The second day, the event was enriched by a talk by Jaime del Val, coordinator of the Metabody project, and, in the evening, a live interactive dance performance by the K. Danse company, entitled "Radical Choreographic Object", an interactive participatory dance performance which unfolds according to the physical behaviour of the participating audience and their reactions instructed via their smartphones.

For the 2017 edition, *Metabody Toulouse 2017*, K. Danse conceived a mixed event between the two projects, where to explore the prototype tools developed within WhoLoDancE while getting to know the Metabody concept. To do so, the event was conceived as an articulated path along different rooms, each one dedicated to a specific tool, presented by a representative of the technical partner responsible for its development (with the only exception of the blending engine, which was presented by Polimi in place of Motek) and, for the multimodal tools (e.g., Choreomorphy, sonification), a representative of a dance partner giving a practical demonstration.



Figure 4. Public engaging with the sonification tool.



Figure 5. Massimiliano Zanoni (Polimi) giving a demonstration of the blending engine.



Figure 6. Amalia Markatzi (Lykeion ton Hellenidon) engaging the public in a performance of traditional Greek folk dances.

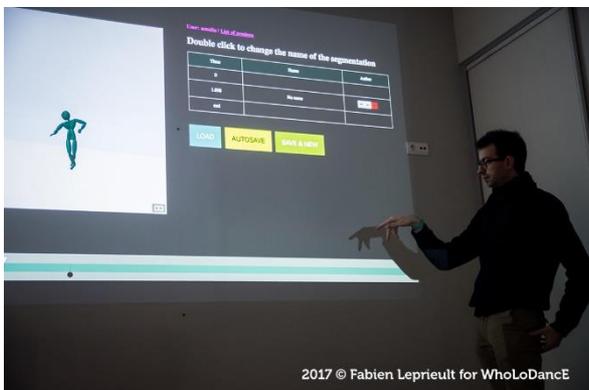


Figure 7. Michele Buccoli (Polimi) illustrating the segmentation tool.



Figure 8. Jaime del Val giving a talk regarding the Metabody approach.



Figure 9. Moments of the interactive dance performance by K. Danse, "Radical Choreographic Object".

### Minor dissemination events

A list of further, minor dissemination events is reported below (from D9.6, *Second Intermediate Report*).

Event type	Title	Date	Location	Partner and role	Audience
Conference	<i>Conferencias del Espacio de Creación e Investigación Sonora</i>	6 July 2017	<i>Universidad Autónoma de Madrid-UAM, Madrid, Spain</i>	Stocos, author, presenter	Scientific and artistic community
Conference	International Dance and Somatic Practices Conference	7-9 July 2017	Coventry, United Kingdom	Sarah Whatley, Rosamaria Cisneros, Ruth Gibson, Karen Wood, Covuni, speaker	International somatic practices and dance community, wider audience
Workshop	Calibre network meeting	17 July 2017	Loughborough University, London, United Kingdom	Covuni, speaker	Network team members
Conference	TaPRA conference	31 August 2017	University of Salford, Salford, United Kingdom	Covuni, speaker	International theatre research community
Conference	DataAche: Digital Research in the Humanities and Arts	11-12 September 2017	Plymouth University, Plymouth, United Kingdom	Covuni, speaker	International research and artist practitioner community
Workshop and live demo	Researcher's Night (workshop title: Whole-body interaction tools for dance learning)	22 September 2017	Lavrio, Greece	Athena RC, presenter	Dance community, wider audience
Workshop with presentation and booth	Researcher's Night (workshop title: Whole-body interaction tools for dance learning)	29 September 2017	Cultural Center "Hellenic Cosmos", Athens, Greece	Athena RC, presenter	Dance community, wider audience
Conference	MMSP2017	16-18 October 2017	Luton, United Kingdom	Polimi, Author and speaker	Scientific community
Evaluation workshop	MoCap drop in session	3 November 2017	London, United Kingdom	Covuni, facilitator	Invited participants
Workshop	WhoLoDancE	8 November 2017	Athens, Greece	Lykeion ton Hellenidon, presenter	Greek dance club members
Open day with presentation and booth	University Open Day	24 November, 2017	Athens, Greece	Athena RC, presenter	High-school students

Contest, with presentation and participation to the contest	INSPEAR 2017	10 December, 2017	Athens, Greece		
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Table 1. List of minor dissemination events held by the Consortium in the second year of the project (January – December 2017).

## YEAR 3 (Jan – July 2018)

## WhoLoDancE Seminar Madrid

<b>Title</b>	WhoLoDancE Seminar Madrid		<b>When</b>	17-18 April 2018	
<b>Where</b>	Madrid, Spain		<b>Venue</b>	Naves Matadero – Centro Internacional De Artes Vivas	
<b>Type of event</b>	Hands-on workshop, dance performance		<b>Audience</b>	Non-specialised	
<b>Brief description</b>	The event was the first held in the form of the WPW, in a unique big room where the audience stood in the centre and in the four corners technical and dance partners presented and demonstrated the different project tools. In the evening of the first day, the centre hosted a live dance performance by Stocos, entitled “The Marriage of Heaven and Hell”.				
<b>Self-organised</b>	Yes	<b>Leading organiser</b>	Stocos	<b>Participation</b>	All Consortium partners
<b>Dissemination</b>	Website, event platforms (Eventbrite, Evensi), Twitter, Facebook, local diffusion (TV, newspaper)				



Figure 10. Naves Matadero - Centro Cultural de Artes Vivas.

The two-day event was organised by Instituto Stocos at the International Living Arts Centre Naves Matadero, a former slaughterhouse now turned into a big cultural centre with library, study hall, spaces for temporal exhibitions as well as live shows, bar/restaurants and open-door spaces.

The seminar constituted the first test of the WPW, which was performed in a big room, with the public standing or sitting in the middle, one big screen projecting project-related clips and photos and the four corners set up with different project tools. Technical and dance partners alternated demonstrating the various tools, with – for

Choreomorphy and movement sketching – some time allowed for hands on public engagement, while dancers from K. Danse and Stocos showing the possibilities offered by the sonification tool in a dance improvisation performance. The workshop concluded with an interactive demonstration of traditional Greek folk dances by Lykeion ton Hellenidon. The centre organised the workshop into 2-h timeslots (i.e., the duration of the workshop), distributing the public in small groups of 15-20 people at each timeslot. The groups were composed of homogenous groups (e.g., university or high school classrooms) or heterogeneous groups of people with different backgrounds. In the evening, Instituto Stocos gave a live dance performance, entitled “The Marriage of Heaven and Hell”.



Figure 11. A university student and dance practitioner engaging with Choreomorphy.



Figure 12. The dance improvisation demonstration of the sonifications tool by K. Danse and Stocos.

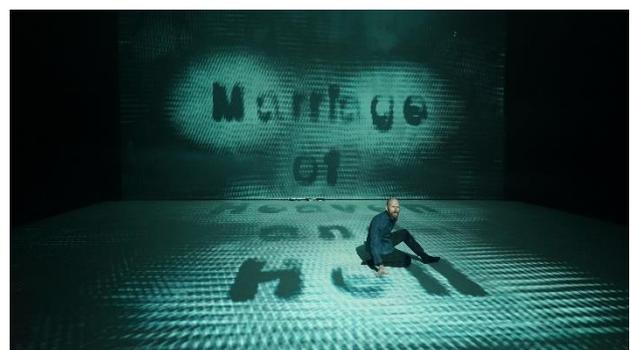


Figure 13. A moment of the dance performance “The Marriage of Heaven and Hell” by Stocos. Photo credits: Pablo Palacio.

### Digital Echoes Symposium 2018

<b>Title</b>	Digital Echoes Symposium 2018, "Reflections off the future"		<b>When</b>	23 April 2018	
<b>Where</b>	Coventry, United Kingdom		<b>Venue</b>	Centre for Dance Research, Coventry University	
<b>Type of event</b>	Conference		<b>Audience</b>	Academic	
<b>Brief description</b>	The event was a one-day symposium regarding current trends in dance and digital technology, focusing on intersections of interdisciplinary work of thinkers, artists, dancers, performers, academics and technologists. The symposium hosted talks by representatives of the Athena RC and Covuni team and gave the opportunity to showcase the tools, engage in fruitful discussions and get valuable insights to be shared with the other Consortium members.				
<b>Self-organised</b>	Yes	<b>Leading organiser</b>	Covuni	<b>Participation</b>	Covuni, Athena RC
<b>Dissemination</b>	Website, Twitter, Facebook				



Figure 14. DES16 Eline Kieft in Emilie Gallier's silent lecture. Credits: Koko Zin.

Digital Echoes is an annual symposium organised and hosted by the Centre for Dance Research of Coventry University which looks at the current trends within the dance and digital technology field. It examines closely the intersections of interdisciplinary work and brings leading thinkers, artists, dancers, performers, academics and technologists together.

As an acoustic phenomenon, an "echo" is a reflection of sound off a surface. The time it takes to reach this surface and return is proportional to the distance between the sound source and the surface. Digital Echoes began in 2011 engaging with reflections off the surfaces of the past, in the form of artistic responses to two digital dance archives.

For Digital Echoes 2018, organisers invited contributions that reflected off the surfaces of the future, by asking "Where are we going?", letting imaginations run free to dream up how this future echo might appear. This proposal was made in the wake of the publicity surrounding Yuval Noah Harari's "Homo Deus: A Brief History of Tomorrow" (2015) and inspired by the concept of Future Studies, an interdisciplinary controversial field. The focus was thus the study and analysis of patterns of the past and present to explore "sustainable futures". In 2018, the organising committee also went against the historical digital grain of the symposium and encouraged contributions from a broader range of perspectives whether they consider themselves to be analogue, beyond- or Post-digital.

The project was featured in the 2018 symposium in a number of ways: Katerina El Raheb (Athena RC) gave a talk while Coventry University members presented the whole project and its goals, highlighting the progress being made and inviting the DES2018 participants to examine the implemented tools and discuss the relevant progress. The COVUNI team spoke with several participants and engaged in meaningful and useful conversations, the content of which was taken back and shared within the Consortium in the appropriate contexts.



Figure 15. A moment of the Digital Echoes Symposium 2018.

## MOCO 2018

<b>Title</b>	5 <sup>th</sup> International Conference on Movement and Computing	<b>When</b>	28-30 June 2018		
<b>Where</b>	Genova, Italy		<b>Venue</b>	Casa Paganini InfoMus	
<b>Type of event</b>	Conference (with interactive workshop + conference papers/talks/performances)		<b>Audience</b>	Academic	
<b>Brief description</b>	MOCO is an international research conference focused on computing-based approaches to movement analysis. Within the conference, Consortium partners held various talks (with relevant conference papers) regarding specific tools/aspect of the project development, performances, and a workshop as a single session of the WPW was organised for the conference audience.				
<b>Self-organised</b>	No	<b>Leading organiser</b>	University of Genova	<b>Participation</b>	Lynkeus, Athena RC, Polimi, UniGe, Covuni, Peachnote, K. Danse, Stocos, Lykeion to Hellenidon
<b>Dissemination</b>	Website, Twitter, Facebook, conference papers (see list)				



MOCO is an interdisciplinary conference, co-organised by University of Genova, Paris 8 University, MINES ParisTech and IRCAM, that explores how computer science and technology can contribute to a deeper understanding of human movement practice, to support and facilitate movement expression and communication, and to design

and develop new paradigms for interacting with computers through movement (e.g., movement interfaces). This requires tackling computational challenges, including modelling, representation, segmentation, recognition, classification, and generation of movement information. It thus promotes an interdisciplinary approach to movement understanding ranging from biomechanics to embodied cognition, to the phenomenology of bodily experience as well as contributions from the performing arts. This year, the conference was hosted at Casa Paganini InfoMus, a research centre of the Department of Informatics, Bioengineering, Robotics, and Systems Engineering of University of Genova.

In the 2018 edition, MOCO hosted several talks regarding specific research issues explored within the project, correspondent to as many conference papers submitted by Consortium partners and a specific timeslot was dedicated to the WPW in the afternoon of day 1, which entailed the same structure experienced in the previous *WhoLoDancE Seminar* in Madrid, but targeted on a more technical level for an audience of university IT researchers, and supplemented with the newly developed mobile similarity search system by Peachnote.

The conference gave the opportunity of several fruitful discussions and exchanges for setting up potential collaborations, such as the ones occurred with Philippe Pasquier (School for Interactive Arts + Technology of Simon Fraser University, Vancouver, Canada), Sotiris Manitsaris and Alina Glushkova (*École des Mines, Paris, France*), e con Olga Perepelkina (Neurodata Lab, Moscow, Russia), with special regard to the project of WhoLoDancE-related ICO.

As the conference has been preceded by the project M30 meeting, it is worth mentioning that the Consortium also took the opportunity to discuss the first version of the project promotional movie, a project designed by K. Danse and realised with the choreographic consultancy and technical support of all



Figure 16. Casa Paganini InfoMus research centre of the University of Genova.

Consortium, illustrating in practice how the WhoLoDancE approach and implemented tools could be employed for innovative choreographic creation. The work on the movie, realised from 30 May to 2 June at Casa Paganini InfoMus, is still in progress for reduction and refinement, in view of having it ready to be shown in the upcoming dissemination events, Romaeuropa Festival above all.

Partners	Title	Contribution type	Timeslot	Conference paper
Rosemary Cisneros, Sarah Whatley (Covuni), Katerina El Raheb (Athena RC) and others	MOCO Annotation Workshop	Workshop	June 28, 9:00 – 12:30	-
Lynkeus, Athena RC, Polimi, UniGe, Covuni, Peachnote, K. Danse, Stocos, Lykeion to Hellenidon	WhoLoDancE Performative Workshop	Workshop	June 28, 13:30 – 15:30	-
Katerina El Raheb (Athena RC), Sarah Whatley (Covuni), and Antonio Camurri (UniGe)	A Conceptual Framework for Creating and Analyzing Dance Learning Digital Content	Paper session	June 29, 9:25 – 9:50	El Raheb K, Whatley S, Camurri A (2018) A Conceptual Framework for Creating and Analyzing Dance Learning Digital Content. ACM (In press)
Marina Stergiou, Katerina El Raheb, Akrivi Katifori, and Yannis Ioannidis (Athena RC)	An interactive gamified experience for understanding directionality and familiarize with Laban Symbols	Demo session	June 29, 10:00 – 16:00	-
Daniel Bisig, Pablo Palacio, Muriel Romero, and Arnaud Pérez (Stocos)	Sounding Feet - Sonifying Foot Pressure for Dance	Performance	June 29, 18:20	-
Daniel Bisig, Pablo Palacio, Muriel Romero, and Arnaud Pérez (Stocos)	Sounding Feet - Sonifying Foot Pressure for Dance	Demo session	June 30, 10:30 – 11:00, 13:00 – 14:00, 16:00 – 16:30	-
Katerina El Raheb, Aristotelis Kasomoulis, Akrivi Katifori, Marianna Rezkalla and Yannis Ioannidis (Athena RC)	A Web-based system for annotation of dance multimodal recordings by dance practitioners and experts	Paper session	June 30, 9:00 – 9:25	El Raheb K, Kasomoulis, Aristotelis Katifori A, Rezkalla M, Ioannidis Y (2018) A Web-based system for annotation of dance multimodal recordings by dance practitioners and experts. ACM (In press)

Table 2. Overview of the contributions of the Consortium to MOCO 2018.

### Minor dissemination events

Other minor dissemination events held during the year are reported below.

Event type	Title	Date	Location	Partner and role	Audience
Conference with presentation	2 <sup>nd</sup> Congress Performing Arts in Education: collectivity, thought and experience	22-23 March, 2018	Patras, Greece	Athena RC, presenter	Academic
Science Festival with demo	ASF2018 (Athens Science Festival)	24-29 April, 2018	Athens, Greece	Athena RC, presenter	Non-specialised
Workshop with presentation	CrossCult's & Emotive's Workshop	14 May, 2018	Athens, Greece	Athena RC, presenter	Academic
Conference with paper presentation	International Conference on Advanced Visual Interfaces (AVI) 2018. Paper: Raheb K El, Tsampounaris G, Katifori A, Ioannidis Y (2018) Choreomorphy: a whole-body interaction experience for dance improvisation and visual experimentation. In: Proceedings of the 2018 International Conference on Advanced Visual Interfaces. ACM, p 27	29 May – 1 June, 2018	Castiglione della Pescaia, Italy	Athena RC, presenter	Academic

Table 3. List of minor dissemination events held by the Consortium in the third year of the project (January 2018 to present).

### Meetings with members of the academic community

Besides general dissemination, Covuni has been showcasing the tools to dance experts (teachers, dancers, researchers, choreographers). While they will be extensively reported in the relevant deliverables (D7.3, *Evaluation of learning personalized experience final public report*), the relevant evaluation sessions are briefly described below as part of the dissemination activity, as during both Covuni contributed to inform about projects goals and some underpinned research articles submitted to related academic journals and currently under review.

#### Wolverhampton evaluation, 27 March 2018

Student evaluation with dance students studying at Wolverhampton University (Wolverhampton, United Kingdom). The event took place at the presence of 15 undergraduate dance students as well as dance Science tutors and dance educators from the university. Covuni showed them the annotation and dance segmentation tool and looked at the ways these tools could be useful for their dance learning and practice. The tool was well received, and the participants acknowledged that indeed there was a need for such tools that could enhance their way of seeing, discussing and learning dance.

#### Coventry evaluation, 8 May 2018

Student evaluation with 2<sup>nd</sup> and 3<sup>rd</sup> year dance students at Coventry University. Similarly, to the previous one, the workshop also worked closely with dance students studying choreography and dance performance. Similar feedback was confirmed, and the tools were exciting and inspirational for the group of students and teachers.

**Upcoming evaluation meetings**

Covuni has envisaged, for the last six-months of the project, a broader, systematic evaluation procedure which will involve a list of selected external partners including dance researchers, teachers and choreographers as well as experts of movement-related digital technologies. The evaluation is planned to start in middle September – as soon as the Consortium will have finalised the refinement of project tools and their integration in the WhoLoDancE Framework, along with the production of dedicated tutorial videos - and proceed throughout the last project semester, providing crucial feedback for improvement and customisation to users' needs.

## YEAR 3 – Upcoming (August – December 2018)

## EUSIPCO 2018

<b>Title</b>	26 <sup>th</sup> European Signal Processing Conference	<b>When</b>	3-7 September 2018		
<b>Where</b>	Rome, Italy	<b>Venue</b>	<i>Centro Congressi Auditorium della Tecnica</i>		
<b>Type of event</b>	Conference (with satellite workshop)		<b>Audience</b>	Academic	
<b>Brief description</b>	EUSIPCO is an international research conference focused on the theme of signal processing. The conference will host a satellite workshop dedicated to the project, to be held in the form of the WPW, targeted for an audience of IT experts.				
<b>Self-organised</b>	No	<b>Leading organiser</b>	Polimi	<b>Participation</b>	All Consortium
<b>Dissemination</b>	Website, Twitter, Facebook				



The 26<sup>th</sup> European Signal Processing Conference (EUSIPCO 2018), organised by Roma Tre University, will be held from the 3<sup>rd</sup> to the 7<sup>th</sup> of September 2018 in Rome at *Centro Congressi Auditorium della Tecnica*. The conference addresses the latest developments in research and technology for signal processing and its applications through oral and poster sessions, keynotes and plenaries, exhibitions, demonstrations, tutorials, demo and ongoing work sessions and satellite workshops.

Among these, the conference will host the “WhoLoDancE: body motion analysis with applications to dance education and beyond” satellite workshop (7 September 2018), a one-day event where the Consortium will present the latest scientific and technical results, concluding with a performative demonstration session where to showcase the developed technologies in the form of performative dance demonstrations. This will take the structure of the WPW, to be targeted – as for MOCO 2018 - for an audience of expert technologists and IT researchers. The workshop detailed programme and the relevant abstract are reported below.

Time	Presenter	Title
14:00 - 14:20	Edwin Morley Fletcher (Lynkeus)	Making sense of dance movement: the WhoLoDancE project
14:20 -14:40	Stefano Piana (UniGe)	Semantic and emotional representation models: a rule-based approach
14:40-15:00	Massimiliano Zanoni, Augusto Sarti (Polimi)	Semantic and emotional representation models: a learning-based approach
15:00-15:20	Michele Buccoli (Polimi), Stefano Piana (UniGe)	Demonstrations and applications to high-level movement analysis
15:20-15:40	Vladimir Viro (Peachnote), Stefano Piana (UniGe)	Movement-based similarity analysis: applications to searching and sketching

15:40-16:00	Vladimir Viro (Peachnote), Michele Buccoli (Polimi), Stefano Piana (UniGe)	Demonstrations and applications to movement search
16:00 - 16:20	Katerina Elraheb (Athena RC)	Movement libraries and applications: search, browse, annotate, visualise and interact with dancing bodies
16:20 - 16:40	Coffee break	
16:40 -18:30	Performative demonstration session: <ul style="list-style-type: none"> <li>• Flamenco dance and movement segmentation</li> <li>• contemporary dance, multimodal interaction and dance-driven music generation</li> <li>• movement blending and application to choreography</li> <li>• Choreomorphy: dancing avatar design based on movement quality</li> <li>• VR in dance performance</li> <li>• synchronicity in Greek dance</li> <li>• Greek dance open session (all invited!)</li> </ul>	

Table 4. Programme of the satellite workshop "WhoLoDancE: body motion analysis with applications to dance education and beyond satellite workshop" to be held within EUSIPCO 2018.

### Workshop abstract

*Technologies for motion capturing have evolved very rapidly in the past few decades. In addition to professional motion capturing systems, today we can count on commercially available low-cost devices that allow us to gather motion information in everyday environments; and all sorts of sensing devices that allow us to complement this information with other multi-modal signals coming from sounds, muscle contraction, breathing, accelerometers, gyroscopes, etc.*

*When the goal of this multi-modal analysis is to make sense of dance movements, we are suddenly faced with additional layers of information to extract and analyse at all levels of abstraction. Similarly to what happens in the field of music information retrieval, dance offers a structured language for describing, planning and designing the emotional trajectories that can be elicited and evoked by dance movements, to make sense of which we need to resort to advanced signal processing solutions, from low-level trajectory analysis, to high-level movement quality assessment based on machine learning. The Wholodance project approaches exactly such problems from all points of view.*

*The main focus of the WhoLoDancE workshop is to bring together experts of dance movement analysis coming from both sides of the spectrum: scientists who focus on movement analysis and quality assessment, as well as dancers, who help scientists make sense of descriptors that are often hard to pinpoint and formalize. This workshop will present the latest scientific and technical results achieved by the Wholodance Consortium and will showcase the developed technologies in the form of performative dance demonstrations.*

## Romaeuropa Festival 2018

<b>Title</b>	Romaeuropa Festival 2018	<b>When</b>	7 October 2018		
<b>Where</b>	Roma, Italy	<b>Venue</b>	La Pelanda		
<b>Type of event</b>	Festival of contemporary arts		<b>Audience</b>	Non-specialised	
<b>Brief description</b>	Romaeuropa Festival is a contemporary arts festival. The festival will host a one-day event dedicated to the project, composed of video projections, an interactive laboratory (in the form of the WPW, targeted to a non-specialised audience), a dance performance (K. Danse, Stocos) and a timeslot dedicated to public discussion.				
<b>Self-organised</b>	No	<b>Leading organiser</b>	Lynkeus	<b>Participation</b>	All Consortium
<b>Dissemination</b>	Website, Twitter, Facebook				

# REF ROMAEUROPA FESTIVAL 2018

Initiated in 1986 and accompanied by growing success, the *Romaeuropa Festival*, now at its 33<sup>th</sup> edition, is currently renown as the most important Italian festival and, according to the Wall Street Journal, one of the top four in Europe for the promotion and diffusion of contemporary arts, theatre, dance and music. Cult and trendy at the same time, in the last thirty years *Romaeuropa Festival* has presented the best of today's artistic production, boasting a devoted and constantly increasing public. Composite as its public, the festival knocks down conventional barriers between "high" and "mass" culture, in the name of exchange, union and intertwine of culture and expressive codes. Each year Europe, America, Oceania, Asia, Africa meets in the Italian capital in a spectacular weave of dance, theatre, music, cinema, meetings with artists, visual arts and technological challenges. Sounds and artistic expressions of five continents build an intense, aesthetic experience stretched over two months of performances into an articulated geography of spaces.

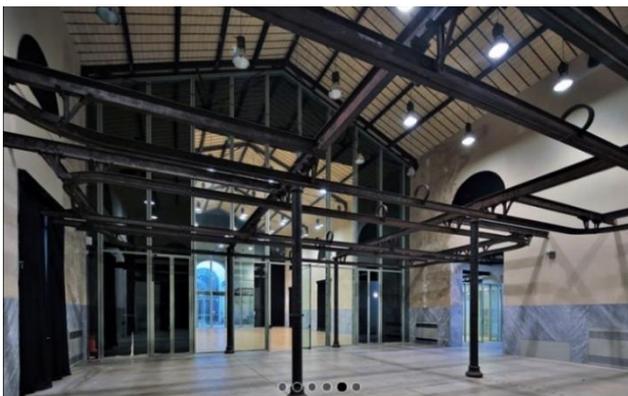


Figure 17. La Pelanda cultural centre, Rome, Italy.

The festival will be hosting a WhoLoDancE-dedicated event, entitled "WHOLODANCE EXPERIENCE - LAB & Performance @ Romaeuropa Festival" (7 October, *La Pelanda* cultural centre, 13:30 – 17:30), composed of four interconnected activities: (1) the projection of *WhoLoDancE videos* focused on the project tools and their potential application in choreography, 13:30 – 14:00; (2) an *interactive laboratory*, based on the WPW format and targeted to a non-specialised audience, including web-based demos, live dance demonstrations with multimodal tools and hands on

sessions, 14:00 – 16:00; (3) a live *dance performance* co-realised by K. Danse and Stocos specifically for the occasion, 16:30 – 17:00; (4) a *meeting with the public* to discuss achievements, open challenges and potential applications of the WhoLoDancE approach to dance and other connected, movement-related disciplines (e.g., sports, wellness, rehabilitation, etc.), as well as to present future crowdfunding opportunities through the planned launch of an ICO, 17:00 – 17:30. The event will be hosted at the cultural centre *La Pelanda*, a former slaughterhouse which has now become a living space for events and temporary exhibitions.

## Festival della Scienza

<b>Title</b>	Festival della Scienza		<b>When</b>	27 October 2018	
<b>Where</b>	Genova, Italy		<b>Venue</b>	Casa Paganini InfoMus	
<b>Type of event</b>	Science festival		<b>Audience</b>	Non-specialised	
<b>Brief description</b>	Festival Della Scienza is a science festival composed of exhibitions and interactive laboratories, events and workshops. The festival will host a project-dedicated event composed of a live demonstration of project tools and possibly a live dance performance, but the final structure is still to be defined.				
<b>Self-organised</b>	No	<b>Leading organiser</b>	University of Genova	<b>Participation</b>	To be defined
<b>Dissemination</b>	Website, Twitter, Facebook				



# Festival della Scienza

*Festival della Scienza* is the leading science festival in Italy and one of the biggest in Europe, accounting for about 200,000 visitors, 300 events and 350 speakers each year. The annual 11-day event, spread across the beautiful historical centre of Genova in about 50 different locations, represents a fixed point of reference for science dissemination where researchers, science enthusiasts, schools and families gather to explore and investigate science crossing over traditional subject boundaries, through exhibitions, interactive laboratories,

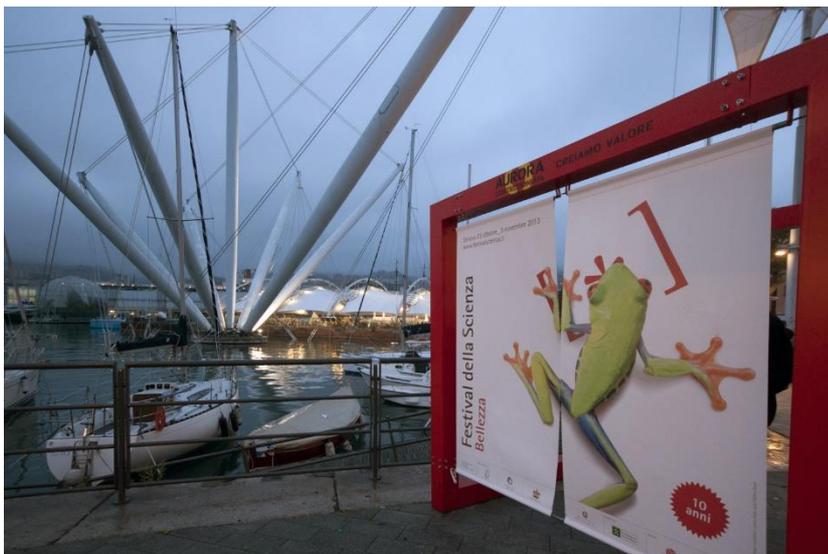


Figure 18. "Festival della Scienza 2013 - Porto Anti" (CC BY-SA 2.0) by Festival della Scienza.

meetings, workshops, shows and conferences ranging from mathematic, natural and human sciences.

This year, the Consortium will take part in the event with a live dance performance (October 27, Casa Paganini InfoMus), articulating as a live demo path exploring the various tools developed during the project and possibly final dance performance, but the final structure will be defined in the following weeks.

## EUROMED 2018

<b>Title</b>	6 <sup>th</sup> International Euro-Mediterranean Conference	<b>When</b>	29 October – 3 November 2018		
<b>Where</b>	Cyprus	<b>Venue</b>	Filoxenia Conference Centre		
<b>Type of event</b>	Conference (with interactive workshop)	<b>Audience</b>	Academic		
<b>Brief description</b>	EUROMED is an international research conference dedicated to approached to preservation of cultural heritages. Besides participating as attendees (Athena RC), a conference paper has been recently submitted as a joint effort of all Consortium partners (under the lead of Lynkeus).				
<b>Self-organised</b>	No	<b>Leading organiser</b>	Athena RC, Lynkeus	<b>Participation</b>	Athena RC
<b>Dissemination</b>	Conference paper, Twitter, Facebook.				



Protecting, preserving and presenting our Cultural Heritage are frequently interpreted as change management and/or change the behaviour of the society. Joint European and international research produces a scientific background and support for such a change. We are living in a period characterized by rapid and remarkable changes in the environment, in the society and in technology. Natural change, war conflicts and man-made changes, including climate, as well as technological and societal change, form an ever-moving and colourful stage and a challenge for the society. Close cooperation between professionals, the policy makers and authorities internationally, is necessary for research, development and technology in the field of cultural heritage. Scientific projects in the area of cultural heritage have received national, European Union or UNESCO funding for more than thirty years. In this context, the biannual EuroMed conference has become a regular milestone on the never-ending journey of discovery in the search for new knowledge of our common history and its protection and preservation for the generations to come. They also provide a unique opportunity to present and review results, and to draw new inspiration. The agenda of this unique conference will include hundreds of excellent oral and poster presentations, as well as workshops and demonstrations from academia and industry, reflecting the wide scope of our work in the area of cultural heritage. The focus of the conference will thus be on interdisciplinary and multi-disciplinary research on tangible and intangible Cultural Heritage, the use of cutting edge technologies for the protection, preservation, conservation, massive digitalisation and visualization/presentation of the Cultural Heritage content (archaeological sites, artefacts, monuments, libraries, archives, museums, etc). At the same time, the event is intended to cover topics of research ready for exploitation, demonstrating the acceptability of new sustainable approaches and new technologies by the user community, SME's, owners, managers and conservators of cultural patrimony.

Besides participating to the conference as attendees (Athena RC), the Consortium has recently submitted a conference paper ("WhoLoDancE: Whole-body interaction Learning for Dance Education") giving an overview of rationale, objectives, work done so far, achieved results, the state-of-the-art of the project development, as well as lesson learned and open issues. The paper, prepared under the lead of Lynkeus with contributions from all Consortium partners, was submitted on July 20<sup>th</sup> and is currently under review.

## Appendix

### WhoLoDancE Performative Workshop

#### Objective

The *WhoLoDancE Performative Workshop (WPW)* aims at offering interested audiences an «experiential journey» whereby they discover and/or deepen their knowledge of 4 different dance genres and participate directly in the various ways innovative digital technologies, developed within the EU-funded WhoLoDancE research and education project, are integrated in new pedagogical processes for teaching, learning and creating dance movements.

Amongst these technologies: high precision motion capture, algorithmic treatment of data, annotation of movement principles and qualities, segmentation, machine learning and similarity search, blending engine, sonification, movement sketching, etc.

#### Spatial configuration for the WPW

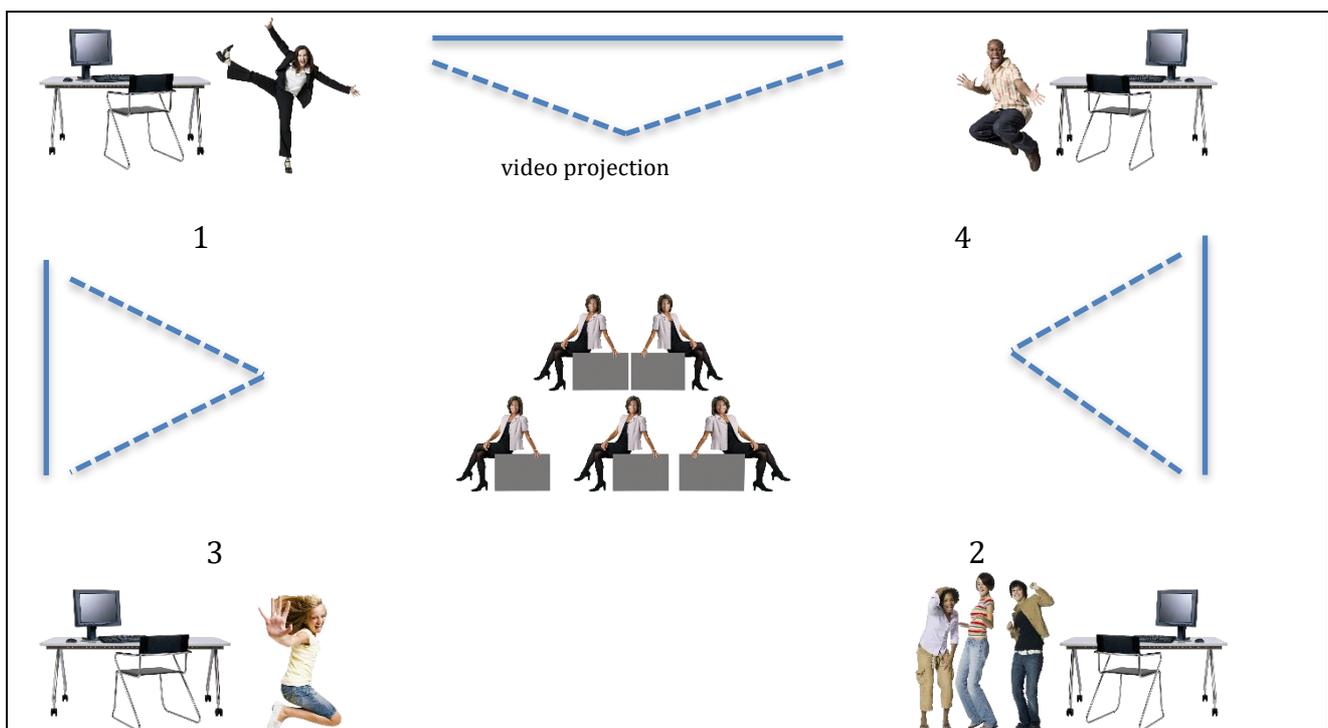
A large room (either a large enclosed rectangular space or a proscenium stage with front curtains closed) of approximately 15 m wide by 10 m deep.

2 options are available, depending on spaces (dimensions, orientation), contexts and total number of participants:

- 4 interactive set-ups / 1 experience per set-up, in sequence or simultaneously if a very large space is available (to avoid sound interferences)
- 1 single interactive set-up / 4 experiences, in sequence

#### Option 1

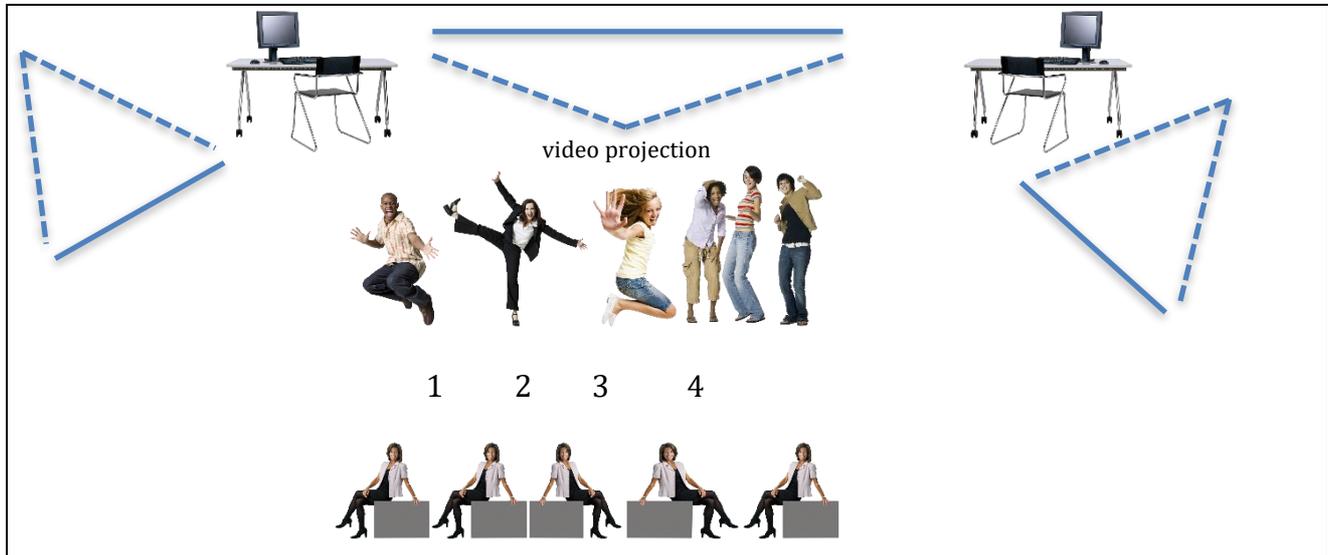
4 interactive set-ups are spread around, on the periphery of the space; each one is dedicated to a dance genre, appearing one after the other, while the others attend, on pause.



Audience is in the centre of the space, either standing up or seated on chairs, which are easy to move around, and rotate, so that they can orient themselves in any given direction, depending on the timing of the workshop.

### Option 2

1 single interactive set-up accommodates, alternatively, one dance genre.



In this option, computer installations are duplicated to prepare the next experience while the audience is experiencing the current one.

Audience is facing the interactive set-up, either standing up or seated on chairs, which are easy to move around, so that some audience members can easily move in the central space and participate in an experience.

### **General description**

The idea behind this approach is to avoid a process bound to be a sole technological display of tools, but rather an approach that invites audiences to discover the WhoLoDancE project from a pedagogical and artistic perspective.

Each module is dedicated to an experience of a dance genre: ballet, contemporary, flamenco, and Greek dances.

Each module displays the necessary dancing space (audience either in the centre or facing frontally can freely move around and open up for more space if necessary), its own technical equipment (tables, chairs, computers, projection screens, and WhoLoDancE related tools ready to be used and demoed, Choreomorphy, 1 screen and 1 video projector, 1 sound stereo system, 1 or 2 hanging lights above the station, 1 table, chairs, and electrical extensions with multiplugs connectors, blending engine, holographic devices).

The proposed idea includes:

- what is specific to each dance genre
- what they may have in common

So that a double journey takes place for the audience: they go and “travel” from one dance genre to another, according to a specific timing which could be approximately 20 mins each (if the

total duration of the show is 1 hour 30 minutes) and they also discover what the 4 dance genres may have in common.

The WhoLoDancE dance partners propose several dance-connected scenarios, either in terms of movement principles, movement qualities, choreographic compositional motifs, teaching procedures, etc. which can be common to:

- ballet and contemporary dance
- ballet and flamenco
- ballet and Greek dances
- Greek dances and contemporary dance
- Greek dances and flamenco
- flamenco and contemporary dance

These shorter sequences are used as transitions to “travel” from one dance genre to the next.

### The 4 experiences

Each dance genre proposes:

- a learning scenario including what it’s specific to it and what can be considered having in common with other dance genres, performed in approximately 20 mins
- WhoLoDancE related tools (brief description) plus, eventually, specific videos
- performing dancers
- scientific and technological partners who help perform the demonstration (present on stage and travelling also in between stations)
- audience members willing to experience themselves a short demo (others still sitting can simply watch and enjoy the demo)
- an appropriate space for dancing.

Video projections are also used to play videos of the making of (motion capture recordings, experimental tests, images from workshops and past forums, etc.).



*WhoLoDancE Performative workshop – Naves Matadero, Madrid, Spain*

**Flamenco dance (Rosa Cisneros, COVUNI)**

“LEGO Flamenco”

*Learning scenario, description, duration*

Total duration of 20 minutes is divided into 2 rounds of 10 minutes and audience is invited to dictate the style of Flamenco and movement quality that the performer dances.

The dancer has a repository of slower and faster dances or phrases prepared.) In the first round (the slower round) one audience member (selected at random) has a list of the different qualities and the performer is told the quality which has been chosen. The dancer then performs the phrase in a more traditional way without the technology (e.g., Solea) and then dances the phrase with the annotation tool and/or in front of the segmentation tool. There is a duet with the technology. This cycle is repeated by the dancer but with another audience member choosing a quality and then the dancer pieces both phrases together. Then this moves on to the next Genre. After all genres have been performed the blending engine is presented and shows how it allows for the LEGO Flamenco to happen in infinite ways.

*Related tools being used*

Blending engine, Choreomorphy and/or annotation and segmentation tools.

*Number of dancers involved*

Rosa Cisneros and one other flamenco dancer.

*Scientific and technological partners who help perform the demonstration*

In the case of the blending engine, it is user-friendly. Choreomorphy and segmentation tools have technical people either from Athena RC or Polimi.

*Number of audience members that can be incorporated: 1-3**Space required for the dance*

Flexible as flamenco can often be performed in intimate spaces as well as larger spaces.

*Technical needs*

- 1 screen and 1 video projector
- 1 multichannel octophonic sound system (adaptable depending on the venue)
- 1 or 2 hanging lights above the station
- 1 table, chairs
- electrical extensions with multiplugs connectors

### **Ballet dance (Muriel Romero, Stocos)**



#### *Learning scenario, description, duration*

A ballet dancer is taught a variation with steps taken from the repository. She executes it with as much precision as possible. Then the dancers, teachers and guest choreographers will learn to analyse this variation with the different WhoLoDancE tools.

#### *WhoLoDancE related tools being used*

Blending engine, similarity research, movement sketching, annotation and segmentation tools.

#### *Number of dancers involved*

One (ballet dancer based in the city the WPW takes place).

#### *Scientific and technological partners who help perform the demonstration:*

All those who have created the different tools that ballet will be used.

#### *Number of audience members that can be incorporated*

2 ballet students, 2 choreographers and 2 teachers.

#### *Space required for the dance*

4 x 4 m

#### *Technical needs:*

1 Linoleum Floor ,1 screen and 1 video projector, 1 sound stereo system, 1 or 2 hanging lights above the station, 1 table, chairs, and electrical extensions with multiplugs connectors.

### Contemporary dance (K. Danse & Stocos)



#### *Learning scenario, description, duration*

A performance demo stages an experimental dialog between a dancer and a computer-based system that can react to the qualitative dimensions of dance movements, internally linked to specific body states and emotional expressions. This workshop/demo explores the creative possibilities of interactively controlling sound synthesis and video to monitor both expressive dance and minute body movements. Such an interactive relationship is interesting since it links the musical outcome to the expressivity of movement, so essential in contemporary dance. 20 mins.

In addition, an example of how to create an original dance sequence is displayed with the help of the Blending engine, utilising a combination of existing recorded material, taken from the library of motion captured dances.

#### *WhoLoDancE related tools being used*

Microsoft Kinect for Windows V2 to capture dancer's movements and position on the stage

Laptop PC that runs EyesWeb based analysis modules

XOSC IMU (or Pablo's) sensors for movement analysis (real-time feature extraction) used in particular for sonification and Movement sketching

MYO sensors to measure muscular activation and tension used also in movement analysis to control visual output and sonification

Wireless router to stream data from IMU's

Audio equipment

Laptop running the blending engine

*Number of dancers involved:* 2, Marianne Masson and Muriel Romero

*Scientific and technological partners who help perform the demonstration:* Stefano Piana (InfoMus)

*Number of audience members that can be incorporated:* One at a time

*Space required for the dance:* 4x4 m minimum

#### *Technical needs*

1 projection screen and 1 video projector

1 sound stereo system

1 or 2 hanging lights above the station (plus a manual dimmer board to control the lights above each station), 1 table, chairs, and electrical extensions with 10 power plugs.

### Traditional Greek dances (Lykeion ton Hellenidon, Amalia Markatzi)



#### *Learning scenario, description, duration*

Since Greek traditional dances are not known as the other 3 genres of dance, an introduction with videos and pictures will help the audience to have an idea for the main characteristics of Greek dances, concerning the schema, the costumes, the music, the participation of many dancers. Through video and/or pictures the audience will follow moments of the mocap in Amsterdam for specific Greek dances. The dancer (s) will dance the dances, so that the audience will have the opportunity to make his own remarks. Then they will be invited to try with the teacher, simple kinetic motives and full dances, with emphasis to specific principles and qualities. These dances can be found in the Movement Library, so that the dialogue with the technical partners will follow, for the presentation and reasoning of the innovative tools of the project.

#### *WhoLoDancE related tools being used*

Wholodance Movement Library, Annotator Interface.

*Number of dancers involved:* 1 or more

*Scientific and technological partners who will help perform the demonstration:* Athena RC.

*Number of audience members that can be incorporated:* around 15 people

#### *Space required for the dance:*

For 10-15 people 5 X 6 or larger (because people will have to move in a circle, which is difficult if there is no space).

#### *Technical needs*

Video projection, sound, lights, tables, chairs, and electrical connections

- 1 screen and 1 video projector
- 1 sound stereo system
- 1 or 2 hanging lights above the station
- 1 table, chairs

electrical extensions with multiplugs connectors

## The “journey”, proposed sequence of events for the 4 experiences

### Introduction

A short video showing the four dance genres (original sequences with and without costumes, with a specific number of dancers usually performing each genre, with their own music), helps the audience have an overview of the core dance “material” used in the WhoLoDancE project.

This video is enriched, for each genre, with audio explanations for some characteristics of the dances, helping the “story” being displayed.

### **Sequence of events**

Audience members “visit” the stations one at a time. This creates a narrative around how the different tools are used. A leader (or 2, 3, 4) does the presentation and introduces (very briefly) the next experience to the audience (the narrative unrolls as it goes).

Each experience has its own timing (e.g., flamenco has 2 rounds, a slow one and a more dynamic one)

- first the demo is displayed with one (or several) professional dancer
- then audience members are invited to participate in a similar experience

Hanging lights help focusing on each station, one at a time, so that while only one is properly lit the other 3 remain in low light.

Transitions in between dance genres display a short presentation of what the choreographic elements have in common.

The overall duration, for each experience, does not exceed 20 minutes.

The overall duration of the Performative Workshop is around 1h 30 minutes.

Finally, a common participative dance is offered to all audience members.



*“Sirtaki group dance” (WhoLoDancE) by Amalia Markatzi*

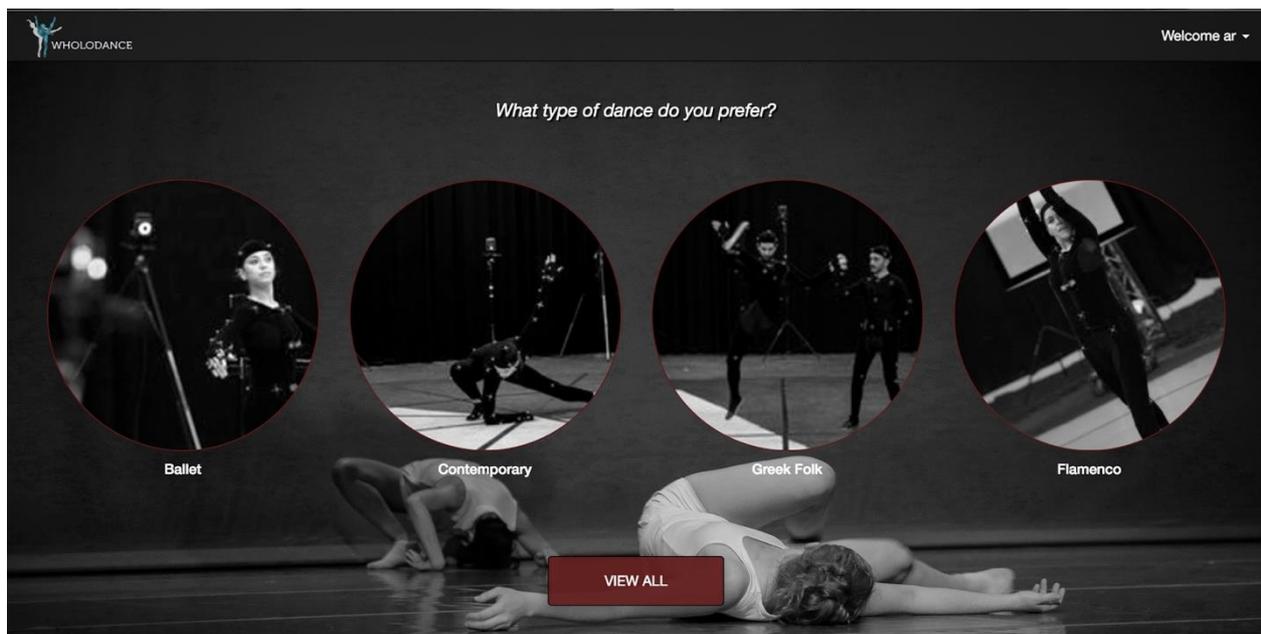
## Available technological tools

### > Annotator-WhoLoDancE Movement Library (ATHENA RC)

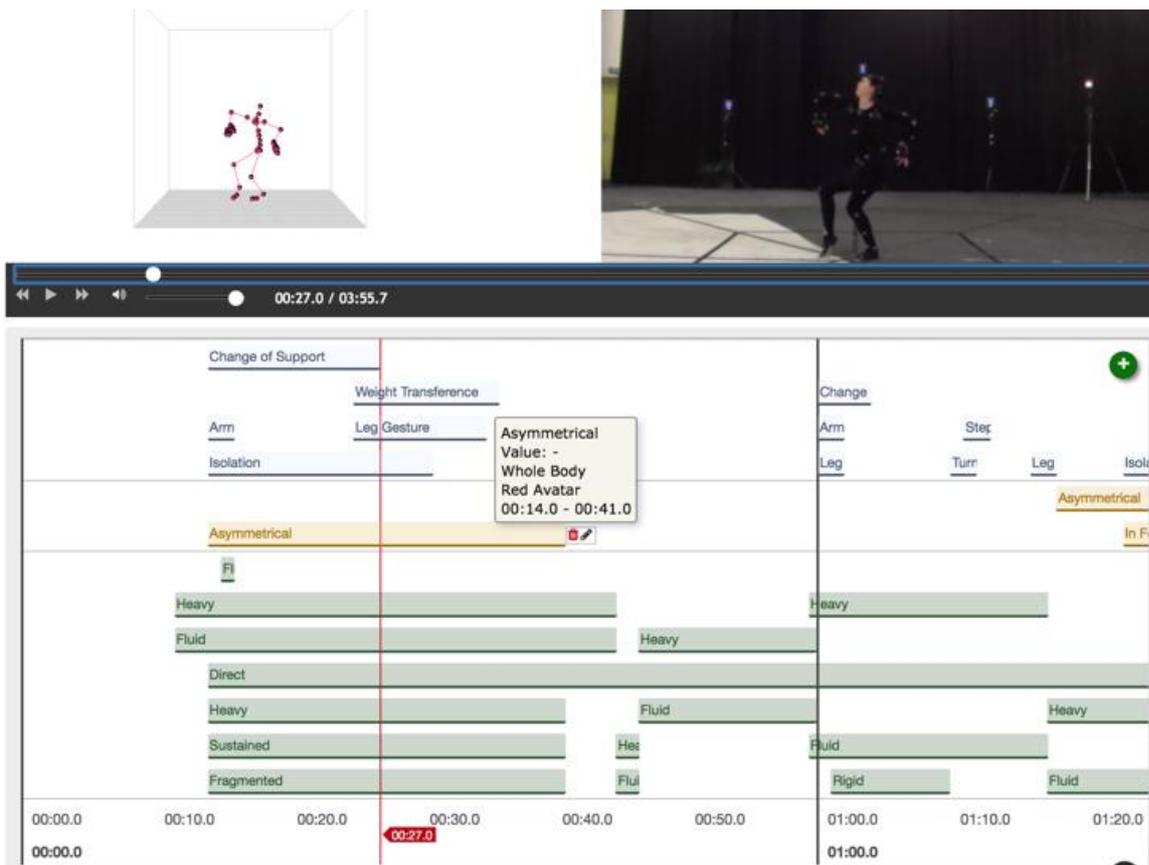
The main objective of the WhoLoDancE Movement Library (WML) (application is to provide access to the WhoLoDancE repository, through an intuitive interface with browsing, searching, visualization and annotation functionalities for the multimodal recordings.

Making the motion capture data available to the dance practitioners is one of the most significant needs that have emerged during the WhoLoDancE project. Towards that direction, the development of the WML application aims to provide an effective and usable connection between users and the WhoLoDancE repository.

More specifically, the user can browse the recordings by dance genre, and search by using keywords that are included as metadata associated to the recordings. A multimodal player has been developed, which allows the synchronized playback of a video alongside with the corresponding motion capture file. Moreover, not only do users can view the recordings but also to annotate them. Finally, a table and a timeline that operates as viewer for the annotations has been developed.



*WML home page*



Annotator screenshot

### Technical needs

Dimensions of required space: depends on the scenario

Furniture: Table or booth. It is better to advice participants to bring their own laptops with Chrome installed

Video: -

Sound: -

Lights: -

Electrical multiplugs: 1-2 for charging our computers and participants

Electrical extensions:

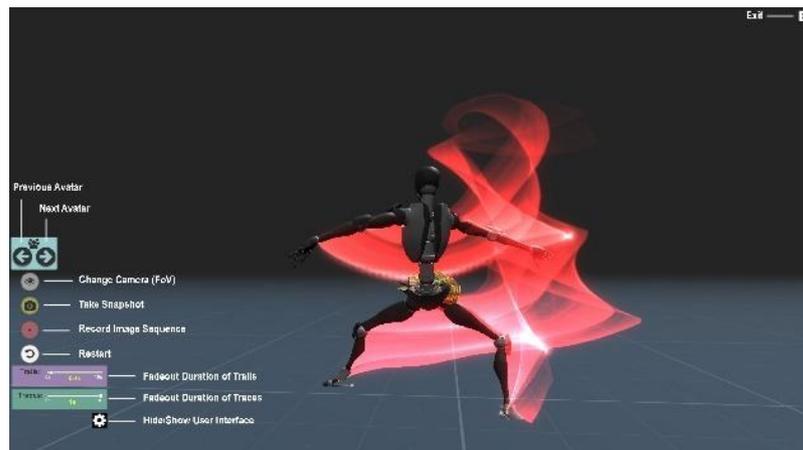
Wi-Fi /wired internet connection (Could you please check if we WML page

([http://dl132.madgik.di.uoa.gr:8084/Wholodance\\_Movement\\_Library/login](http://dl132.madgik.di.uoa.gr:8084/Wholodance_Movement_Library/login)) loads from using the Wi-Fi of the venue?)

## > **Choreomorphy** (ATHENA RC)

Choreomorphy is a whole-body interaction interface that allows a user to visualize their movement in real time using motion capture technologies. The interface allows a user to change avatars and different visualizations in real time, to focus on specific aspects of their movement such as traces, trails, and volumetric space and improvise while seeing themselves as different avatars and shapes and interact with virtual objects.

Choreomorphy consists of two versions: the standalone application which has been described above and the web-based that loads pre-recorded motion capture animations from the WhoLoDancE repository. It is planned to be integrated into the WhoLoDancE Movement Library for optimized viewing purposes.



*Basic Interface (Screenshot of the tool)*



*Choreomorphy installation in Toulouse – (photo copyrights WhoLoDancE-credit Fabien Leprieult)*

### **Technical needs**

Dimensions of required space: at least 3x3 for the dancer and the rest of the space for the pc user (desk and chair) and the people who are inside the room

Furniture: A desk and chair

Video: Projector and long HDMI cable

Sound: Strong Speakers + Subwoofer that cover efficiently the room

Electrical multiplugs: 2

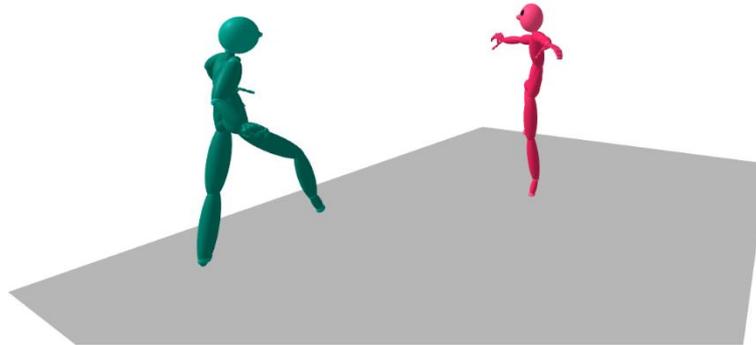
A fine wi-fi, or wired internet connection

> **Low-End VR platform** (Polimi)

The low-end VR platform allows user to visualize motion capture of dance performances as an immersive VR experience by using a low-cost VR support, such as the Google Cardboard and an everyday smartphone. The platform supports the tracking of the orientation of the head, so when the users looks around, the visualization of the virtual 3D environment changes accordingly. The platform relies on the use of web technologies and a browser is the only app needed: there is no need to install any specific application.

From an architectural point of view, the platform represents a visualization layer that can be placed on the top of the previously mentioned applications: to browse the Movement Library and then visualize movements in the VR environment; or in the similarity search system to visualize the query movement side by side to the results of the search.

The modules implemented in the platform include: a standard avatar to view the mocap recordings; a system to watch videos on virtual walls; customizable 3D environments.



*The last version of the avatar for dance performances*



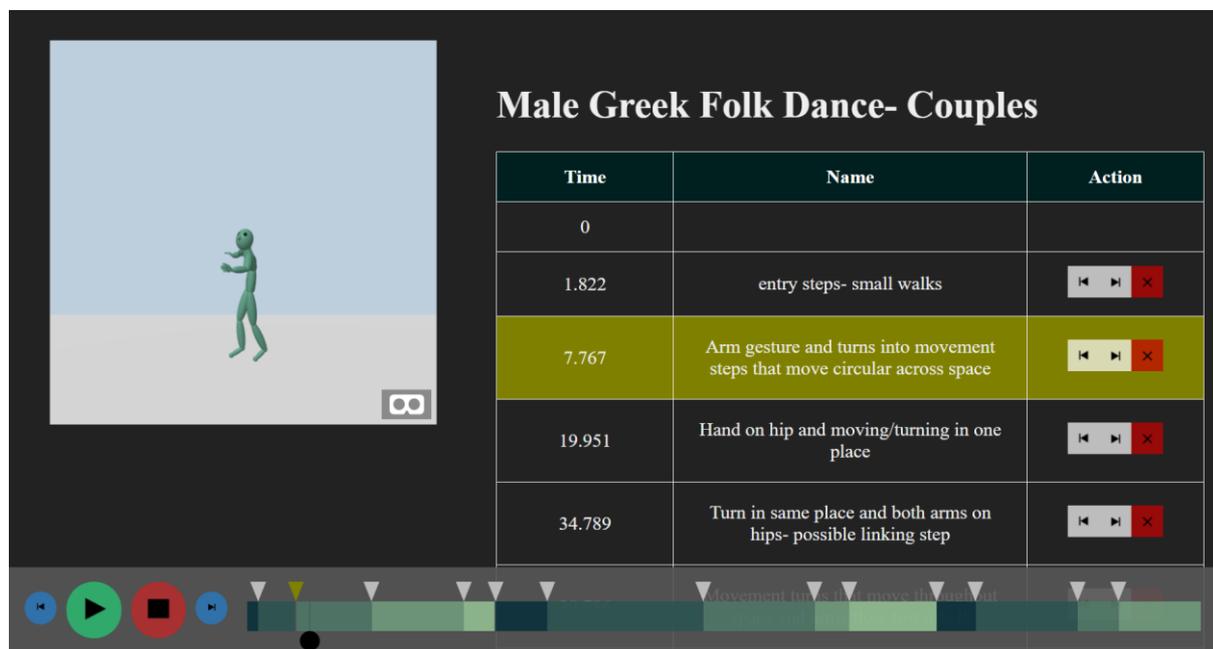
*Amalia Markatzi, from LCGW, trying an application built with the low-end VR platform.*

### > Segmentation Tool (Polimi)

The segmentation tool allows users to manually segment motion capture of dance performances. Users can annotate the performance while watching them. The annotated segments are used by Polimi and UniGe to develop automatic tools to segment dance performances. As a matter of fact, the tool can also be used to inspect and manually correct the result of an automatic segmentation task. Automatic segmentation can also be loaded, visualized and modified.

The tool is based on the same technologies of the Low-End VR platform and is therefore a web application that users can access from anywhere.

The tool includes: a 3D scene, that users can rotate the scene, zoom in/out and switch to/from full-screen view; a player to control the execution and seek the performance frame by frame; a table to show the annotated segments, with possible labels and commands to modify them. These three modules are interconnected: segments in the table are also shown in the player (as a coloured progress bar) and in the 3D scene, with the avatar changing colour when a new segment occurs during the performance.



The screenshot displays the Segmentation Tool interface for a 'Male Greek Folk Dance- Couples' performance. On the left, a 3D scene shows a green avatar performing a dance move. On the right, a table lists annotated segments with their start times, names, and actions. Below the table is a playback control bar with a progress indicator and various control buttons.

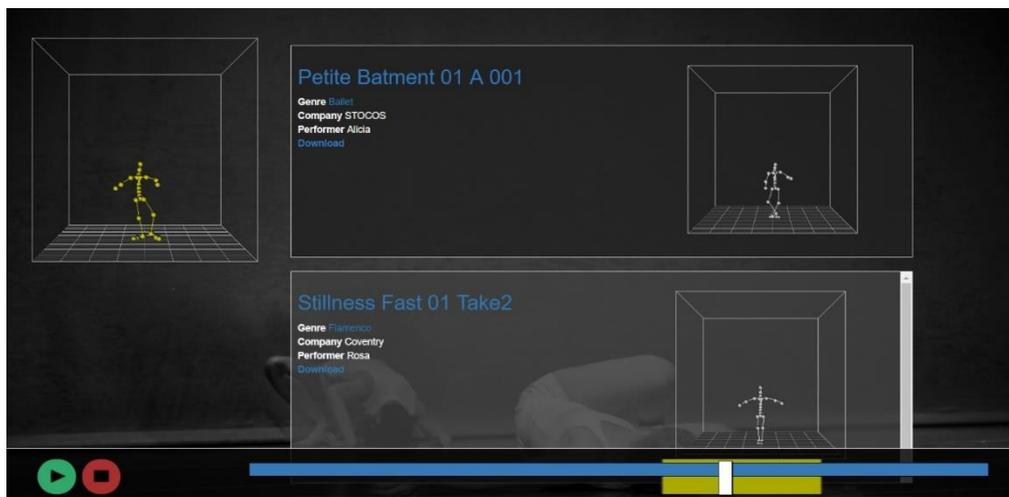
Time	Name	Action
0		
1.822	entry steps- small walks	⏪ ⏩ ✖
7.767	Arm gesture and turns into movement steps that move circular across space	⏪ ⏩ ✖
19.951	Hand on hip and moving/turning in one place	⏪ ⏩ ✖
34.789	Turn in same place and both arms on hips- possible linking step	⏪ ⏩ ✖

*A manual segmentation of a Folk Greek dance.*

### > Similarity search (Peachnote / Polimi)

The Similarity Engine allows to assign value that estimates how much two movement recordings are similar with each other. Since the evaluation of the similarity between two movements depends on the criterion that is taken into consideration, the similarity engine is based on a pure comparison algorithm between the movements' features, which can be seen as the evolution over time of movement properties during the recordings. Since the features may have a different relevance in the estimation of the global similarity, the similarity engine allows to specify a *weighted template*, i.e., to specify how it should weigh similarity in different features when combining them.

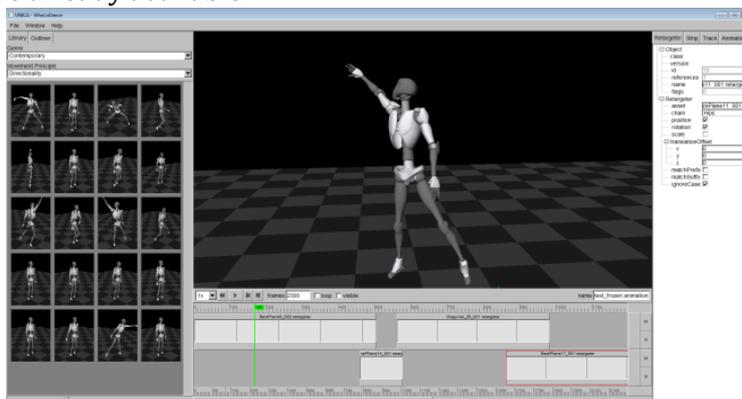
We developed a web-based prototype of a search engine using the similarity engine. Given a large library of movements, the user can start from one, select an excerpt of 5 seconds, and a weighted template of features. The system returns a list of motion recordings sorted according to their similarity to the query. The user can watch the *query* segment and the results, which are played simultaneously and side-by-side, to help the comparison.



A screenshot of the similarity search with the query movement (left) and the list of results (right).

### > Blending engine (Motek)

The basic function of the software is the interactive blending and composition of sequences of movements based on the mocap data that are already available in the library of movements. The sequences are not only assembled in a linear setup, where the combined movement segments appear in their original form, i.e. identical to the segments in the repository of movements, but also a parallel blending is possible, where the consecutive segments are a superposition of segments from the repository. This means that the blending machine allows the users create new movements based on the ones that are already available.



### > Movement sketching (InfoMus)

During the workshop the movement sketching tool is presented, participants use the tool to query the WhoLoDancE repository by performing a movement and/or dance sequence: movements of the participants are being recorded through simple low-end motion capture devices, analysed and used to query the repository to get similar movements (similarity will be tested against a selection of movement qualities). Movement Sketching allows dance students, and dance experts to compare their movement with the ones of professional dancers stored in the repository, results of the query will be visualized using both standard and virtual reality displays.

#### Technical needs

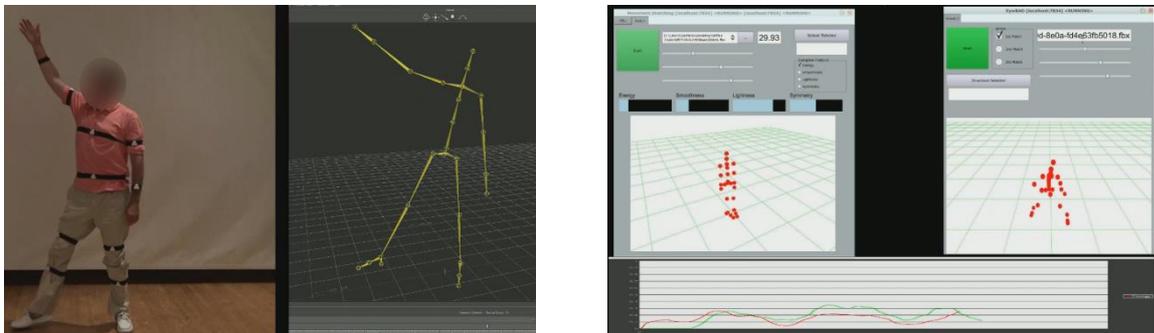
Dimensions of required space: at least 3X3 for movement recording

Furniture: Table or Booth

Video: Video Projector

Electrical multiplugs: 1-2 for charging our computers and devices near the table/booth

Wi-Fi /wired internet connection



*Sketching tool by InfoMus*

### > Sonification / visualization of movement qualities (InfoMus /Stocos / K. Danse)

A Kinect V2 camera, several EyesWeb based analysis modules, XOSC IMU sensors and MYO sensors are used to capture and analyse in real time dancer's movements and positions on stage, and to measure muscular activation and tension. Qualities of movements are associated with visual output and various elements of sonification.



*Performative workshop – WhoLoDancE – Naves Matadero, Madrid, Spain*