

<b>SIEMPRE</b>		Page 1 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

# SIEMPRE

## D5.2 – Plan for dissemination

<i>Version</i>	<i>Edited by</i>	
0.1	Didier Grandjean	Document preparation
0.2	Antonio Camurri and Gualtiero Volpe	Added new content
1.0	Antonio Camurri, Didier Grandjean, Ben Knapp, Gualtiero Volpe	Updated content on public events

<b>SIEMPRE</b>		Page 2 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

## TABLE OF CONTENTS

1. Introduction, p.3
  2. Scientific papers in international journals and conferences, p.4
  3. Organization of international Conferences, Workshops, Summer Schools, Special Sessions at international conferences, p.6
  4. Organization of public events, p.11
  5. Interviews, AV content and articles on the media (newspapers, television, radio, internet), p.12
- Appendix I: Proposal of artistic performance at Closing Session of FET 2011 Conference, p.13
- Appendix II: Proposal of Session at FET 2011, p.17
- Appendix III: Proposal of Poster at FET 2011, p.20

<b>SIEMPRE</b>		Page 3 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

## 1. Introduction

The dissemination plan of SIEMPRE includes a number of activities aiming at a bringing the concept, the research challenges, and the research results to a broad audience of experts as well as non experts, including academia, industry, and common citizens.

The main channels for dissemination in SIEMPRE are the following:

- Scientific papers in international journals and conferences;
- Organization of international workshops, of special sessions at international conferences;
- Organization of public events for both experts and non expert audiences where research results are presented and demonstrated;
- Articles in newspapers, interviews in media (television, radio, internet),
- Video demos available on internet (eg YouTube)
- Archive of experimental data publicly available for the international community of researchers
- Continuous updating of the project web site.

During the first year of the project, already a number of significant public events and scientific publications have been produced by SIEMPRE. They are shortly reported in this Deliverable.

This Deliverable has been released on the Project Web Portal on Nov 2010, and the Appendixes have been updated on Feb 2011.

<b>SIEMPRE</b>		Page 4 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

## 2. Scientific papers in international journals and conferences

The SIEMPRE community plans to publish the results of the studies in international peer-reviewed journals and conferences. In the following, some main examples of possible target journals and conferences are listed. Of course, the following list should be intended as an open list.

Journals specialized in emotion, music, computer science, social signal processing:

- Cognition and Emotion
- Computer Music Journal
- Emotion
- IEEE Transactions on Affective Computing
- IEEE Transactions on Multimedia
- IEEE Transaction on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Computer-Human interaction
- IEEE Transactions on Systems, Man and Cybernetics, Part A and B
- Intl Journal of Human-Computer Studies
- Journal of Mathematics and Music
- Journal of New Music Research
- Musicae Scientiae
- Music Perception
- Signal processing

Journals specialized in neuroscience and publishing studies related to music

- Cerebral Cortex
- Journal of Neuroscience
- Nature Neuroscience
- NeuroImage
- Neuron

Conferences related to social signal processing, computer science, emotion, and music

- ACM Multimedia
- IEEE International Conference on Social Computing
- International Conference on INtelligent TEchnologies for interactive enterTAINment
- International Conference on Music and Emotion (ICME)
- Intl Conf on New Interfaces for Musical Expression (NIME)

<b>SIEMPRE</b>		Page 5 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

- Intl Conf on Sound and Music Computing
- Power of Music: Joint MSA / ICME Conference, 2011

### Conferences related to neuroscience and for a better understanding of music processing

- Cognitive Neuroscience Society annual meeting (CNS)
- Human Brain Mapping (HBM)
- International Conference On Cognitive Neuroscience (ICON)
- Society for Neuroscience (SFN)

During the first year of the project, the consortium already published a number of papers in International Conferences and Journals, including the following:

Glowinski, D., Camurri, A., Chiorri, C., Coletta, P., Schenone, A., Volpe G. (2010). Multi-Scale Entropy Analysis of Dominance in Social Creative Activities, Proc ACM Multimedia Intl Conference, Firenze, ACM Press.

Several other papers by SIEMPRE partners are in course of preparation and under revision.

<b>SIEMPRE</b>		Page 6 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

### **3. Organization of international Conferences, Workshops, Summer Schools, Special Sessions at international conferences**

SIEMPRE organizes public workshops and special sessions at international conferences. Project exemplars and proof-of-concepts will be discussed during the internal workshops and will be presented during public events (see below).

#### **Internal workshops - CO-RE-PP**

The different kinds of workshops might be combined to promote interactions between the different levels of elaboration.

- Technical workshops : this kind of workshop will be dedicated to technical issues such as synchronization of data acquisitions with different systems (VICON, physiological measures, eye tracking, etc.)
- Theoretical workshops: these workshops will be dedicated to theoretical models of music, synchronization and emotion. During these workshops issues concerning hypotheses and operationalization will be discussed among the SIEMPRE partners.
- Methodological workshops: the main aim to these workshops will be dedicated to desing experiments on the basis of technical and theoretical workshops.

The following internal workshops have been organized by the Consortium:

Kick-off Meeting (Genoa, May 2010), Barcelona Workshop (one week, September 2010), Geneva Workshop (3-4 December 2010), Technical Workshop on experiments with thermocameras, Genoa (4-5 March 2011), Belfast Technical Workshop (25 March), Genoa Workshop 14-15-16 April 2011 (in collaboration with Qualysis).

#### **Public workshops, conferences, summer schools, special sessions**

SIEMPRE will work at organizing international conferences, workshops, panels, and courses in Summer schools on the core scientific areas of the project.

During the first year SIEMPRE is contributing to the organization of the following public scientific events:

<b>SIEMPRE</b>		Page 7 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

**INTETAIN 2011 ([www.intetain.org](http://www.intetain.org)), The 4th International ICST Conference on Intelligent Technologies for Interactive Entertainment, Genova, Palazzo Ducale, 25-27 May 2011 (in cooperation with ACM SIGCHI).**

Intetain intends to stimulate interaction among academic researchers and commercial developers of interactive entertainment systems.

Intetain focuses on the development of novel user-centered intelligent computational technologies and interactive applications for entertainment, being made possible through the use of a wide range of interactive device technologies (e.g., mobile and wearable devices, home entertainment centers, haptic devices, wall screen displays, information kiosks, holographic displays, fog screens, distributed smart sensors, and immersive displays) and media delivery infrastructures (e.g., multimedia networks, interactive radio, streaming technologies, DVB-T/M, ITV, P2P, satellite broadcasting, UMTS, Bluetooth, Broadband, and VoIP).

**2<sup>nd</sup> International Workshop on Social Behaviour in Music ([www.infomus.org/SBM2011](http://www.infomus.org/SBM2011)), a satellite event at INTETAIN 2011, Genoa, Palazzo Ducale, 27 May 2011.**

Music making and listening are a clear example of human activities that are above all interactive and social. On the one hand, however, nowadays mediated music making and listening is usually still a passive, non-context sensitive, and non-social experience. The current electronic technologies, with their potential for interactivity and communication, have not yet been able to fully support and promote these essential aspects. On the other hand, new mediated forms of sharing music experience in a social context with local or remote users or as a part of a community are emerging. Novel research challenges are faced and novel disciplines develop, e.g., Social Signal Processing. Foundational issues such as techniques for identifying the leader in a group of users, for measuring the cohesion of the group, for recognizing and stimulating empathy between the participants, find in music an ideal test-bed for research and for scientific and technological investigation. In this framework, new paradigms for embodied and active experience of music are needed, where multimodal non-verbal communication channels, and in particular movement and gesture, play a central role. Perspectives such as pervasive embodied social music networks, grounded on the Future Internet, become a concrete scenario for the near future. This workshop 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. It will discuss computational models, algorithms, and techniques for analysis of social behavior in music, their application in concrete test-beds, their evaluation in experimental set-ups, and their exploitation in future scenarios. The workshop will explore many-to-many human interplay, such as performer-listener, performer-performer, performer-conductor, and listener-listener interaction, in novel scenarios where the

<b>SIEMPRE</b>		Page 8 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

distinction between listeners and performers fades out and users become producers and consumers of music experience.

The Second International Workshop on Social Behavior in Music (SBM2011) represents an occasion for researchers and practitioners to meet and discuss about social behavior in music: e.g., which are the multimodal signals characterizing social experience in performers and listeners interplay?; how to model interaction in groups of performers, in the audience, between audience and performers?; which is the minimal set of low-level features describing interaction in performance? which are the social signals that better describe social interaction in music? To face such challenges, integration is needed of research in engineering and physics, as well as in human sciences, e.g., social psychology.

**Summerschool in Affective Sciences on the topic "Emotion expression and communication: verbal and non-verbal perspectives", 22-31 August 2011, (<http://www.affective-sciences.org/issas>)**

During the International Summer School in Affective Sciences 2011 the UNIGE-CH partner is organizing a workshop on "Music and emotions" and "Emotion communication in music and singing" with the contribution of Klaus Scherer, Bernardino Fantini, Edouardo Coutinho, and the SIEMPRE partners as well as international specialists in music processing and emotions. A workshop hands-on about "A Matlab toolbox dedicated to the extraction from audio files of musical features" is also planned.

**Qualisys Workshop, Friday 15 April 2011**

Several partners in the SIEMPRE project decided to use the Qualisys motion capture system for the SIEMPRE experiments, due to its particular features including the possibility to integrate with the SIEMPRE architecture for synchronized multimodal recordings. UNIGE, QUB, IIT have the Qualisys system at their labs for implementing the multimodal recordings planned in SIEMPRE.

The Qualisys company asked UNIGE to host the annual Qualisys workshop. This year workshop will disseminate with all Qualisys users the methodology and research developments in SIEMPRE.

Here follows the invitation letter from Qualisys to the participants:

<b>SIEMPRE</b>		Page 9 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	



The International Centre of Excellence **Casa Paganini - Infomus Lab**, will host this [Qualisys](#) Workshop. The meeting will take place in the historical [Casa Paganini](#) located in old town Genova.

**On Thursday 14 April** Qualisys will be present at Infomus Lab for an open session where we are available for specific requests/questions, please contact us for an appointment.

**Topics Friday 15 April:**

We are looking forward to the workshop, which is bound to be a pleasant day of sharing information and experience around the use of Qualisys motion capture system together with different applications like Infomus lab focus on cross-fertilize scientific and technological research with humanistic and artistic research.

**QTM software:** Latest/upcoming functionality like PAF (Project Automation Framework), a way to automate the collection/export/analysis and report direct in QTM.

**Oqus camera technology:** Development of hardware.

**Motion/Sound/Video in synch:** Further information about this use in QTM. The idea is to have a practical demo on the scene

**Biomechanical Analysis with Visual3D:** Nils Betzler, a specialist in Visual3D, will present biomechanics functionality like inverse kinematics, functional joint centre calculations...

**The EyesWeb:** Presentation of the platform, an open software platform to support the development of real-time multimodal distributed interactive applications; novel features: loops, integration with Qualisys, multimodal synchronized recordings for the analysis of non-verbal social behaviour.

**Exchange experience Qualisys users:** User presentations of the work from the participants.

In the evening we hope to enjoy a social dinner together.

**To register and practical info for workshop:** *(The workshop is free of charge for participants)*

- Last day to register: **5 April 2011**.
- By e-mail: Send the registration form to [mats.kanarbik@qualisys.se](mailto:mats.kanarbik@qualisys.se) or fax: +46 31 336 94 20.
- Address: Piazza Santa Maria in Passione, 34
- Participants take care of their own transport and hotel accommodation

*Due to limited space, we may have to limit attendance to 3 participants from each lab respectively.*

We warmly welcome all Qualisys users and specially invited guests. Later we will come back with a time schedule of the day.

<b>SIEMPRE</b>		Page 10 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

**Qualisys and Elekton Team:** Fredrik Müller/ Mats Kanarbik / Nils Betzler and Maurizio Negro

**Infomus Team:** Paolo Coletta, Simone Ghisio, Corrado Canepa, Antonio Camurri, Donald Glowinski, Maurizio Mancini, Alberto Massari, Barbara Mazzarino, Roberto Sagoleo, Giovanna Varni, Gualtiero Volpe.

With the partial support of the FP7 EU ICT FET Project SIEMPRE.

## **Workshop on Multi-Modal Data Acquisition for Musical Research Hosted at NIME 2011 Intl Conference ([www.nime2011.org](http://www.nime2011.org))**

Workshop Web Page:

<http://www.nime2011.org/pre-nime/tutorials/#Workshop%20on%20Multi-Modal%20Data%20Acquisition%20for%20Musical%20Research>

We present a workshop on multi-modal measurement and recording of musical performance. This workshop lasts 3 hours, and it will include a presentation of the current technologies and new techniques for data acquisition and synchronization of music and performing arts research experiments using Qualisys (motion capture), BioControl/Infusion (physiological sensors), Arduino (general data acquisition), Motu (audio), and Polhemus (motion sensing) systems among others. We will demonstrate validated techniques developed by our researchers in order to obtain reliable data for the SIEMPRE (Social Interaction using Music PeRformance Experimentation) European project.

This workshop will first describe a specific scenario where multi-modal measurement of musical performance is required and outline the various problems raised by the scenario. We will then present some of the solutions developed by the SIEMPRE project and open a collaborative discussion with the participants about their particular needs and possible solutions.

### **About the Workshop Leaders**

**(QUB) Javier Jaimovich, Nick Gillian** and **Miguel Ortiz** are members of the researcher staff at the [Sonic Arts Research Centre](#) working with the [Music, Sensors and Emotion](#) group. Their research topics range from real-time gesture recognition for Musician-Computer Interaction to analysis of physiological signals for interactive performance and cinema.

**(UNIGE) Paolo Coletta** joined the [EyesWeb](#) research project in 1997 and is currently the main software project manager and developer to support the EyesWeb project at Casa Paganini - [InfoMus research](#) centre of University of Genoa.

<b>SIEMPRE</b>		Page 11 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

**(UPF) Esteban Maestre** pursues research in expressive music performance, instrumental gesture analysis, instrumental sound synthesis, gesture-sound relationship, and audio and voice analysis and transformation at the [Music Technology Group](#).

### **Prerequisites and Participation Information:**

The workshop is intended for anyone interested in understanding the technical challenges of multi-modal measuring of musical performance. Whether it is for implementing multi-modal systems for recording and analysis or for live performance practice. It is also intended for researchers in different areas such as: synchronization protocols, file systems, gestural descriptors, etc. to know about the current challenges faced by their peers and discuss what further developments might yield.

It is open to both the novice as well as those that are already experienced in specific techniques but might be interested in learning more about working with large multi-modal systems.

**Maximum number of participants:** 10-12

## **4. Organization of public events**

Public events include SIEMPRE contributions to:

- International well known festivals of music including
- Montreux Jazz Festival in Montreux (Switzerland): we plan to organize workshops to promote the knowledge accumulated by SIEMPRE partners about performance and audience perception.
- Ambronay Festival: baroque music will be a typical music style to evaluate audience perception of performance and interactions between musicians in quartet or orchestra.
- 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.
- Proposal of events at FET2011 (see Appendix).

<b>SIEMPRE</b>		
		Page 12 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

## **5. Interviews, AV content and articles on the media (newspapers, television, radio, internet)**

The project will support dissemination in various media, including television and radio programs, project web portal, a YouTube channel dedicated to the SIEMPRE project, articles in national newspapers and magazines.

At the beginning of the SIEMPRE project, 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 ("Venerdì di Repubblica", 5 March 2010, pp.64-66). Two interviews with the SIEMPRE Coordinator at the National RAI Radio3Suite and Radio3Scienza (the last during the "national day of research", 22 february 2011) were performed.

<b>SIEMPRE</b>		Page 13 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

**Appendix I – Proposal of artistic performance at Closing Session of FET 2011 Conference:**

***“tanGO - Touching Music”*** A Performative Workshop for Dancers and Voice  
**Proposer: Casa Paganini – InfoMus research centre, DIST, Università degli Studi di Genova**



<b>SIEMPRE</b>		Page 14 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

## Description

### Participants:

- 4 dancers
- 1 vocalist (Roberto Tiranti)
- The artistic and research team of Casa Paganini-InfoMus of University of Genoa

### Duration:

About 25min + 10min of “backstage” (to be defined, for explaining the scientific aims)

### Music:

Based on vocal arrangements of tango music by Astor Piazzolla.

### Choreography:

Giovanni Di Cicco

Interactive technology for real-time expressive movement analysis and social signal processing (also based on results from the EU ICT FET SIEMPRE Project): Casa Paganini-InfoMus research centre, University of Genoa ([www.casapaganini.org](http://www.casapaganini.org))

### Concept:

The latin verb *tango* means “being near to”, entering in a place, touching, but also “stimulate”, “to be moved” in the sense of affect.

In modern languages, the noun *tango* refers to a binary rhythm dance, originated in Argentina by the end of the XIX century, which has become an emblem of the capacity to communicate - by intertwining music and gesture - emotions impossible to express by words.

Our artistic performance considers both the above mentioned meanings of *tango*. It weaves a profound link between the “expressive quality of a movement” in dance, from one hand, and its capacity to explore, define, inhabit a physical space, to create dynamically evolving social interactions, affective resonances and empathic responses of the bodies, expressed by music and dance. Cues of such expressive and empathic behavior can be measured by innovative technologies, in terms of “emotion maps” and non-verbal social signals, capable to determine, conduct in real-time an expressive and emotional interpretation of the tango music.

This artistic performance aims to show, to bring on stage some of the core scientific research challenges of the Casa Paganini – InfoMus research centre, with particular focus on those faced in the ongoing SIEMPRE EU FET Project.

## The Performance

### Phase I.

The first dancer enters on stage. His entrance causes the emergence of sound from the space where he is moving. The dancer remains still: music stops. The dancer restarts to move: music re-emerges. When he goes far from his initial position on the stage, he discovers that the music changes in different areas of the stage: the stage is a map of different music content. Further, he understands that his active

<b>SIEMPRE</b>		Page 15 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

presence with movement evokes, from the silence, the different parts of the same music composition (the Tango), which usually are listened as a whole piece overlapped in synchronous. His choreographic exploration allows him (and the audience) to discover the music structure as it were a physical space to explore, to freely navigate into.

The first phase is concluded when the audience realizes and understands how the physical exploration of the space evokes sound: the dancer *wears* the sound of the music score (the choreography produces the sound).

*Scientific aim: "Mise en scène" of the novel modalities and possibilities for active experience of pre-recorded music content. A model of active experience of audiovisual content as exploration.*

### **Phase II.**

Once the exploration is completed, the first dancer stops on a position-voice. Then, the second dancer enters the stage, who starts in his turns the exploration of the stage (Phase I) arriving to stop on a second different position-voice. But the audience realizes that something is changed in the music explored by the second dancer: the voices are the same, most likely the music is the same, but its interpretation is different. Only the subsequent explorations, the third and fourth, and with short comparisons/dialogues between couples of dancers, will enable the audience to understand that the dominant expressive quality of the movement of each dancer (hesitant, fluid, explosive, ...) determines the interpretation (and the emotional quality) of the music he/she is exploring. This awareness in the audience concludes the Phase II.

*Scientific aim: "Mise en scène" of the possibilities to analyze the non-verbal affective qualities of gesture as a modality to search and emotional reinterpretation of audiovisual content.*

### **Phase III.**

The four dancers now wish to reconstruct the whole musical work, whose single voices and interpretations are embodied in their physical full-body movement.

Each dancer restarts to move together the others, but each remains closed in his/her own peculiar quality of movement: therefore, he/she is not able to empathize with the others, in order to reconstruct the musical piece (i.e., one is hesitant, one fluid, one explosive: the corresponding musical interpretations of their voices are not compatible when mixed together).

The resulting audio effect shows and reveals this impossible contact: the music voices are out of synchronism with each other, with an entropy emerging on musical fragments, which are heterogeneous from the timbre, interpretation, and musical viewpoints.

The understanding (by the dancers and the audience) of the awareness of the impossibility to exit from this growing musical chaos generated by the gestural individualism causes the access to the Phase III.

*Scientific Aim: "Mise en scène" of the scientific challenges on measuring non-verbal communication, and on the importance of the understanding and modelling of empathic behavior (core research challenges in the EU FET SIEMPRE Project).*

### **Phase IV.**

To exit the situation of maximum entropy (Phase III), it is necessary a mediator tool capable to determine a leadership and to define, around itself, a shared gestural grammar, that drives the dancers to establish an empathic relation. A dancer-leader grasps a mobile phone (this enhances the measures of gesture qualities by means of the embedded 3D accelerometers). The other dancers stop, thus causing silence. The new gestures that the dancer adopts to move his mobile phone make it independent from the areas of the stage (Phases I and II), and teaches to the other dancers the possibility of a social expressive

<b>SIEMPRE</b>		Page 16 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

movement. Also the other dancers grasp mobile phones (one for each dancer) and join the first with coherent movements. The choreography will lead to a progressive entering into synchronization of the movements performed with the mobiles. This phase is completed as soon as the aim failed in the previous phase III is here achieved: to reveal, by means of the empathic movement of the dancers, the original tango piece in its beauty and completeness of the four synchronized voices.

The achievement of this objective will be emphasized by the spectacular *live* appearance of the singer, who will gain the centre of the stage (adding his fifth voice to the four achieved and inhabited by the bodies of the dancers).

*Scientific aim: "Mise en scène" of the research on models and techniques to measure leadership in non-verbal communication, by exploiting expressive and affective gesture, and techniques to measure entrainment / synchronization (core research challenges in the EU FET SIEMPRE Project). [Stimulating/Provoking issue: the role of technology in social communication: are we still able to communicate without technology? Is the figure of a "leader" always necessary, as it is here?]*

#### **Phase V.**

The four dancers, aware of their achievement of their definitive affective empathy, go away from each other, leaving the scene to the singer and going toward the audience.

But their progressive going near to the audience, the voices evoked by their gesture are progressively destroyed, become thin, bony, reduced to a whisper, pure rhythmic pulse: the dancers will need to involve the audience to actively contribute, in order to re-establish the strength of their sounds. The communication between dancers and the singer will occur by means of the animation of the members of the audience. A couple of dancers will be with the audience in the left part of the room, the other two on the right of the room, both near the audience below the stage.

Each pair of dancers (each pair alternating with the other), will teach to his area of audience to retrieve the original voices by means of a shared simple synchronized movements (observed by a videocamera hidden on stage).

This phase is concluded when all the audience will be in active resonance with the singer, having the dancers as animators.

When the audience will achieve in re-conquering the beauty of the music (previously obtained in Phase IV), the tango will have a final timbre and dynamic apotheosis, with a metamorphosis into the whole richness of the original orchestration which will enable the singer to conclude the performance.

*Scientific aim: "Mise en scène" of the research on gestural communication within large groups of people, emotional contagion, propagation, co-creation. (core research challenges in the EU FET SIEMPRE Project).*

**NOTE: the above sketch is a preliminary draft of the project, which will be further refined and improved along the preparation**

<b>SIEMPRE</b>		Page 17 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

## **Appendix II - Proposal of Session at FET 2011: *Towards Computational Models of Creative Group Communication: Non-Verbal Expressive Gesture, Entrainment, Dominance, Co-Creation, Emotional Contagion***

The challenges faced in this session include perspectives of cross-disciplinary research to investigate novel paradigms on computational models of non-verbal creative group communication. The open questions include the following:

1. What are the key factors driving the *interpersonal* synchronisation 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?
2. 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?
3. 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?
4. How does social context affect individual *intrapersonal* synchronisation of expressive movement, auditory, physiological signals and vice-versa? In what ways does the emotion of the individual affect the collaborative creative product?
5. Which are the neurophysiological foundations of creative group communication?
6. Are performing arts and humanistic theories contributing to advances in scientific research on non-verbal social signal processing? Recent results from the EU ICT FET SIEMPRE project will be presented.

Short statements by participants will introduce the session in order to address and clarify the research challenges listed above.

The second part of the session is organized as a panel open to all participants and the audience. In particular, guidelines on the relations between art and science in the study of social signal processing, and future perspectives for ICT will be addressed.

Target audience: scientists, industry and business representatives in ICT, students in scientific and humanistic disciplines, media representatives, artists.

Proposers: Antonio Camurri, Gualtiero Volpe

Participants: Roddy Cowie, Alessandro D'Ausilio, Stephane Dupont, Luciano Fadiga, Didier Grandjean, R. Benjamin Knapp, Carmen MacWilliams, Anton Nijholt, Maja Pantic

With the partial support of the EU FET SIEMPRE Project.

<b>SIEMPRE</b>		
		Page 18 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

***NOTE:** The proposers of this proposal also submitted a proposal for the “FET 2011 Final Artistic Event”: in case this proposal will be accepted, this session will face the research challenges behind the artistic event, which coincide with the scientific challenges of this session proposal.*

### **Position Statements** (excerpts)

#### *Creative Group Communication and Novel Paradigms for Active Experience of Cultural Content Antonio Camurri and Gualtiero Volpe*

Theatre stage performances, political ceremonies, artistic performances, music, and dance aim at making participants to act together: to share and shape, to mould, co-create cultural content by means of – often highly emotional and aesthetic – active experiences. Future networked and social media technologies should be exploited for promoting new ways of experiencing cultural events and artefacts. Non-verbal social signals, including expressive and empathic behavior, are the main component of future social media characterized by embodiment and physical engagement of users. The presentation discusses perspectives on novel interaction paradigms, grounded on the analysis of nonverbal emotional and expressive behaviour, of nonverbal social behaviour in small groups, and on personalised interactive narratives.

#### *Physiological modulations and perception of musical expressiveness by audience: a combined thermographic and explicit dynamical judgment approach Didier Grandjean, Dept. of Psychology, University of Geneva, Switzerland*

Musical expressiveness can be studied at least at two levels i) the induced physiological reactions of an audience, for example using temporal fine grained thermographic measures during musical exposures of different kinds of expressiveness and ii) the explicit judgments of emotions expressed by the music. We combined these two approaches in order to investigate the relationships between explicit judgments of emotion express through music and the physiological reactions related to felt emotions in response to the same musical excerpts. Preliminary results will be discussed.

#### *Learning from Synchrony and Mimicry in Face-to-Face Interaction Anton Nijholt, HMI Research Group, University of Twente*

In recent years attempts have been made to determine dominance, status, and role of participants during face-to-face (small group) interactions from nonverbal interaction cues. There have also been attempts to detect group characteristics (e.g., cooperative vs competitive) by aggregating cues from individual group participants. Until now synchrony and mimicry are not among the cues that are taken into account when studying characteristics of groups and their members. We argue that adding synchrony and mimicry cues will improve currently available characterization results.

#### *Neurophysiological foundations of creative group communication Luciano Fadiga and Alessandro D’Ausilio, IIT – The Italian Institute of Technology*

Human non-verbal communication relies on the efficient decoding and encoding of significant messages among people. In creative groups, such as orchestra or quartet players, the ability to recognize other’s gesture may be critical in enabling efficient coordination among participants, that in turns may trigger aesthetic appreciation in the listeners. The neural mechanisms supporting these critical social skills may

<b>SIEMPRE</b>		Page 19 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

reside in the mirror neuron system. In fact, this is parieto-frontal brain network translating visual (and also auditory) information into the motor plans to actually execute the same actions. Therefore, decoding other's gesture may be an unmediated direct matching between the actual motor plans of both the sender and the receiver. However, most research in the mirror neuron literature has focused on simplified scenarios with little or no real social interaction. In the context of the SIEMPRE project we aim study mirror-mechanisms in multi-subjects realistic and ecological interaction scenario. Furthermore, we aim to directly relate the strength and quality of communication between participants to the physiological and subjective reactions elicited in the listeners. In fact, orchestras or quartets may build a complex network of communications in order to achieve a common aesthetic goal – that here we aim to quantify and describe for the first time.

*Contributions of Performing Arts to advances in scientific research on Creative Group Communication*  
*Carmen Mac Williams, Grassroots Arts and Research, Germany*

In the Performing Arts real time improvisation and audience participation is a used technique for interactive storytelling in the frame of a defined time, set, theme and roles to determine a sense of shared meaning. The Creative Group Communications for interactive storytelling are influenced by measures of expressive gestures, auditory cues and physiological signals. Recent results from the EU IP Project LIVE will be presented, where a live iTV Video Conductor has created in real-time collaboratively with real as well virtual audience participation an interactive story about the Olympic Games. As next step we want to develop novel computational models of Creative Group Communications for an audience-driven event, where there will be no need for a "Video Conductor" or any professional "Director or Moderator", to enable the attending and remote audience collaboratively to tell collaboratively in real-time interactive stories about live Performing Events.

*Using Physiological Indicators of Emotion as a New Means of Human Computer Interaction*  
*R. Benjamin Knapp, Sonic Arts Research Centre, Queen's University, Belfast*

The Sonic Arts Research Centre is creating the world's largest database of physiological response and self-reported emotional response to music listening. Currently over 4500 people have participated in the study in the UK, Ireland, and Italy. From this data, mappings from physiological response to emotional response are being discovered. Using these mappings, artistic pieces (both music and film) are being created that use physiological interfaces as a new means of interaction. It is argued that the future of new creative industries will be based on this close link between art and science. Both the data collected and its use in artistic creation will be discussed.

<b>SIEMPRE</b>		Page 20 of 20
Deliverable 5.2	PUBLIC	
UniGe-CH (Ed.)	Nov 2010	

## **Appendix III - Proposal of Poster at FET 2011:** *Creative Group Communication and Novel Paradigms for Active Experience of Cultural Content, by Antonio Camurri and Gualtiero Volpe*

Theatre stage and artistic performances (music, dance) – but also other human social activities, such as political ceremonies - aim at joining participants to act together: to share and shape, to mould, co-create cultural content by means of – often highly emotional and aesthetic – active experiences. Future networked and social media technologies should be exploited for promoting new ways of experiencing cultural events and artefacts. Non-verbal social signals, including expressive and empathic behavior, are the main component of future social media characterized by embodiment and physical engagement of users.

The aim of this poster is twofold: (i) to present research results obtained in the in the EU ICT FET SIEMPRE Project, focusing on perspectives on novel interaction paradigms, grounded on the analysis of nonverbal emotional and expressive behaviour, of nonverbal social behaviour in small groups, and on personalised interactive narratives; (ii) to show how some of the specific research results from SIEMPRE are exploited in the proposal of final artistic performance at FET11.

### **The EU ICT FET SIEMPRE Project**

The goal of the SIEMPRE project ([www.infomus.org/siempre](http://www.infomus.org/siempre)) is to develop novel research theoretical and methodological frameworks, computational models, and algorithms for the analysis of creative communication within groups of people. Three aspects of the phenomenon are considered: **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. SIEMPRE studies each at two levels – between performers, and between performer and audience. Entrainment, emotional contagion, and co-creation are investigated in SIEMPRE in scenarios based on artistic performance.

SIEMPRE is also a clear example of cross-fertilisation of artistic and scientific/technological research: we aim at better understanding empathy and non-verbal social signals by means of the languages of the arts, in particular music and dance.

### **Research results demonstrated in the final artistic performance at FET11**

This artistic performance is grounded and exploits scientific results from the SIEMPRE EU FET project. The proposed artistic performance will exploit recent developments on techniques to measure entrainment and leadership in small groups of people, and on techniques to measure expressive content from multimodal signals (audio, gesture, context): such non-verbal expressive and social signals define the relations between the movement of dancers and the real-time processing and moulding of pre-recorded and live music.

The active experience paradigm demonstrated in the artistic performance also shows novel perspectives of future ICT systems for active music listening and active experience of audiovisual content. In more detail, one of the novel contributes that the performance will demonstrate is the possibility by a prosumer to actively experience in personalized and novel ways of generic, pre-recorded music content, according to non-verbal expressive, emotional and social behaviour.