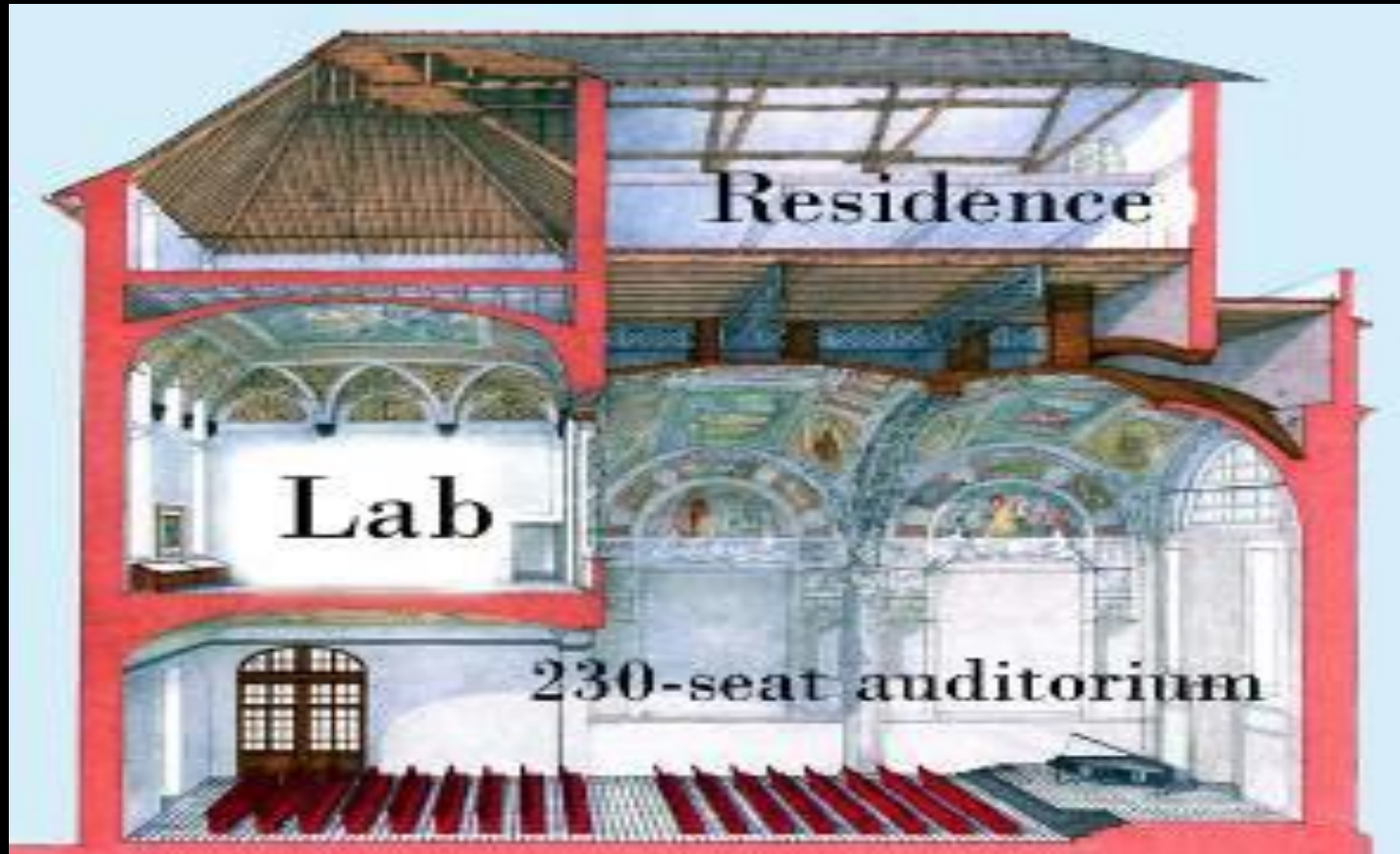


# *casa/Paganini* infomus



The mission of Casa Paganini – InfoMus Research Center consists of carrying out scientific and technological research on human-centered computing where art and humanistic culture are one of the fundamental sources of inspiration.



Contemporary reuse of a monumental building as a site for scientific research (S. Maria delle Grazie La Nuova, Genoa).

# Research

- Cross-fertilisation between research in science and technology and humanistic and artistic research
- **Art for ICT:** Artistic and humanistic theories as source of inspiration for scientific-technological research
- **ICT for Art:** Research results from science and technology as a source of inspiration for art languages and artistic projects

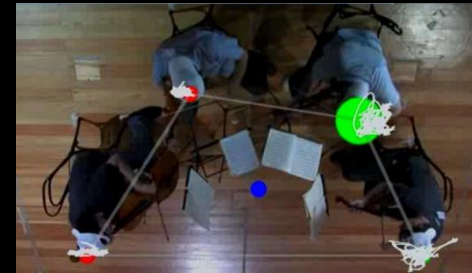
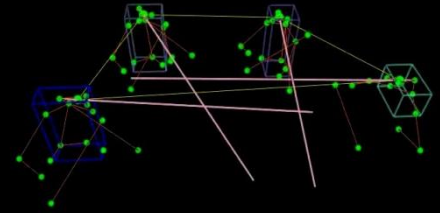
A.Camurri, G.Volpe (2016), “The Intersection of art and technology”, *IEEE Multimedia*, Vol.23, No.1.



# Examples of scientific projects at Casa Paganini - InfoMus based on cross-fertilisation of ICT and art

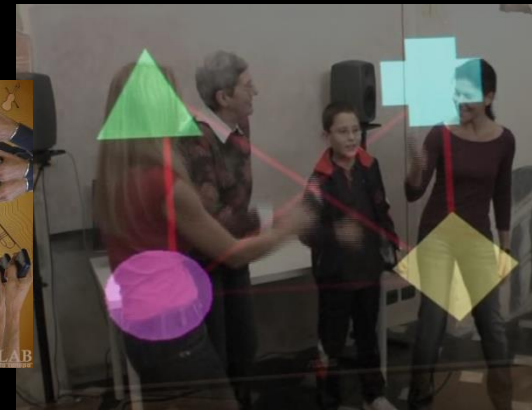
From artistic project...	...to S&T research
Music Theatre Opera "Outis" Luciano Berio Teatro Alla Scala di Milano (1996)	Invisible interfaces for on-stage interaction and synchronisation with audio
Music Theatre Opera "Cronaca del Luogo", Luciano Berio, opening Salzburg Festival (July 1999)	Real-time analysis of full-body movement, non-verbal expressive behaviour qualities. The EyesWeb software platform.
Music Theatre Opera "Un Avatar del Diavolo", Roberto Doati, La Biennale Venezia (2005)	Tangible acoustic interfaces: give the sense of touch to everyday objects
Museum "Enrico Caruso", permanent interactive installation	Visitors non-verbal behaviour analysis for active experience of Caruso voice
EU FET11 Closing Performance: "TanGO Touching Music" (6 May 2011)	Performance built upon scientific results of the European ICT FET SIEMPRE Project.
Study of music joint performance: string quartets, orchestra sections	S&T research in EU ICT FET SIEMPRE Project

# Research



Real-time multimodal analysis of expressive gesture, non verbal affective and social signals in ecological environments

Active experience of cultural heritage



(Socio-mobile) active music listening

# Research



Therapy and rehabilitation:  
interactive software  
to support patients with  
disabilities

Education: interactive  
software for education in  
performing arts



*Graphics by Compedia*

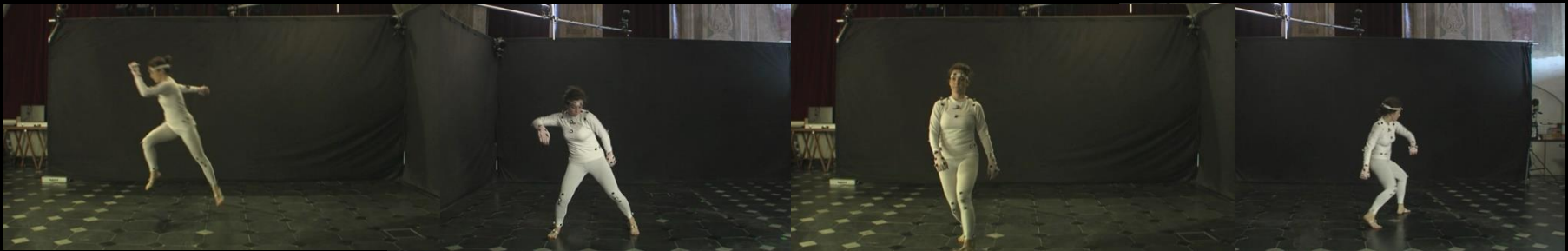


Interactive sonification



# EU-H2020-ICT DANCE

- Consortium:
  - Casa Paganini-InfoMus, Univ Genoa (Coord)
  - Maastricht University
  - KTH, Stockholm
- Close your eyes to perceive the deep expressive qualities in movement
- Computational models and systems to measure full-body non-verbal language of bodies that communicate
- “To listen to a choreography”, “to feel a ballet”
- Focus on blind as well as non blind people



# EU-H2020-ICT DANCE

- Atlante del Gesto\_Genova, Virgilio Sieni, November 2016- March 2017
- Dancers and 150 audience members as active participants



The image is a screenshot of a Facebook page for 'L'atlante del gesto\_Genova'. The page features a cover photo of a group of people in a dance studio, with logos for 'MUSEO PALAZZO REALE GENOVA', 'casa Paganini', 'InfoMus', 'DIBRIS', 'MOJUD', '35 Primocanale', 'COMUNE DI GENOVA', 'teatro dell'archivoltò', 'TEATRO CARLO FELICE GENOVA', and 'GOETHE INSTITUT'. The page has a sidebar with navigation links: Home, About, Posts, Videos, Notes, Photos, Likes, and a 'Create a Page' button. The main content area shows a post from 'L'atlante del gesto\_Genova' dated 23 January at 06:25. The post text describes the project as a collaboration between dance and technology, involving Casa Paganini InfoMus and dancer Virgilio Sieni. It mentions that over 150 people of various ages participated in a collective work to explore the origins of gesture. Below the text is a link to the English version of the project. The right sidebar contains a search bar, a quote about building a gestural vocabulary, the page's category 'Arts/Humanities Website', and an 'About' section with the website 'dance.dibris.unige.it/'. At the bottom right, there is a 'PEOPLE' section with a right arrow.

L'atlante del gesto\_Genova  
@atlantedelgestoGenova

Home  
About  
Posts  
Videos  
Notes  
Photos  
Likes  
Create a Page

Like Share Suggest Edits ... Send Message

Posts

**L'atlante del gesto\_Genova**  
23 January at 06:25 · 🌐

Siete entrati nel diario di bordo di un progetto dove il linguaggio espressivo della danza incontra quello tecnologico e sperimentale di un gruppo di ricercatori universitari (ingegneri informatici). "Dance" è un progetto inserito nel programma H2020 della comunità europea a cui partecipano Casa Paganini InfoMus e tutto lo staff guidato da Antonio Camurri. L'interfaccia espressiva si attiva attraverso la collaborazione con Virgilio Sieni, danzatore e coreografo, che, parallelamente, prosegue il suo percorso artistico con un intervento site specific: L'atlante del gesto\_Genova. Oltre 150 persone di tutte le età dai 10 agli 80anni sono chiamate a partecipare a un lavoro collettivo che vuole risalire alle origini di un archeologia del gesto. Seguitemi.

[English version]  
This is a collection of heterogeneous materials aimed at telling the story of science and art coming closer to learn from each other. Dance is part of the European Framework H2020 and is a project by @Casa Paganini InfoMus and dancer and coreographer Virgilio Sieni. Alongside the academic research, a widely participated project is taking place, involving about 150 common people from Genova (Italy), this is L'atlante del gesto\_Genova. The former is about capturing and mapping gesture.

Arts/Humanities Website

Search for posts on this Page

Si può costruire un vocabolario espressivo del gesto?

Si può riavvicinare e ricomporre una comunità che ha perso il senso della relazione?

InfoMus/Sieni

265 people like this

About See All

🌐 [dance.dibris.unige.it/](http://dance.dibris.unige.it/)

📌 Arts/Humanities Website · Community

📄 Impressum

PEOPLE >

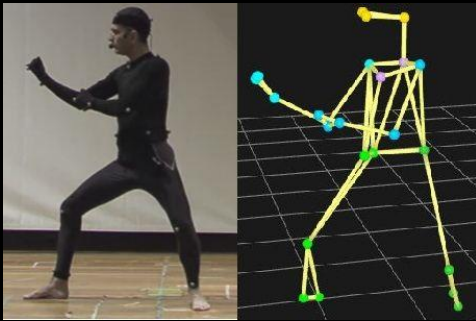
(Facebook page)



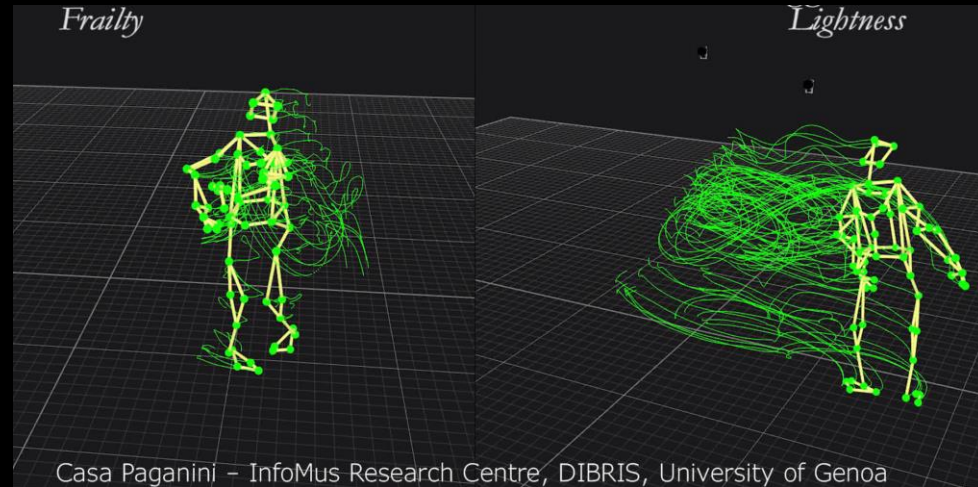
# Analysis of movement qualities

- Techniques to detect whether a movement is rigid, fluid, fragmented, hesitant, impulsive, ...

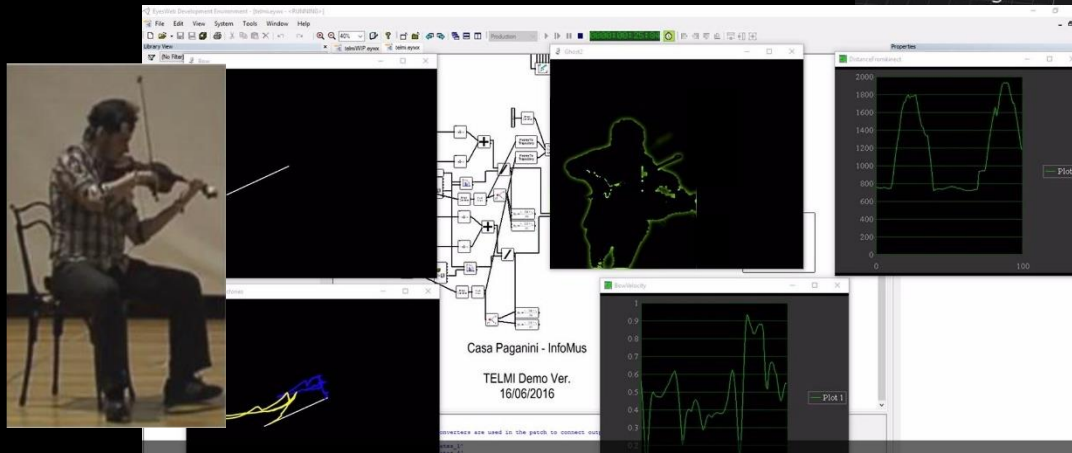
In sport, e.g., martial arts



In dance



In music performance



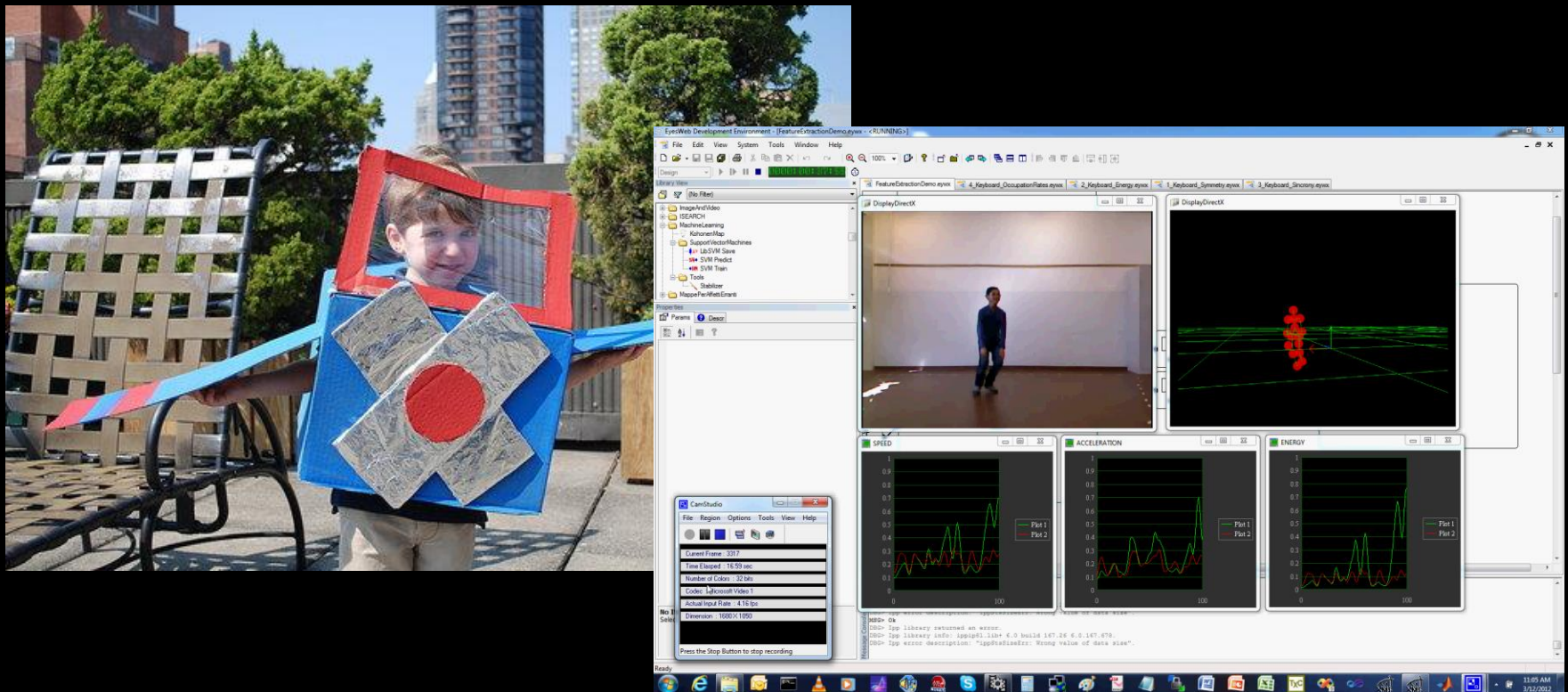
Camurri et al., Proceedings of Intl. Conf. MOCO, 2016

# Real-time multimodal analysis of non-verbal affective and social behavior in ecological environments

- Single user
  - Analysis of expressive qualities of full-body movement and gesture
- Multiple users
  - Analysis of social interaction
  - Temporal and affective entrainment [Phillips-Silver and Keller, 2012].
  - Leadership

# Single user: example

- EU-FP7-FET MIROR: Embodied reflexive systems for music education



G. Varni, G. Volpe, R. Sagoleo, M. Mancini, and G. Lepri, "Interactive reflexive and embodied exploration of sound qualities with BeSound", Proc. 12th Int'l Conf. on Interaction Design and Children (IDC2013), 2013, pp. 531-534.



# Multiple users: example

- EU-FP7-FET SIEMPRE: Synchronization and leadership in music ensembles



D. Glowinski, M. Mancini, R. Cowie, A. Camurri, C. Chiorri, C., and C. Doherty,  
“The movements made by performers in a skilled quartet: a distinctive pattern, and the function  
that it serves”, *Frontiers in Psychology*, vol. 4, 841, 2013.

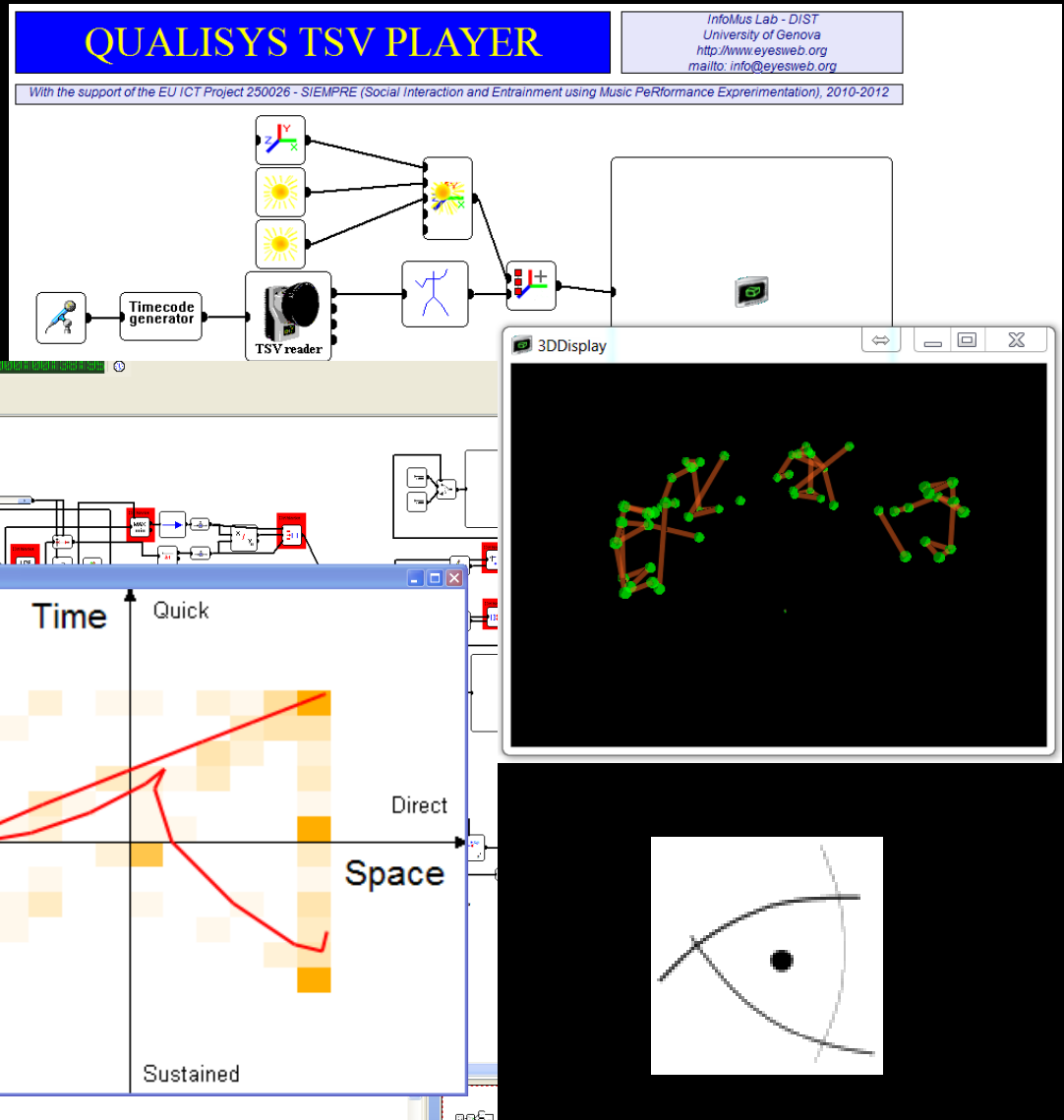
# Technological outputs: EyesWeb

- Platform supporting fine-grain synchronised recordings of multimodal (audio, video, MoCap, biometric) data, performing pre-processing and analysis of multimodal signals in real-time
- Modular, flexible and adaptable
- Widely employed for developing real-time dance, music, and multimedia apps. Adopted by universities, industry, artists, cultural institutions
- Downloadable for free

A. Camurri, S. Hashimoto, M. Ricchetti, R. Trocca, K. Suzuki, and G. Volpe, "EyesWeb – Toward Gesture and Affect Recognition in Interactive Dance and Music Systems." Computer Music Journal, vol. 24, no. 1 pp. 57-69, MIT Press, 2000.

# Technological outputs: EyesWeb

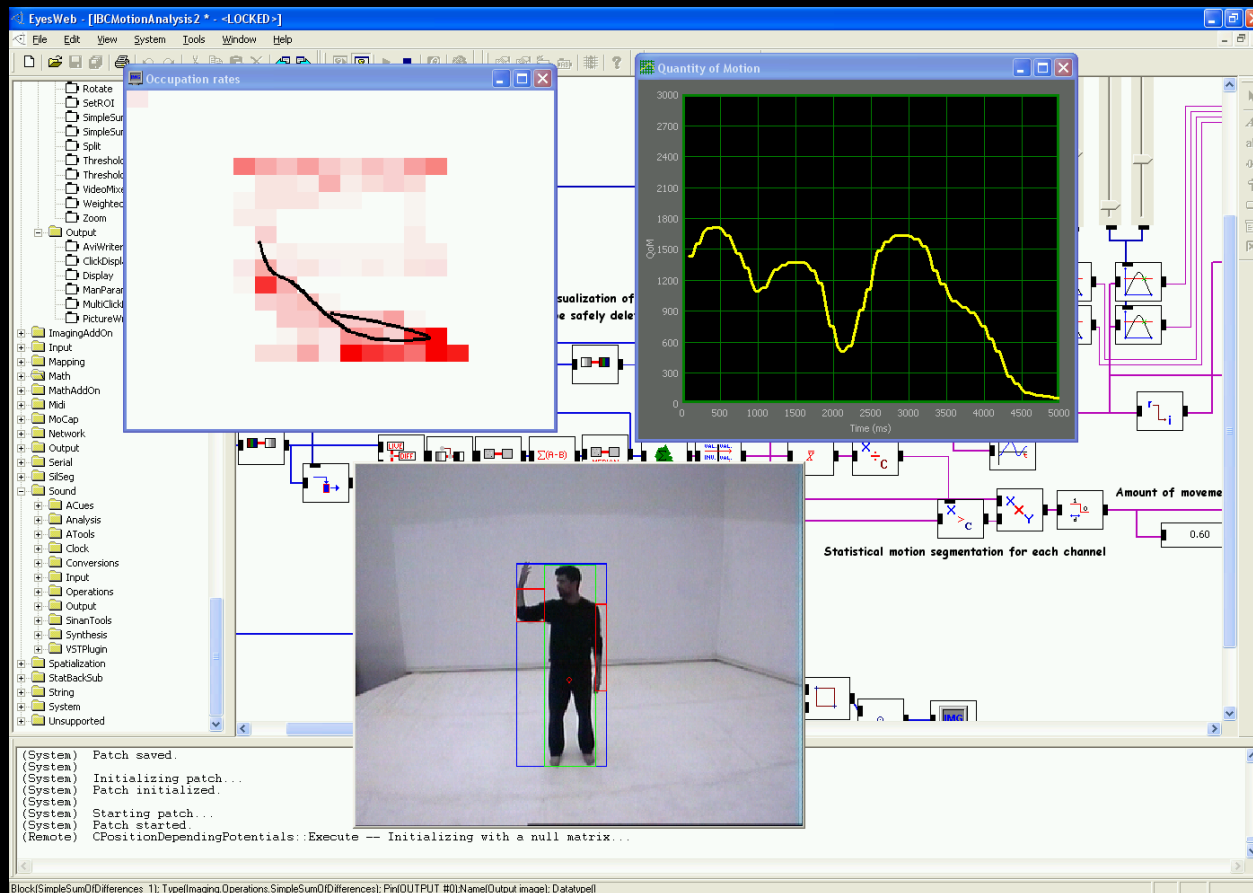
<http://www.infomus.org>





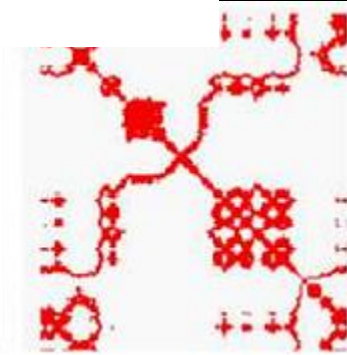
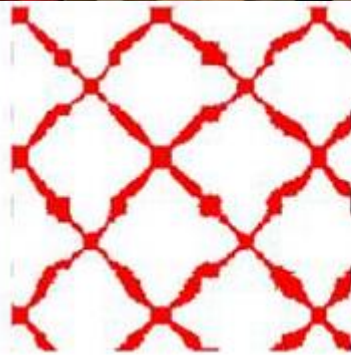
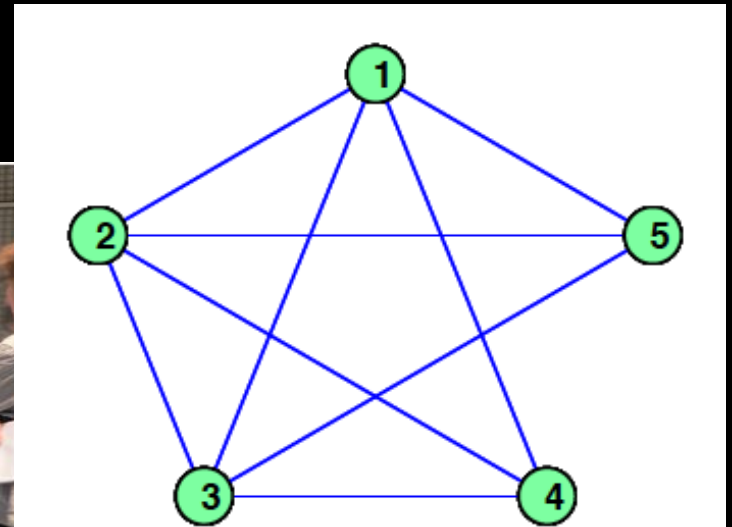
# Technological outputs

Libraries for real-time analysis of body movement: motion features (e.g., kinematics, amount of movement, impulsivity, directness, fluidity, and so on) can be computed, stored on file, and viewed in real-time or off-line



# Technological outputs

Libraries for real-time social signal processing: synchronisation (Recurrence Quantification Analysis, Event Synchronisation), leadership (e.g., chronemic leadership, analysis based on Graph Theory)



# Technological outputs: apps

Systems for: social active experience of music, interactive dance, experience of cultural heritage, rehabilitation, education

iDJ



Sync'n'move



The Orchestra Explorer



Mappe per affetti erranti



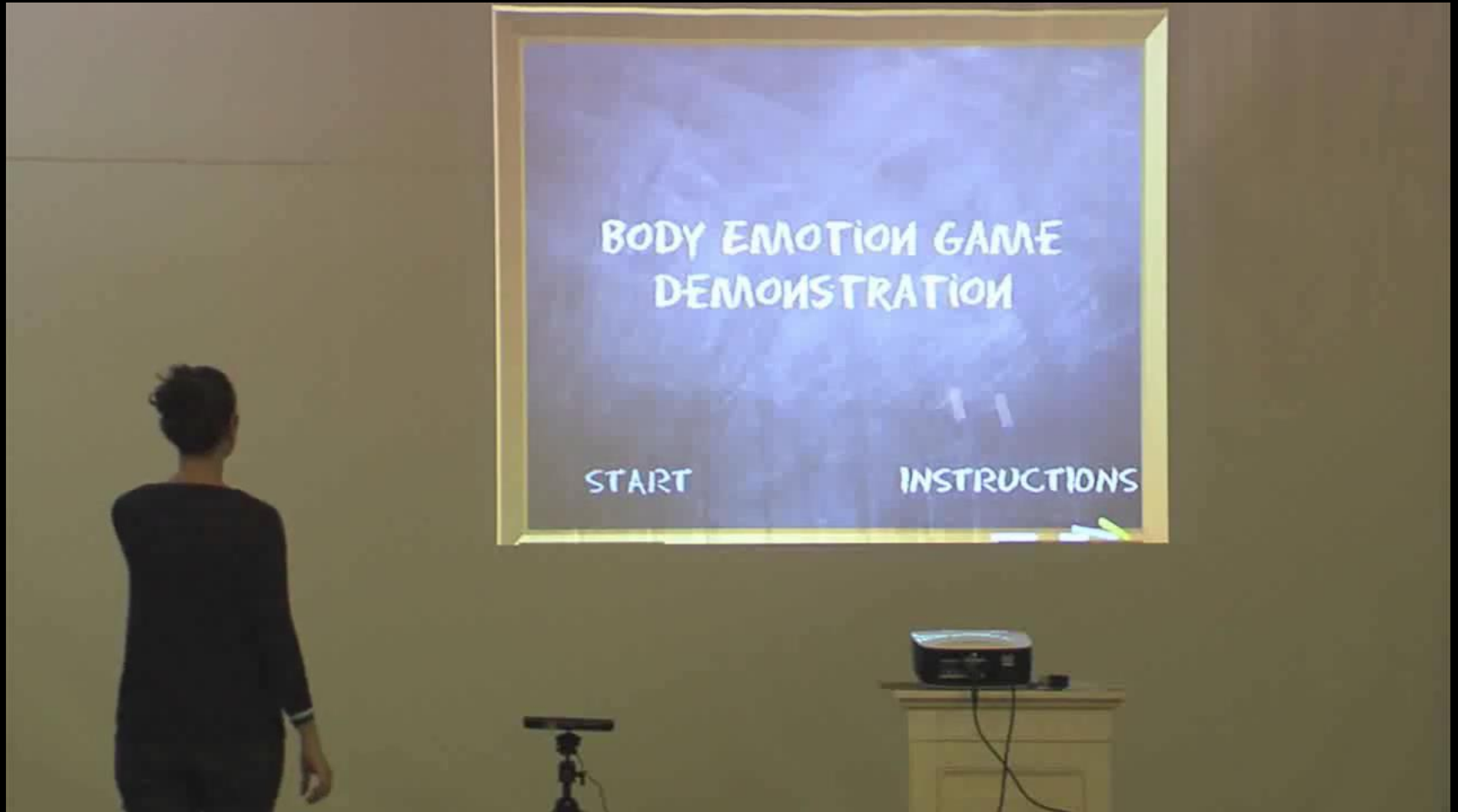
# BeSound: edutainment

*Graphics by  
Compedia*



G. Varni, G. Volpe, R. Sagoleo, M. Mancini, and G. Lepri, "Interactive reflexive and embodied exploration of sound qualities with BeSound", Proc. 12th Int'l Conf. on Interaction Design and Children (IDC2013), 2013, pp. 531-534.

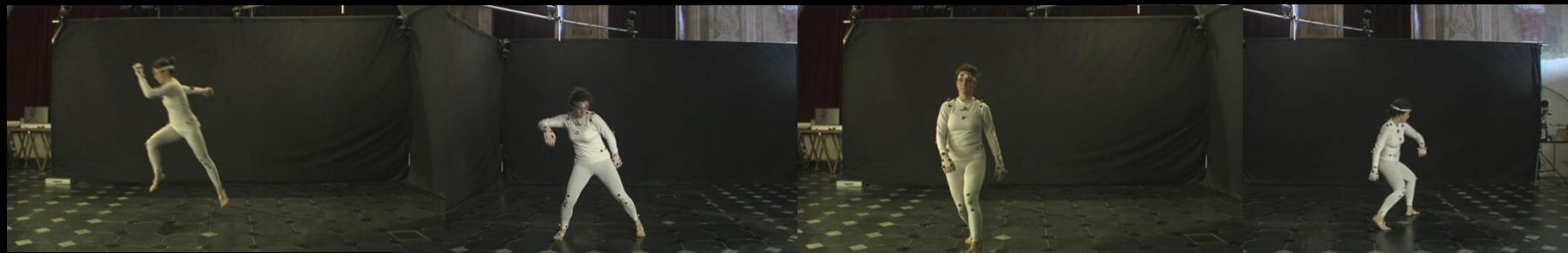
# Games for teaching autistic children to learn emotions



EU-FP7-ICT Project ASC-INCLUSION

# On going projects: EU-H2020-ICT DANCE

- **Main objective:** investigating how sound and music can express, represent, and analyze the affective and relational qualities of body movement. Particular focus on blind people.
- **Current work:** sonification of motion features extracted from sample dance performances



# EU-H2020-ICT WhoLoDance

## Teaching full-body movement

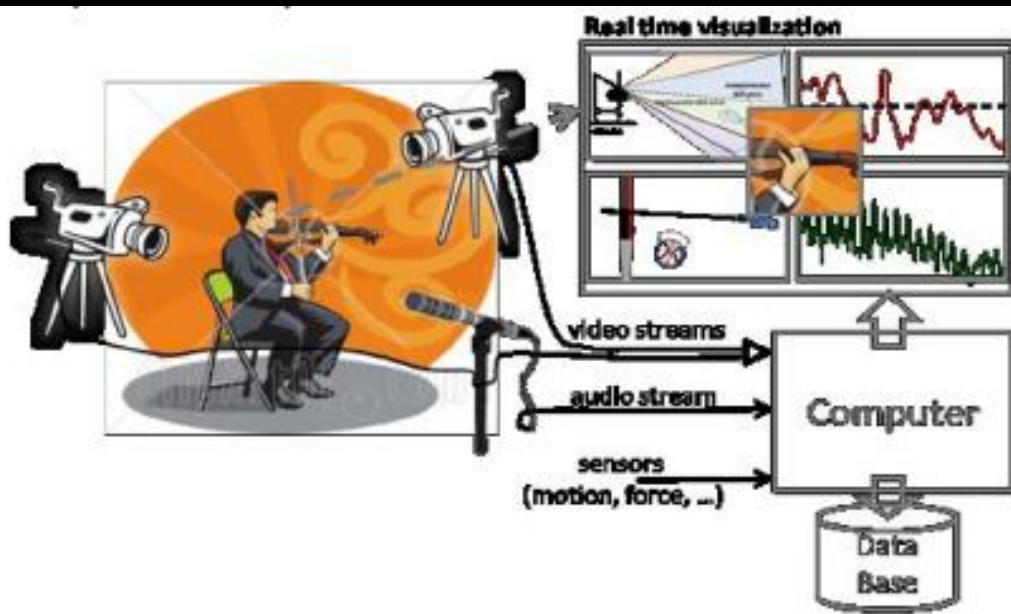
- Real-time analysis of full-body movement and gesture for applications to dance and to teach movement, in sport, rehabilitation etc.





# EU-H2020-ICT TELMI

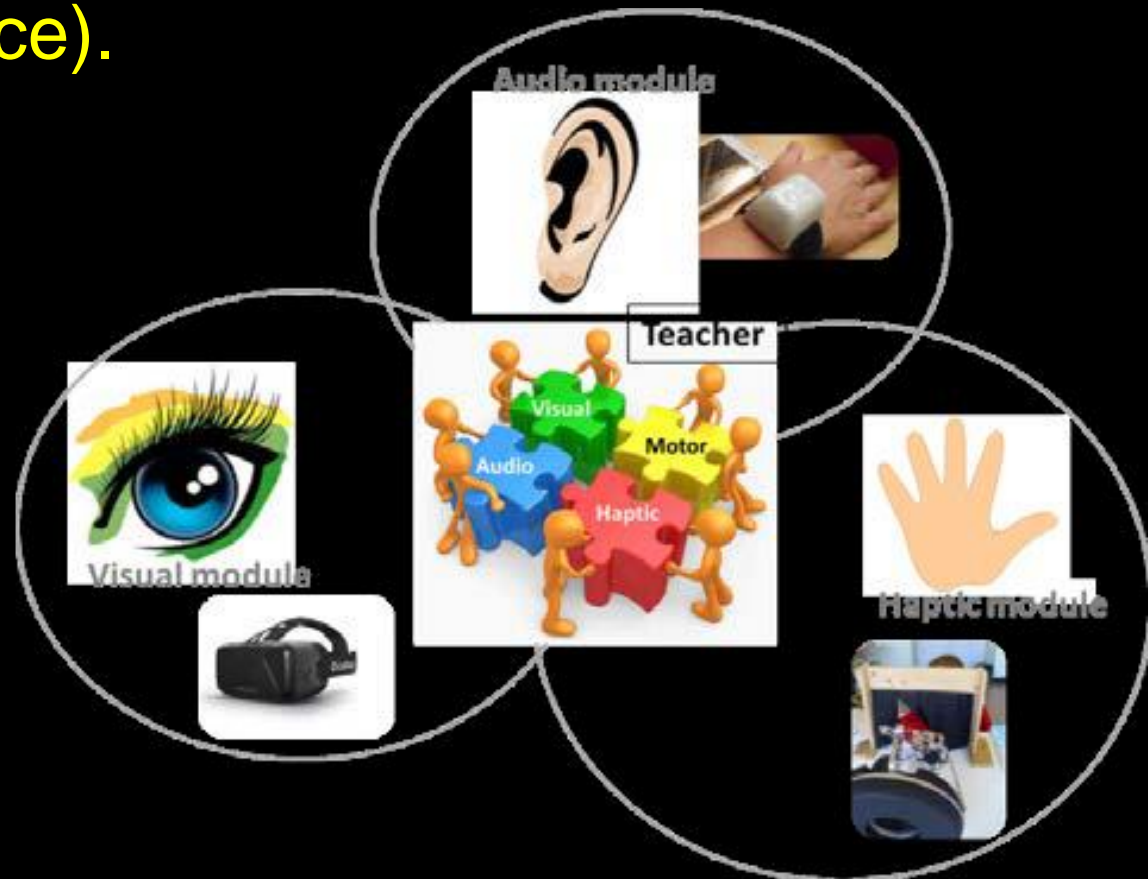
- Analysis of Motion Capture, video, and audio data of violin players for music education.



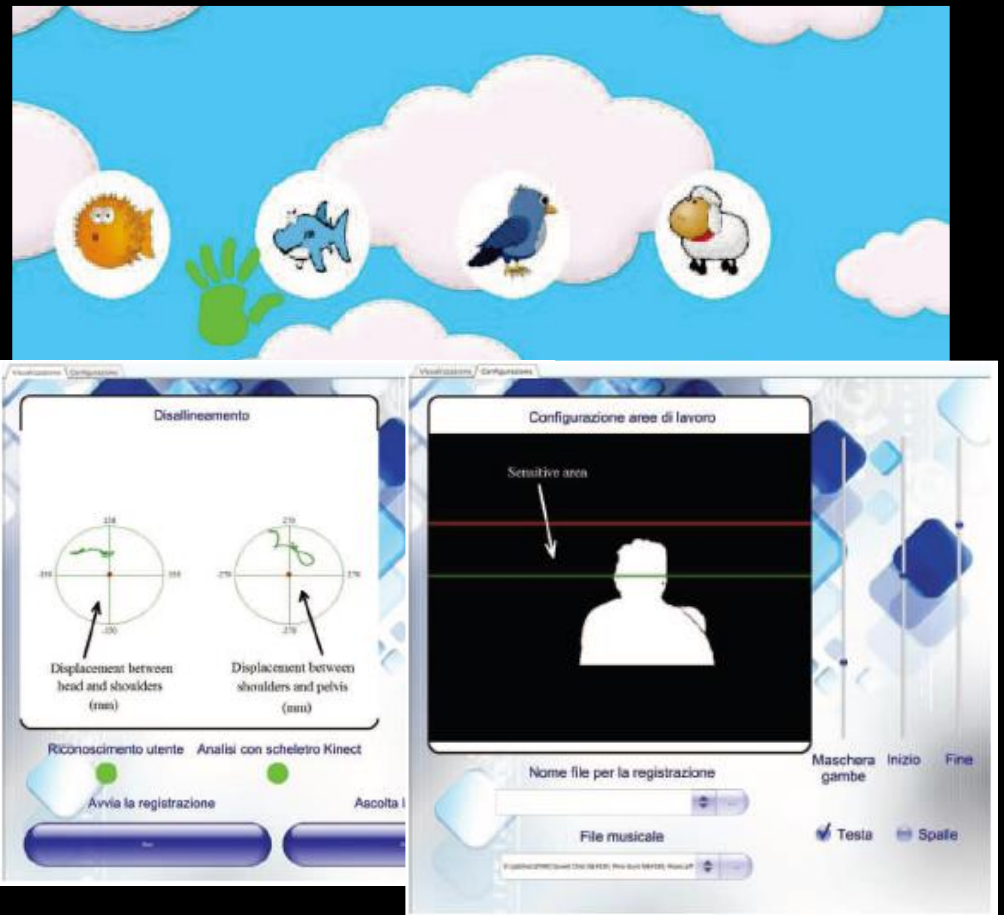
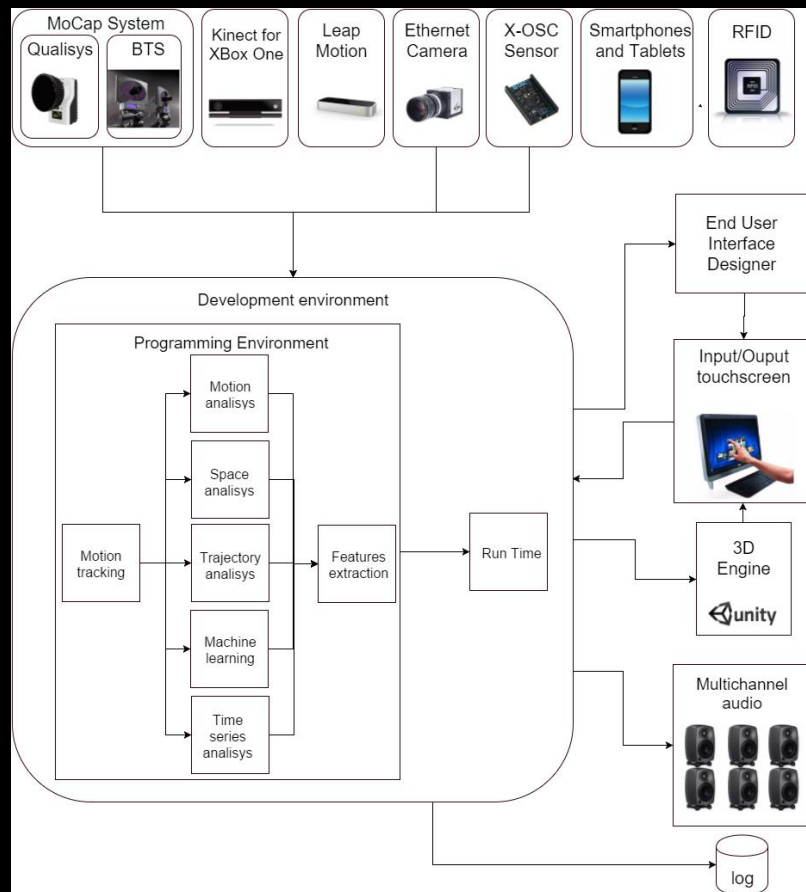
# EU-H2020-ICT WeDraw

- New methodology to teaching and novel technology for deeper learning of numbers (time) and geometry (space).

Serious games  
associating in new ways  
**music with arithmetic**  
and  
**drawing with geometry**



# Joint Lab with Gaslini Children hospital Augmented Rehabilitation Lab (ARIEL) [ariel.unige.it](http://ariel.unige.it)



# Info and contacts

**Videos:** [www.youtube.com/InfoMusLab](http://www.youtube.com/InfoMusLab)

**Web:** [www.casapaganini.org](http://www.casapaganini.org)

*casa/Paganini*. infomus