Title	Orchestra violin sections and conductor
Question of interest	Role of visual communication in shaping network dynamics across musicians and conductors
Leaders	IIT
Other SIEMPRE groups involved	UNIGE
Referent scenario	Scenario 2: Orchestra
Research objectives	The main objective is to study non-verbal communication among experts in sensori-motor synchronization such as orchestra musicians. Measures of synchronization and leadership.
Theoretical hypotheses	Movement kinematics can be used to extract the dynamical pattern of communication among orchestra players and conductors
Operational hypotheses	Acceleration profiles of body parts movements can be used to compute causal influences (Granger analysis), information flow (information transfer) and synchrony among musicians and from conductor to musicians. Electromyography of violinists will be used to establish the amount of co-contraction strategies used by musicians associated to the amount of coordination across them and the conductors. Questionnaires will associate the perceived and objective measures of sensori-motor non-verbal communication among the participants.
Relationship with the objectives of the project	This experiment on the orchestra scenario is central to the objectives of SIEMPRE. This will be the final recording for this scenario.
Time schedule	Multimodal data recordings with orchestra of Music Conservatory of Genoa and 3 different conductors was done in March 2012 at UNIGE premises of Casa Paganini. Data analysis is in progress with different techniques.

Methods	
Participants	3 conductors, 8 violinists and 10 instrumentist
Materials	Music materials: Ouverture of "Signor Bruschino", Rossini Vivaldiana, terzo movimento, Malipiero
Data format	SIEMPRE multimodal platform data
Experimental protocol/procedure	The three conductors and the orchestra executed the two pieces in a standard and two additional experimental conditions. The standard condition consisted in a normal orchestra scenario with musicians placed in a conventional spatial position. The two other conditions consisted in playing the pieces with the first violin (first row) section facing the second section (second row) thus avoiding eye contact with the conductor. The second experimental condition consisted in the inclusion of dynamic changes to the pieces (accelerando, diminuendo, etc.). The conductors alone knew what and when the dynamic alteration was going to be applied.
Measures	1) Questionnaires: - BFI questionnaire before the experiment - Post-performance questionnaires to evaluate their ability to play and follow the conductor 2) Kinematic recording: - violinists' bow and head position - conductors's head, left hand and baton 3) Electromyography: - violinists' right biceps and triceps

Results	Successful multimodal recordings of the orchestra of the Music Conservatory of Genoa have been done in March 2012. Significant multimodal data have been identified, segmented, and prepared for data analysis. Data analysis is in progress.