SIEMPRE

D5.3 – Start-up Workshop

Version	*Edited by*	
V0.9	Maurizio Mancini, Donald Glowinski, and Antonio Camurri	Document preparation
V1	Miguel Ortiz, Antonio Camurri, Gualtiero Volpe	Final version

TABLE OF CONTENTS

Introduction 3
Seminar: “Musica, Empatia e Neuroscienze” 3
E-Motion 4
Dual – Shadow Awareness II 5
  Dance performance version 5
    Required space and equipment 9
  Experience version 10
Virtual Shadow Puppet II 11
TwinkleBall 12
Pekoppa 13
Performing Sound 13
Seminar: “Emozioni d’ombra” 13

Introduction

The First SIEMPRE Workshop was organized as a series of public events included in the Festival of Science 2010 (www.festivalscienza.it). These public events were held at Casa Paganini Auditorium and at Palazzo della Borsa in Genoa, and included two seminars, three dance performances and three booths/scientific exhibits, and a scientific experiment involving visitors of the Festival as measured subjects.

All partners in the consortium participated to the Workshop. Besides, a group of about 30 researchers from Japan (Waseda and other Universities), directed by Professors Hashimoto, Miwa, Nishi, and Watanabe actively participated and organized a series of public performances with dance and interactive technology on “shadow media”, which were among the most attracting events at the Festival.

The workshop had several objectives:

- To discuss among partners and with external experts (Professors Hashimoto, Miwa, Nishi, and Watanabe) the scientific requirements for research in SIEMPRE;
- To start-up the experimental work in the project with some preliminary experiments, by taking benefit of the availability of a large audience (the E-Motion laboratory)
- To start co-operation with relevant institutions outside EU (the joints event with researchers from Japans)
- To start disseminating the project and its objectives to a large audience including both scientists and researchers and the general public (the seminars and the participation in the Festival of Science).

All the events of this first SIEMPRE Workshop, shortly described in this deliverable, were widely advertised by the Festival of Science by their web site (www.festivalscienza.it, see each event page) and on newspapers and conference press. Many hundreds of people visiting the Festival attended all the Workshop events.

Seminar: Musica, Empatia e Neuroscienze (Music, Empathy, and Neurosciences)

L. Fadiga (IIT, Istituto Italiano di Tecnologia), A. Camurri (InfoMus-Casa Paganini), B. Knapp and M.Ortiz (Queen's University, Belfast).

This event presented to a broad audience of about 230 people, participants to the Festival of Science 2010, the EU ICT FET Project SIEMPRE. In particular, the seminar included a lecture by Luciano Fadiga on "Music, empathy and neurosciences" and a presentation of the the "E-Motion" lab experiment (performed by QUB at Casa Paganini during Festival of Science, and described in detail in the next section).

Music, language and action show important similarities. Indeed, they do not only depend on the same neural substrates but they also have similar syntactical and structural properties. These similarities could depend on the fact that the frontal area of brain involved in discourse production (Broca's area) is also involved in music listening and execution. Mirror neurons, that activate when we execute and observe a similar action, could provide the ideal physiological substrate for implicit and explicit non-mediated communication. Through the analysis of some experiments conducted to investigate the unknown mechanisms of communicative relationship between conductor and orchestra, Luciano Fadiga, neuroscientist who discovered together with Rizzolatti and other collegues the mirror neurons, discussed the current most significant and evocative neurophysiological research hypothesis connected to the phenomenons of empathy and nonverbal communication.

E-Motion - Un Laboratorio-Esperimento a Casa Paganini /A Laboratory-Experiment at Casa Paganini

B. Knapp, M. Ortiz, N. Coghlan, J. Jaimovich.

Sonic Arts Research Centre, School of Music and Sonic Arts Queen's University Belfast.

What makes a happy song? Does your body love the music you hate?
Under these simple questions, the E-Motion lab experiment aims at establishing relationships between self-report assessments of users listening to music and their physiological responses.
Music has been an intrinsic part of the human experience throughout our history yet we still only have a vague understanding of what its 'purpose' might be in evolutionary terms. It seems to have the power to move us and to modify our moods, yet little is known about the mechanisms by which this might be achieved. The 'E-Motion' study aims to identify factors involved in emotional responses to music through the participation of visitors to the Festivale de la Scienza.

E-Motion comprises a computer-based experiment examining emotional responses during music listening. Participants were seated in front of a terminal running the experiment software (Fig. 1), developed by the Music, Sensors & Emotion (MuSE) research team at SARC, and asked to put on a pair of headphones and 2 sensors on their fingers.

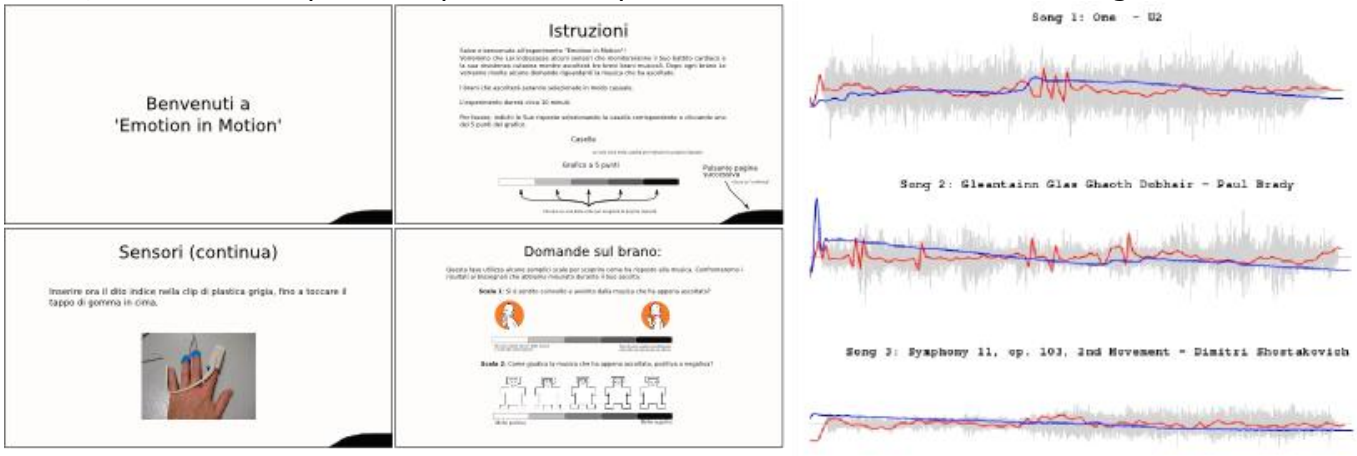

Figure 1. E-Motion Software

Easily fitted on-body sensors were used to measure select physiological correlates of emotional state and changes in emotional state (Heart Rate and Galvanic Skin Response).

After answering some brief questions about their background and musical experience they listened to 3 randomly chosen excerpts from a pool of music pieces, with samples ranging from classical to death metal to traditional folk and pop. After each excerpt they were asked a few questions about the excerpt using a combination of validated psychometric tools, such as the Self Assessment Mannekin *(Bradley, Lang, 1994)*, the LEMtool *(Huisman, Van Hout 2007)* and tools specific to music and emotion, such as the Geneva Emotional Music Scale GEMS *(Zentner, Grandjean, Scherer 2008)*. After listening to all 3 excerpts the participants were then asked to rate which they found most pleasurable and which they found most engaging. At this point participants were able to choose to see an on-screen representation of their data and to have images of their physiological signals emailed to them (see Fig. 2 below). The entire experiment took roughly 15 minutes or less to complete for each participant. The data gathered from this experiment will contribute to on-going research by the MuSE research cluster at the Sonic Art Research Centre (SARC), Queens University Belfast.

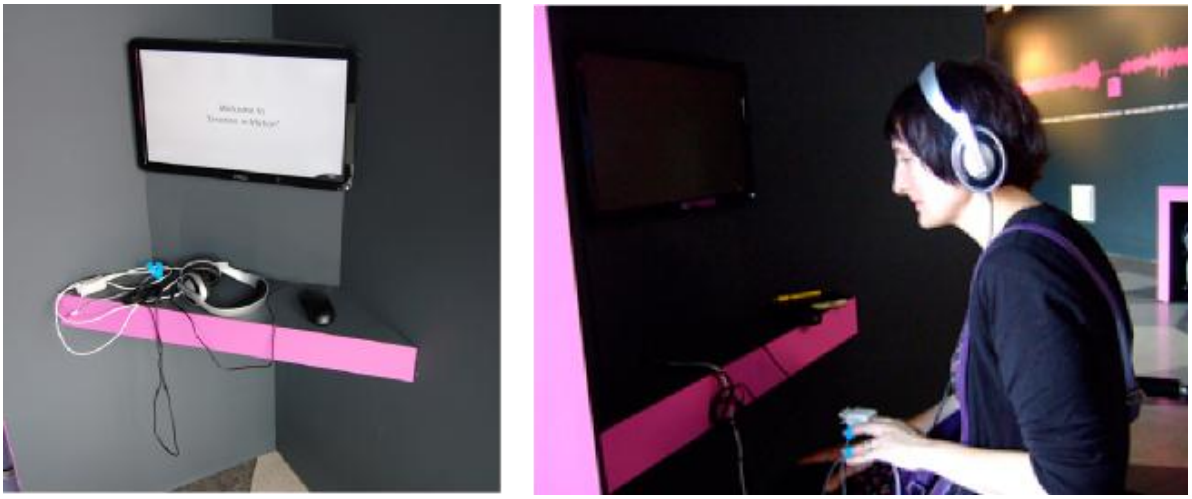

Figure 2. E-Motion at Science Gallery Dublin

The experiment has previously been featured as part of a similar exhibition at the Science Gallery in Dublin, Ireland and received an overwhelming response from the public, generating over 12000 individual samples of physiological and self report data. For the running of the experiment in Genova, we translated the software slides into Italian and had 67 participants.

Dual – Shadow Awareness II

Y. Miwa, S. Hashimoto, S. Itai, T. Yamaguchi, T. Watanabe, H. Nishi

Miwa Laboratory, Department of Modern Mechanical Engineering, School of Creative Science and Engineering, Waseda University

Hashimoto Laboratory, Department of Applied Physics, School of Advanced Science and Engineering, Waseda University

Dance performance version

At this dance performance by improvised bodily expression, a dual domain interaction (conscious and unconscious interaction) between dancers and audiences is displayed on the stage (Ba[1]) that the shadow media creates. Furthermore, this shadow media create the stage where current people encounter past people beyond the limit of time and space. In other words, shadow that is inseparably related to the self is transformed to create a dual gap between the self and shadow, so that awareness can be generated inside the self, resulting in promoting the self-creation of the expression (Fig.1).

Figure 1. Creation of bodily expression by various shadow media

Moreover, by projecting these transformed shadow onto the slit-pattern transparent–type screen (which is unprecedented invention in the world), image creation by shadow can be widen due to a perceptive interpolation function caused by slits (Fig.2).

[1]Note: Ba is one of Japanese key cultural concepts. Ba is defined as a type of space not just a physical space, but a space (stage) on which each performer (dancer) positions his existence.

Figure 2. Shadow media projected onto the slit-pattern transparent-type screen (Small size prototype)

From the above, at the dance performance with people in the past via a shadow media, expression can be continuously self-created while people at present is comprehending the past people's emotion and context of the past people's expression through the people's shadow in past (Fig.3).

Figure 3. An example of archive in case of dual residual shadow usage

Furthermore, by projecting shadow media onto the transparent–type screen like a scrim, the dancers can create their expression through their shadow media while they faces audiences and are united with audiences (Fig.4).

Similarly, audiences can also variously image and position what is happening on the stage through dancer's shadow.

Figure 4. View of the slit-pattern transparent-type screen (Small size prototype) from dancer's side

At the theatre-type stage space where dancers and audiences are integrated by the shadow media as has been described in the above, the dance performance having an eastern concept "A predecessor plants a tree, a successor will relax under the tree" is developed. This phrase implies that life of each people in different times can be connected through the nature. This work intends to express this concept on the stage by deformation technique for making tree-like player's shadow, "creative interface of "Ba" and archive technique" by which these aspect changes are connected temporally as well as synchronously. Moreover, handicapped children are also participating to this performance as the dancer, indicating that shadow is effective as an inclusive expression.

Furthermore, at this dance performance, the performer expresses own body as a shadow and sound. The performer who has TwinkleBall (See Fig.5) can become a conductor as the sound is generated by the performer's dance. The performer can pass Twinkleball to different performers by throwing or by hand. Moreover, two or more Twinkleballs work at the same time. Thus Twinkleballs realize a performing interaction between dancers by co-generating sound and/or owning them jointly to emphasize the shadow interaction. The shadow system makes a vivid image of body motions while Twinkleball creates sound output, which prepares a field for co-creation tempting performers into a new horizon of expression.

Figure 5. Appearances of the musical performance using TwinkleBall

Required space and equipment

The shadow system (WSCS-IV) that can realize the aforementioned dance performance is organized with slit-type transparent screen (4m height, 10m width), a thermo-camera to grab human image, and a projector to display shadow images that are created by PC. As seen in Fig. 6, the slit-type transparent screen is placed at the center portion between the stage (10m width, 8m depth) and the audience seats, and shadow media is projected by two projectors from the audience side.

Additionally, the thermo-camera for obtaining human image is installed at the back portion of the stage.

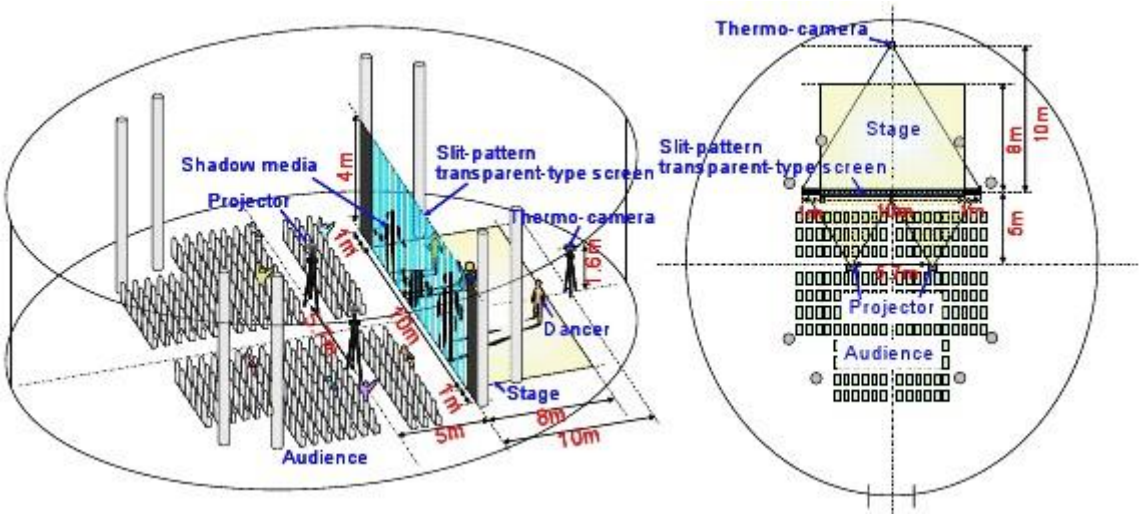

Figure 6. Overview of the dance performance utilizing WSCS IV in the Palazzo della Borsa

User experience version

Shadow Awareness II is a work designed for creating impromptu expression or playing with other people through by opening the shadow media system using for the dance performance to the public and by using shadow of deformed your self on the slit screen or shadow of the people in the past.

As show in Fig. 7, the basic equipment and set-up are the same as for the dance performance program. Moreover, the required space is also same space as that required for the dance performance (see Fig. 7).

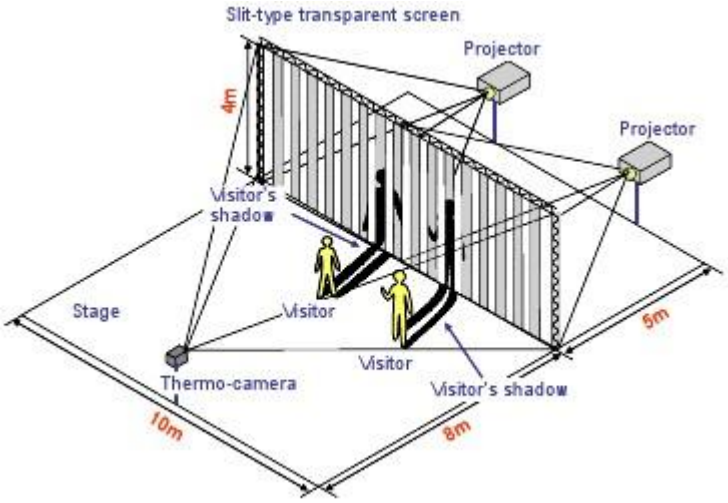

Figure 7. Fig. 7 Schematic view of Shadow Awareness II in the Experience-Type Demonstration

Virtual Shadow Puppet II

Y. Miwa, S. Hashimoto, S. Itai, T. Yamaguchi, T. Watanabe, H. Nishi

Miwa Laboratory, Department of Modern Mechanical Engineering, School of Creative Science and Engineering, Waseda University

Hashimoto Laboratory, Department of Applied Physics, School of Advanced Science and Engineering, Waseda University

Virtual Shadow Puppet II is a work in which participants can play with shadow pictures of ethnic characters (such as Pinocchio or Wayang Kulit etc.) via their own body shadows. By doing this, participants can create improvised expression while feeling cultural background associated with these characters through their body (see Fig. 8).

Figure 8. Virtual Shadow Puppet II

Because dolls of shadow pictures move each joints by physical simulations, once the visitors moves his body, they can create redundant and complicate movements just like the doll does. At this moment, since his own shadow is displayed as if it is connected partially to the shadow puppet, the visitor can feel and enjoy the complicated movements through his body. Furthermore, by changing the gravity of the physical simulation, he can sense unexperienced and mysterious movements.

This experience is performed using the same space for the Shadow Awareness II at the different time span. However, as seen in attached Fig.9, for Virtual Shadow Puppet program, we have several tripods for motion capture camera.

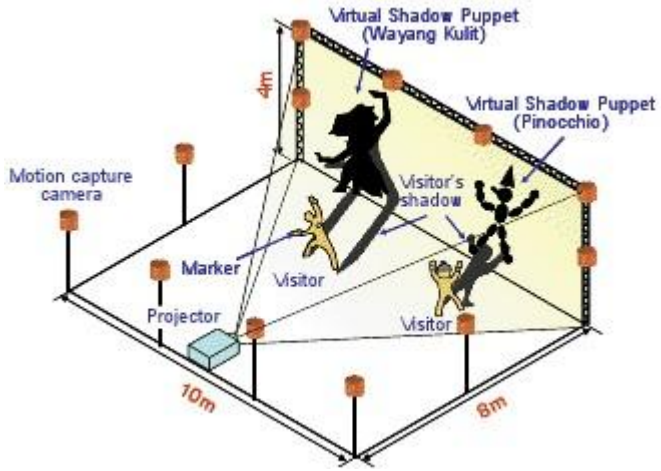

Figure 9. Schematic view of Virtual Shadow Puppet II in the Experience-Type Demonstration

The present system can sense and detect positions of heads and hands using motion-capture which are installed at surroundings of the space. Visitors are required to attach markers for motion capture on their heads and hands. Then, the thus obtained information on body positions creates CG of virtual shadow puppet by PC. The created shadow puppet is then projected onto the screen from the back side.

TwinkleBall

Y. Miwa, S. Hashimoto, S. Itai, T. Yamaguchi, T. Watanabe, H. Nishi

Miwa Laboratory, Department of Modern Mechanical Engineering, School of Creative Science and Engineering, Waseda University

Hashimoto Laboratory, Department of Applied Physics, School of Advanced Science and Engineering, Waseda University

TwinkleBall is a ball-shaped interface for embodied sound media. The sound is generated by grasping force and human motion. The mechanism of TwinkleBall is as follows: 1) a photo sensor is embedded in the translucent rubber ball to detect the grasping force which is translated into the luminance intensity for processing, 2) an accelerometer is also embedded in the interface for motion sensing. By using these sensors, performer can control the note and tempo by varying grasping force and motion respectively. The features of TwinkleBall are luminous, ball-shaped, wireless, and handheld size. As a result, TwinkleBall is able to generate the sound from the body expression and achieve the free-style performance such as dance.

Pekoppa

T. Watanabe, R. Danbara, M. Jindai
Faculty of Computer Science and System Engineering,
Okayama Prefectural University, Japan

A miniature garden that ears and silently nods interacting with to human speech. These small plants looking like flowers (daisy, sunflower) react to the user vocal input by producing several actions and movements, similar to head nods and body movements.

The system, which is the core of Japanese toys Pekoppa and Hanappa, uses a material called BioMetal that behaves like an artificial muscle. When the material is warmed up or electricity runs across it, instantaneously contracts by 5% and when electricity is interrupted it gets back to its original state.

Performing Sound

S. Hashimoto, Ti Yamaguchi, Y. Sugawara
Faculty of Science and Engineering, Waseda University, Tokyo, Japan

This system allows one to perform interactive improvisation between humans and computers. The machine does not only answer to the user performance but, instead, it interacts with the user in the performance creation. Computer and human performer can in turn be the solist, or they could together create a virtual "jam session".

Let us play music with such system!

Seminar: Emozioni d'ombra (Emotions of Shadow)

Y. Miwa, S. Hashimoto, T. Watanabe.

Chair: A. Camurri

Even if shadows can be considered only as a product of optical phenomenon, there will always be something missing in their aspect, wrote Gombrich in a fashinating book published in 1995 to trace the story of shadow representation in Western Arts (from the

experiments of Masaccio and Gauguin, who affirmed that if instead of using the human figure only the shadow was considered then a new original starting point for painting could be discovered).

The appearence of shadow, the body projecting itself, the freedom of a changing and expanding image, enable us to feel our position in the space but also to give a signification to our position in the environment. Children experience and play with shadows, being fascinated by them and discovering their expressive potential. But today, by means of new technologies, it is possible to reinvent all of these shadow games and trasform them into astonishing **artificial shadow media**, **places where we can understand the link between ourselves and space, tools to create an emotional and affective links between people**.

At the end of the final performance-event of the CREST project, funded by the Japanese Department of Industry and presented for the first time in Europe at the Festival della Scienza 2010, Hashimoto, Watanabe, Nishi and Miwa, professors of the Waseda University of Tokyo, explained the results of their research work in the field of shadow media as a novel paradigm for human communication and expression.

The seminar, proposing the most stimulating modalities to link scientific research with artistic experimentation, technological imaginarium with emotional relationships, Western research paradigms and Eastern conceptual models, has been chaired by Antonio Camurri, coordinator of the research centre of excellence Casa Paganini.