

# SIEMPRE

Social Interaction and Entrainment using Music PeRformance

# SIEMPRE

## Deliverable D5.1: Project Web Portal

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# 1. INTRODUCTION

The SIEMPRE web portal has been developed at the beginning of the project in order to support researchers to share documents and data, and to disseminate results and events outside the Consortium.

The first version of the portal has been published (publicly available) at beginning of July 2010. It can be accessed since July 2010 at the following addresses:

[www.infomus.org/siempre](http://www.infomus.org/siempre)

[www.casapaganini.org/siempre](http://www.casapaganini.org/siempre)

The SIEMPRE web portal has been designed to support mainly the following users: (i) the community of researchers involved in the SIEMPRE project (e.g. to share documents, scientific data and software in a safe and effective way); (ii) the wider community of external researchers, who are informed on scientific outputs, public events related to the SIEMPRE Project, can access and download papers and other public documentation, can link to the project archives of multimodal recordings, etc; (iii) to inform ICT practitioners and researchers from other fields about the results of SIEMPRE.

In this deliverable, we present the current version of the web portal and the technical solutions we implemented to satisfy (i) user requirements for both the above mentioned communities, and (ii) the features required by the project as in the project technical annex (Table1.1).

<p>An internet web portal will be developed at the beginning of the project. In will include an area with description of research results and links to publications, an area for the SIEMPRE Repository, including algorithms and techniques with possibility of downloading material (e.g. software modules for feature extraction, software modules implementing the developed computational models), an area for accessing the data included in the SIEMPRE Database.</p> <p>The portal will also include news section for announcing relevant events (e.g., the SIEMPRE Workshops and public events).</p> <p>Beside dissemination the web portal will also be employed by the partners in the Consortium for internal communication purposes, e.g., brainstorming, discussion, exchange of materials, and coordination of activities.</p> <p>Expected results: development and maintenance of the project web portal.</p>
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Table 1.1 Web Portal requirements described on SIEMPRE Technical Annex (DoW).

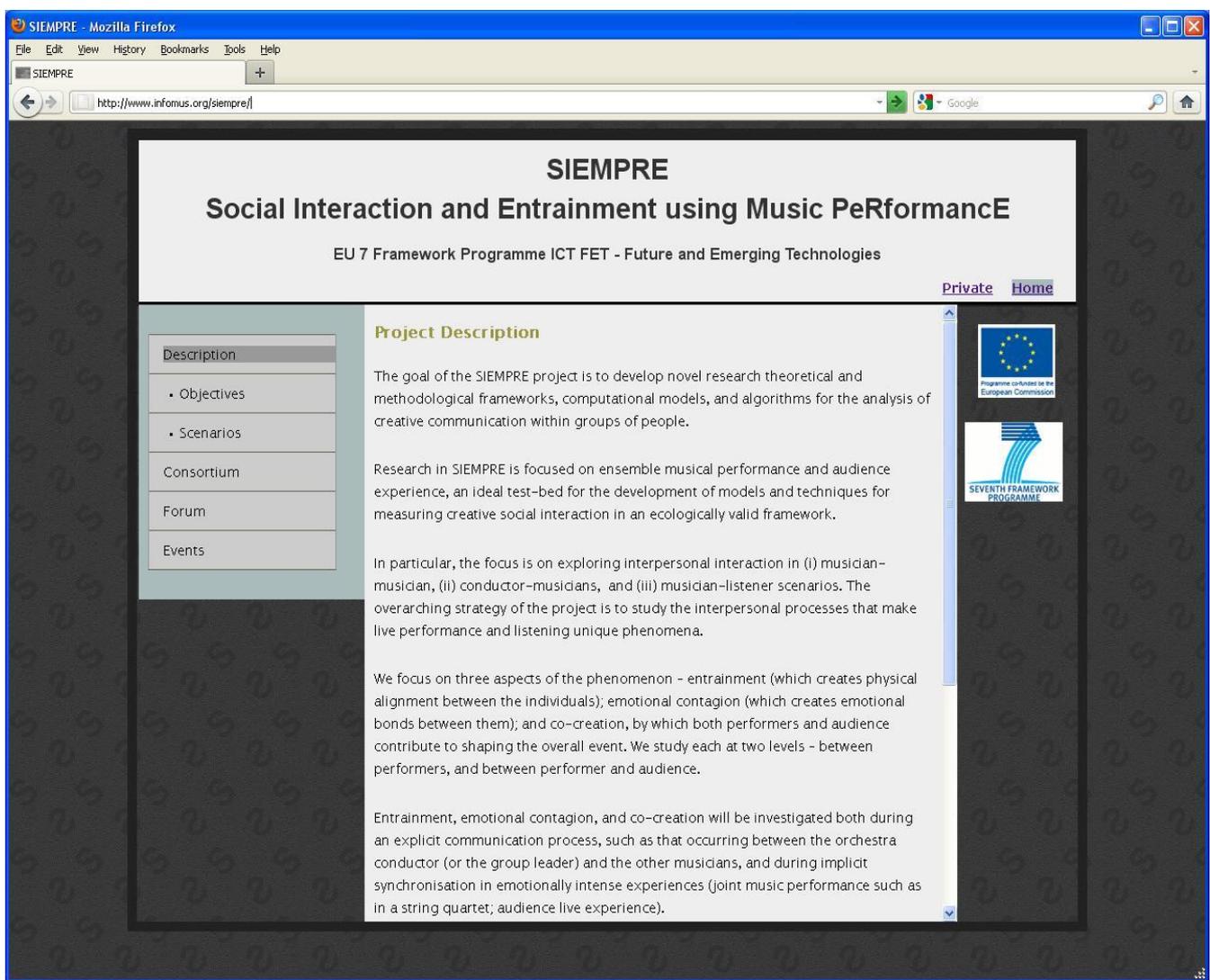


## 2. WEB PORTAL DESCRIPTION

The Siempre Web portal has been developed using the Silver Stripe platform (<http://www.silverstripe.com/>). We decided to use this CMS for the two following reasons:

- it is very simple to be used also from non-technicians, just having a password it is possible to modify pages content, to add or remove web pages and to upload files;
- it is an open source platform.

For the Siempre Web portal we developed a specific template (Figure 2.1).

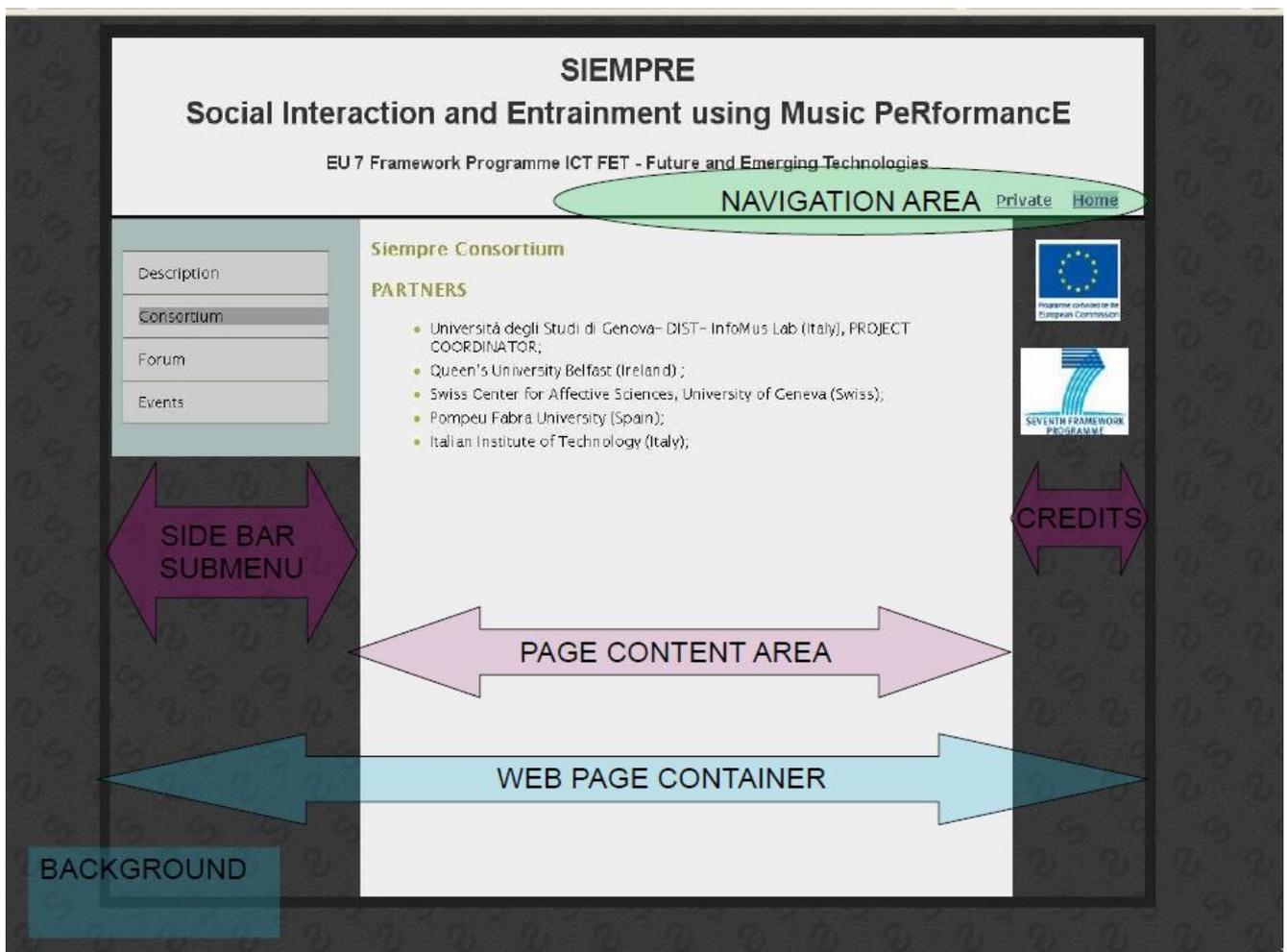


**Figure 2.1.** A Snapshot of the SIEMPRE home page.

## 2.1 TEMPLATE STRUCTURE

Figure 2.1, showing the SIEMPRE home page, highlights that the designed template is very simple. There is a background on which the page is drawn, this background is composed by the repetition of a small bitmap with the SIEMPRE initial and it covers all the browser page space (Figure 2.1.1).

The Container of the page is fixed in dimension (see Figure 2.1.1) and centered on the browser window, if the content of the page is greater then the available space a vertical scroll appears.

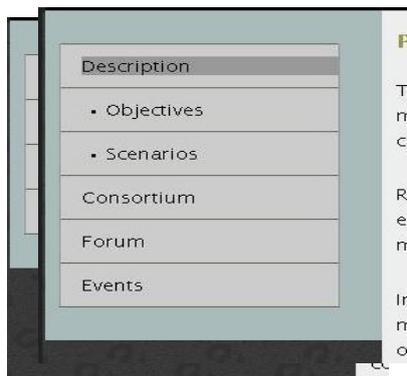


**Figure 2.1.1.** The layout of the web site Template. All the elements are identified by colored narrows or ellipse.

The navigation area is immediately under the website title, at the present there are the two main community areas:

- the **Home** link that forward to the public zone , and
- the **Private** link that forwards to the authentication page.

On the left side of the web page there is the **Menu** toolbar. Each item of it can have a sub-menu that will be displayed after its selection (Figure 2.1.2).



**Figure 2.1.2** An example of menu and sub-menu .

### 3. PUBLIC AREA

This zone of the web site is public. There are different pages aimed to describe the Project and the activities performed by the Consortium.

The SIEMPRE template currently allows a hierarchical 3-levels structure for the pages even if currently just two levels are used. Table 3.1 shows the list of pages, the content is in the Annex I of this deliverable.

FIRST LEVEL	SECOND LEVEL
Description	
	Objectives
	Scenarios
Consortium	
Forum	
Events	

**Table 3.1.** List and hierarchical structure of the on-line pages.

A Siempre Forum has been developed in the first month of the project. The forum is accessible by authentication even if the link is visible in the public part of the web site. This strategy has been decided in order to increase the dissemination of the public documents. In fact, it is possible to subscribe the forum by e\_mail and then to receive the password to access to it. The forum is mainly used by partners to open discussions on ideas and theoretical aspects, but it is open to external researchers.

The available pages satisfy the technical annex requirements on (i) project description, (ii) link to publications and public documents, (iii) events announcement, and (iv) brainstorming and discussion.

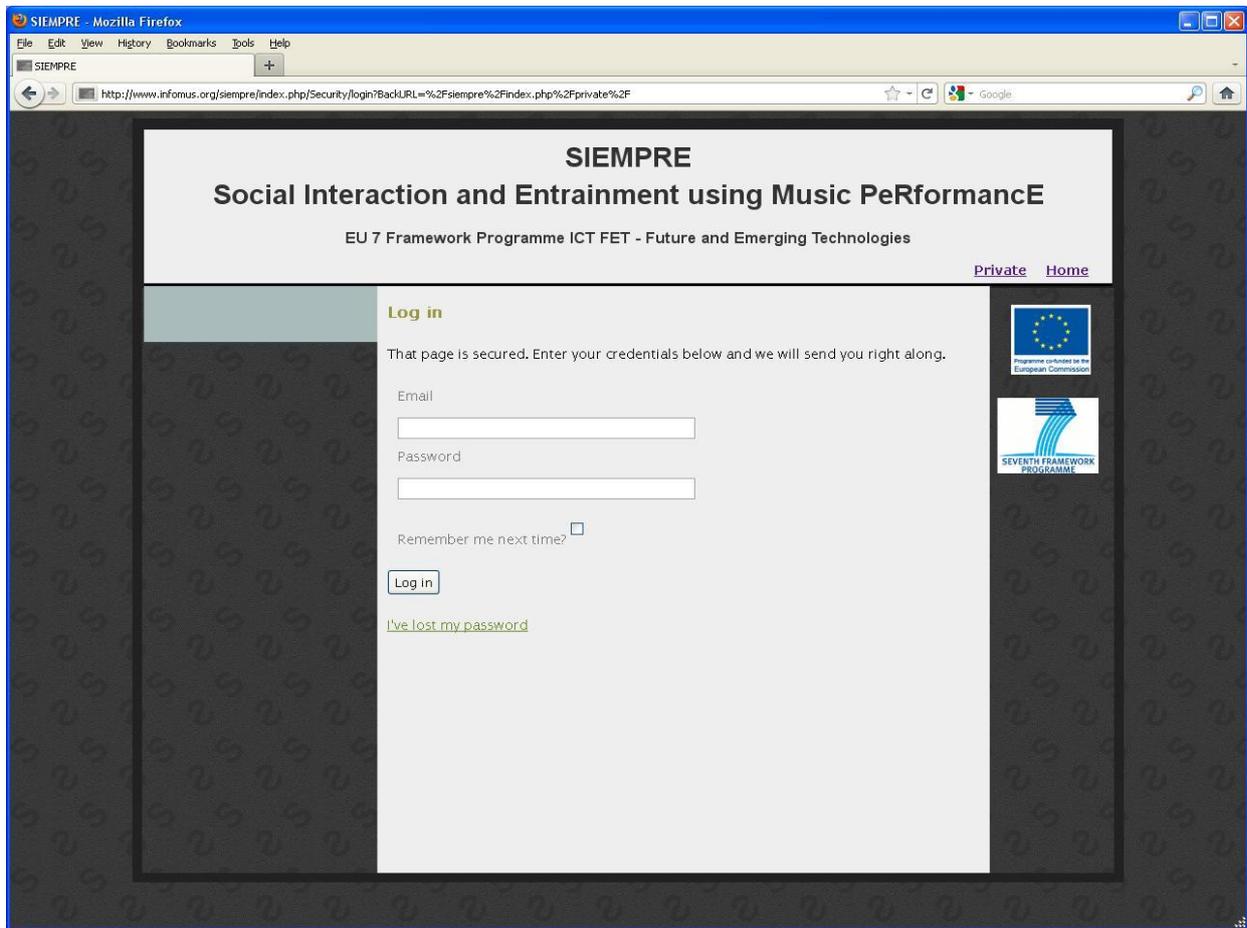
### 4. PRIVATE AREA

The private area has been designed to share documents and data through the Consortium. It is accessible via website by using a password (see Figure 4.1) .

During the first test period, we decided to use the same log-in for all the consortium

members in order to guarantee the same rights to all, even if the system can support different access right. This solution has been appreciated form the group that can share with their researcher data and publications.

The experimental data are stored on a web repository managed by UPF partner, the link to this repository is available inside the private area page.



**Figure 4.1.** The log-in page

In the Private data are currently available different repositories organized as follow:

- **Shared Paper:** it is a specific repository to share papers useful for the research.
- **Documents:** it is a repository used to share draft documentation or files, software modules, algorithms and so on useful for discussion and brainstorming.
- **Template:** it is the repository built by the coordinator to share the templates of the periodic reports.
- **Deliverable:** it is the repository to share through the Consortium the draft version of the deliverables.
- **Meeting Minutes:** it is the repository used to share and maintain the minutes of the meetings, brainstorming and important discussion.

The available pages satisfy the technical annex requirements on (i) an area for accessing the data included in the SIEMPRE Database, (ii) repository for internal communication purposes, (iii) repository for sharing algorithms and techniques, (iv) exchange of materials, and (v) coordination of activities.

## ANNEX1 - MAIN PUBLIC PAGES OF THE SIEMPRE WEB PORTAL

### PAGE: Home

#### Project Summary

The EU ICT-FET three-year Project SIEMPRE (May 2010 – April 2013) faces cross-disciplinary research to investigate novel paradigms on computational models of non-verbal creative group communication. The open research questions that SIEMPRE intends to tackle and contribute with research results include the following:

- What are the key factors driving the *interpersonal* synchronization among subjects (e.g., visual and auditory expressive cues, rules and conventions) and how these factors can be measured in ecological environments? In what ways do these vary according to the physical, emotional and social contexts?
- How can specific roles inside the group be identified (e.g., leadership, hierarchy) and measured? Can general principles be discerned concerning the influence of some individuals over others?
- What are the factors that determine feelings of group cohesion or a sense of shared meaning? Can the validity of such reports by participants be supported or confirmed by measures of expressive gesture, auditory cues, physiological signals?
- How does social context affect individual *intrapersonal* synchronization of expressive movement, auditory, physiological signals and vice-versa? In what ways does the emotion of the individual affect the collaborative creative product?
- Which are the neurophysiological foundations of creative group communication?
- Can performing arts and humanistic theories contribute to advances in scientific research on non-verbal social signal processing?
- Which impact of the research on future ICT systems: e.g., user-centric media, future media internet, future social media?

#### Upcoming SIEMPRE events:

- Qualisys Workshop, 15 April 2011
- FET11 Closing Performance: "TanGO – Touching Music", interactive performance for dancers and voice, 6 May 2011
- Intl Workshop on Social Behavior in Music, 27 May 2011
- INTETAIN 2011 Intl Conference, 25-27 May 2011
- Summer School on Affective Sciences, August 2011

#### News:

- the Italian national newspaper "La Repubblica" published in its weekly magazine "Il Venerdì di Repubblica" an article including several photos of preparatory experiments of SIEMPRE with the Quartetto di Cremona.
- Two interviews with the SIEMPRE Coordinator at the National RAI Radio3Suite and Radio3Scienza (the last during the "national day of research", 22 february 2011).



## PAGE: Project Description

The goal of the SIEMPRE project is to develop novel research theoretical and methodological frameworks, computational models, and algorithms for the analysis of creative communication within groups of people.

Research in SIEMPRE is focused on ensemble musical performance and audience experience, an ideal test-bed for the development of models and techniques for measuring creative social interaction in an ecologically valid framework.

In particular, the focus is on exploring interpersonal interaction in (i) musician-musician, (ii) conductor-musicians, and (iii) musician-listener scenarios. The overarching strategy of the project is to study the interpersonal processes that make live performance and listening unique phenomena.

We focus on three aspects of the phenomenon – entrainment (which creates physical alignment between the individuals); emotional contagion (which creates emotional bonds between them); and co-creation, by which both performers and audience contribute to shaping the overall event. We study each at two levels – between performers, and between performer and audience.

Entrainment, emotional contagion, and co-creation will be investigated both during an explicit communication process, such as that occurring between the orchestra conductor (or the group leader) and the other musicians, and during implicit synchronisation in emotionally intense experiences (joint music performance such as in a string quartet; audience live experience).

Real-time extracted multimodal features on movement, audio, and physiological data will be used to analyse expressive qualities, e.g., starting from research on multimodal expressive gesture (Camurri et al., 2005) and quantitative emotional estimation (Knapp et al., 2009): we refer to such multi-level features as expressive Movement, Audio, Physiological (eMAP) features. eMAP features are the inputs to the theoretical and computational models that will be studied in the project, capable to explain the processes underlying interpersonal creative communication. eMAP features will be extracted from participants (musicians, listeners, conductor) using real-time, synchronized, multi-modal feature extraction techniques.

The challenges and objectives of SIEMPRE are ambitious, and require cross-fertilisation among several disciplines: human-computer interaction, computer science, neurophysiology, psychology, cognitive musicology, artistic and aesthetic theories.

## PAGE: Project Objectives

Expected results:

- Methodological framework
- Models and techniques for the measure of entrainment, contagion, co-creation
- Models explaining the neurophysiological foundations of creative group communication
- Experiments to validate the methodological framework, models, and techniques
- Proof-of-concepts demonstrating the potential of the research output in future ICT (e.g., “embodied” social media, Web 2.0, future user-centric media)



- Annotated public archive of multimodal entrainment data

Planned activities:

- The organization of public events, live performances, scientific workshops, and specific initiatives, proposed to top level conferences (e.g. IEEE SocialCom, ACII Intl Conferences, Intl Conference on Neuroscience and Music, Intl. Conf on Music and Emotion) and within emotion research communities (emotion-research.net);
- Focused Workshops, with invited experts providing feedback and involved in the evaluation process of Deliverables at specific Milestones;
- Comparison of research results with companion projects in Japan (S. Hashimoto, Waseda University) and US (Stanford University, CCRMA);
- Scientific papers in outstanding journals (e.g., ACM, IEEE Transactions);
- Evaluation of proof-of-concepts with ICT and music professionals, as well as non expert participants.
- Neurophysiological experiments for evaluation and theoretical assessment.

## PAGE: Research Scenarios

In the SIEMPRE project three different experimental research scenarios will be faced to show the subtle and complex social interactions taking place:

1. between expert as well as non expert string quartet musicians during live musical performance,
2. during the communicative process of orchestra conduction of an orchestra section,
3. in audiences assisting to music performances.

### Scenarios research challenges

The scenarios 1 and 2 explore the entrainment and emotional contagion between small and medium numbers of expert performers. The third is implemented to understand what happens among large groups of listeners, i.e what happens in the live-performance scenario and if there is an emotional contagion between performers and their audience. Each scenario has specific challenges and common visions below described.

*String Quartet:*

- Do the expressive, emotional and social contexts affect the interpersonal entrainment and emotional contagion observed across the various modalities or in a combination of the modalities?
- In the case of changes in the context, is the group of musicians able to find strategies in order to re-establish the feeling of synchronisation and group cohesion? How does this affect emotional contagion as indicated by the autonomic physiological signals?
- Does entrainment observed in one modality influence entrainment in the other modalities? E.g., breath cycle entrainment entrains behavioural entrainment?
- In the case the leading music score, usually played by the first violin, is switched to the second violin, is it still possible to determine the leadership in the group?
- Can the motoric component alone (see Scherer's "Component Process Model", Scherer, 2001) explain the entrainment or does autonomic activity (as effected by emotion) play a role?

*Orchestra Conduction:*

- What kind of communication is achieved during conduction?



- How does the conductor motorically drive the orchestra?
- Is there any relationship between the efficiency of this communication, the degree of inter-individual synchronisation, the amount of entrainment, and the quality of musical production?
- From a neurophysiological point of view, what are the common neuronal substrate and cognitive processes shared by action, language, and music?

*Audience experience:*

- How can we measure the quality of audience experience?
- How does entrainment among performers affect audience experience?
- How does emotion among performers affect audience experience?
- How does co-creation by the audience affect audience experience?

## PAGE: Siempre Consortium

### PARTNERS

- Università degli Studi di Genova- DIST- InfoMus Lab (Italy), PROJECT COORDINATOR;
- Queen's University Belfast (Ireland) ;
- Swiss Center for Affective Sciences, University of Geneva (Swiss);
- Pompeu Fabra University (Spain);
- Italian Institute of Technology (Italy);

## PAGE: Events

### Upcoming Events

- Concert-experiments to collect multimodal data, in collaboration with GOG-Giovine Orchestra Genovese, with Music Conservatory of Genoa, and with Quartetto di Cremona are ongoing (February-June 2011). A multimodal recording is planned on April 7th with Lyskamm Quartet, in occasion of their concert in Genoa.
- Workshop on [Multi-Modal Data Acquisition for Musical Research](#) hosted at [NIME 2011](#) Intl Conference (May 30th - June 1st).
- Experiments on analysis of physiological signals on visitors of science center exhibits: during year one the following public events-experiments have been organized: Biorhythms in Dublin (2010) and at Festival della Scienza, Genova (during the First SIEMPRE Workshop), November 2010. These experiments are now continuing for two months in New York City at the Eye Beam.
- Qualisys Workshop, Casa Paganini Friday 15 April 2011. This year workshop will disseminate with all Qualisys users the methodology and research developments in SIEMPRE. More info at [www.qualisys.com](http://www.qualisys.com).
- [Summer School in Affective Sciences](#) on the topic "Emotion expression and communication: verbal and non-verbal perspectives", 22-31 August 2011. A workshop on "Music and emotions" and "Emotion communication in music and singing" is organized by UNIGE-CH with the contribution on other Siempre



- partners.
- [SBM2011](#) Second International Workshop on Social Behavior in Music (May the 27th) hosted at INTETAIN 2011. This workshop, partially supported by EU-ICT-FET Project SIEMPRE, focuses on the social signals and their features that are most significant for a qualitative and quantitative analysis of social behavior and experience in music.
  - FET11 Closing Performance: "TanGO – Touching Music", interactive performance for dancers and voice, 6 May 2011.

### Past Events

Project presentation and events at Festival della Scienza, Genoa, Casa Paganini, 29 October - 7 November 2010:

- Technical workshop on theoretical frameworks and experimental designs at the Swiss Center for Affective Sciences in Geneva the 4<sup>th</sup> of December 2010;
- November 7, 17:00-18:00, Seminar by Luciano Fadiga (IIT), "Empathy, Music, and Neurosciences", with the participation of Ben Knapp/SARC Queen's University of Belfast and Casa Paganini scientific staff;
- November from 2 to 7, 10.00-13.00, 14.00-17.00, Experiment "E-Motion - Un Laboratorio-Esperimento a Casa Paganini", proposed and organised by SARC Queen's University, Belfast in collaboration with InfoMus-Casa Paganini and IIT;

