

LelioSwing: Rediscovering Music Classics while Playing in Duo with Lelio Luttazzi

Marco Rocchetti, Gustavo Marfia

Alma Mater Studiorum - University of Bologna
Bologna, Italy
{marco.rocchetti, gustavo.marfia}@unibo.it

Silvia Colombini, Marco Zanichelli

Open Stories
Bologna, Italy
{silvia, marco}@openstories.it

Abstract—Museums and exhibitions traditionally present pieces of preserved human knowledge in a static manner, letting their public observe and analyze what can be heard or seen. Sight and hearing are hence the two senses, out of the five available ones, that are usually engaged in such scenarios. Recently, information and communication technologies have been put to good use to increase the amount of participation that visitors experience while seeing an exhibition, engaging for example the other senses (taste, smell and touch) in playful ways with modern sensors and actuators, but also serving as building blocks for applications that support novel methodologies of knowledge transfer. In fact, the ephemeral part of human knowledge and experience is the most difficult to capture and, consequently, the hardest to hand down to posterity. Although this remains an open challenge, far from being definitely solved, many steps forward have been made so far. It is hence today possible to go beyond watching or listening, supporting the performance of actions and the construction of new practical experiences while visiting a museum or an exhibition. In this paper we describe practical example of how we implemented such ideas in an interactive system that will be shown in downtown Rome at the Trajan Forum Exposition center. In brief, we constructed an interactive system that lets visitors playing a piano together with the Italian Jazz star Lelio Luttazzi. Visitors, hence, can participate and build their own experience playing with the real artist, rather than solely listening to the artist’s music or watching the artist’s pictures.

Index Terms—Rome, Museo dei Fori Imperiali, LelioSwing, Gestural Interface, Human Computer Interaction.

I. INTRODUCTION

Transformation and dynamism are paradigms upon which many different and successful ventures and applications are built. While this is in general true, both of these aspects become key in highly changing areas like human-computer interaction. In fact, not long ago keyboards were the only mean of interaction between a

human and a computer, now computers are capable of detecting a user’s position, movements and even a user’s mood. Future steps could entail foreseeing a person’s actions or behaviors, as for example the authors of a popular TV series recently envisioned [1]. In essence, humans and computers are getting to interact in progressively more complex and intuitive ways every time new technological advancements in the area of Human Computer Interaction (HCI) are made.

Now, while it is commonly accepted that technological advancements can potentially have an impact on all aspects of human life, some of these aspects can appear far and difficult to change. Other aspects may, instead, suddenly be revolutionized, in ways that were not imaginable before the appearance of given technologies. Consider as an example the 2012 rap concert in Coachella [2].

In such occasion many of the best rappers of the world (Dr. Dre, Eminem, 50 Cent, Wiz Khalifa, Kendrick Lamar, Tony Yayo, among others), gathered and performed in front of a public of thousands of fans. With great surprise of this incredible audience, Tupac Shakur also appeared among the performers, singing in a duo with Snoop Dog. This event would not appear strange at all (Tupac is considered among the best performers in the history of rap) if Tupac did not pass away in 1996, shot by a gang member.

Clearly, the technological advancements that have been produced by humanity are far from being capable of resurrecting a human being, but Tupac has indeed been seen by thousands of people back on stage after his death. Rather than a miracle, what happened was that projection technologies got to a level of advancement that it was possible to project a digital representation of Tupac, just as if he were on stage.

Now, HCI technologies have advanced to a point where they can not only support the interactions between human beings and computers, but also extend the interactions that can occur between human beings and reality. Hence, it is today possible to “resurrect” and talk to someone who lived in the past, as well as interact with imaginary and far worlds. All this is clearly of incredible interest for museums and

exhibitions for two different reasons. The first immediate one is that it is possible to build new bridges of understanding that also require active interaction.

A visitor becomes an active subject, rather than being confined in a passive position of observation or hearing (e.g., an exhibition produces different outcomes depending on given input commands). The second and deeper one is that becoming an active subject a visitor can also become a participant, an actor that lives and, potentially, also creates new forms of ephemeral knowledge (e.g., Snoop Dog created a novel piece of musical art performing in a duo with a digital projection of Tupac).

This said, a very interesting opportunity of building a new interface between the present and the past came with the invitation to create a performance for the LelioSwing exhibition.

Taking one step back, Lelio Luttazzi has been one of the main Italian jazz performers and TV characters in the '60s and '70s [3, 4]. After his death in 2010 his widow, Mrs. Rossana Luttazzi, created the Lelio Luttazzi Foundation aiming at keeping alive her husband's art and memory. For this reason, beginning in November 2013, the LelioSwing exhibition will be held at the Trajan Forum Exposition center, right at the heart of Rome.

Now, the LelioSwing application is based on a gestural interface and on a projection where Lelio's videos are shown. The gestural interface, based on vision algorithms, interprets the gestures a given user performs, supporting: (a) the selection of the video the user wants to play, and, (b) the play of a projected piano.

In (b) resides the novelty of the LelioSwing application: LelioSwing lets a user play a musical instrument (i.e., a piano) together with Lelio Luttazzi. Hence, just as Snoop Dog did playing a duo with Tupac, LelioSwing lets its users play a duo with Lelio. One important difference between the two performances, however, is that in Coachella, among all the people that were there, only Snoop Dog had the opportunity of playing with Tupac, while in Rome every visitor will have the possibility of playing with Lelio. Factually, this will happen as follows. Simply moving his/her hands a user can select the video s/he wants to watch on the projection area.

This video, projected in front of the user, is displayed below a projected representation of a piano (i.e., an octave of a piano). Hence, as the video plays, the given user can also perform playing the virtual piano.

To the best of our knowledge, LelioSwing is one of the first examples where an ephemeral experience with the past (i.e., a user playing with a deceased musician) is supported. When using LelioSwing a user becomes an active player, building a bond with Lelio Luttazzi's music and rhythm which is embraced not only while listening, but also, and more deeply, while playing.

The rest of this paper is organized as follows. In the next Section we list a few of the works fall closest in scope to LelioSwing, while in Section III we will present LelioSwing's interface. We conclude with Section IV.

II. RELATED WORK

Technology is slowly, but pervasively, penetrating all aspects of human knowledge, including knowledge preservation and presentation institutions like museums and exhibitions. In the following we list a few of the applications that, based on information and communication technologies, fall closest to LelioSwing.

Artist's View is an iPad app that has been realized for the "Americans in Florence. Sargent and the American Impressionists" exhibition held in Palazzo Strozzi in Florence [5]. The peculiarity of Artists' View is that, by means of augmented reality technologies, it is today possible to see what the artists who painted Florence at the end of the 19th century saw.

Clearly, Florence has changed in many ways in over a century, but Artist's View helps finding the perspective that the eyes of seven artists had in the past. Once a user finds the exact point at which the artist painted the work, Artist's View superimposes the painting over the live image on the iPad's screen, which allows the viewer to see what still remains, what has changed and what has disappeared forever.

Tortellino XPerience is an public performance that has been exhibited at the Shanghai World Expo in 2010. With this performance a user was step-by-step led to prepare a handful of Tortellini Pasta in a virtual world. In fact, as LelioSwing, Tortellino XPerience is based on the use of a video camera and a projector.

Hence, at every step a user first watched a video that showed what actions were necessary to complete that given step (e.g., roll the dough). The step then continued letting the user repeat the same actions, moving his/her hands in the air while watching their digital representation on the projected screen in front of him/her. In fact, during each step a video camera placed on top of the area would capture a real-time video of the user.

With the aid of a set of software algorithms, the system was capable of extracting the movements that the user performed from the given real-time video stream. Finally, an algorithm checked whether the actions that were performed were correct or not. In the latter case, the user was asked to repeat the set of required actions in order to be able to proceed to the next step.

The mentioned systems have been built to bridge their users with the past. Artist's View seeks to ignite an understanding of why a given view inspired a given artists, guiding its users to the locations where those artists were struck for the first time. Tortellino XPerience leads its users through the traditions of Italian cuisine, leaving the flavor of the care and the meticulous preparation that a dish requires.

Both systems use today's traces of the past to lead to a deeper understanding of lost emotions, of traditional skills, of types of information that remain today extremely hard to store and preserve [5].

LelioSwing moves one step further ahead in this given direction. In fact, it combines elements of Artist's View (i.e., get close to the artist's perspective) with elements of Tortellino XPerience (i.e., experience tortellini-making doing tortellini). Hence, with LelioSwing it is possible to approach Lelio Luttazzi's perspective, walking through the notes that the plays, playing with him, in an unthinkable duo.



Figure 1. Storyboard of the LelioSwing application: how it will appear at the Trajan Forum exposition.

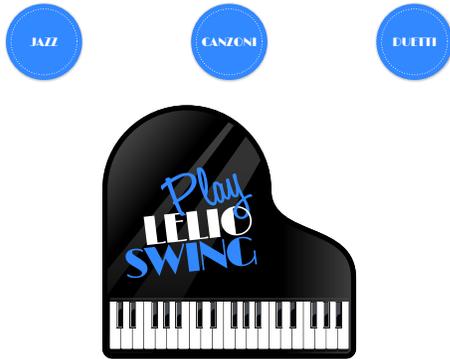


Figure 2. First part of LelioSwing: choosing the music genre.



Figure 3. Second part of LelioSwing: choosing the performance.



Figure 4. Third part of LelioSwing: performing with Lelio.

III. LELIOSWING

We here briefly describe how LelioSwing will work. In Figure 1 we see how LelioSwing will appear to the public, a user will be interacting with gestures with a video projection in front of him/her. The application, in particular, is divided in three parts.

In the first part of LelioSwing, a user can choose the music genre s/he wants to play (Figure 2). This is simply performed touching one of the three buttons that are shown at the top of the projection.

For example, touching the top left button “jazz”, one will be able to reach all the jazz performances that are available in the system.

In the second part of the application (Figure 3), a user can now choose the specific performance of interest.

This is performed using the same mechanism that was employed at the previous step: touching a given button it is possible to reach the associated performance.

Hence, when touching the top left button in Figure 3, it will be possible to watch and interact with Lelio Luttazzi’s and Lionel Hampton’s performance.

In the final and third part of the LelioSwing application it is at last possible to play together with Lelio. This can happen as simply as shown in Figure 4, just touching the keyboard at the top it is possible to play a virtual piano following Lelio’s swing and rhythm.

IV. CONCLUSION

We have here described the LelioSwing application, application that will be displayed at the Trajan Forum Exposition center in the heart of Rome from 7th November 2013 to 2nd February 2014. There is plenty of scientific and entertainment literature that has been of technical inspiration for this multimedia live application [6-20].

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