

# Modelling and Analysing Creative Communication within Groups of People: the Artistic Event at FET11

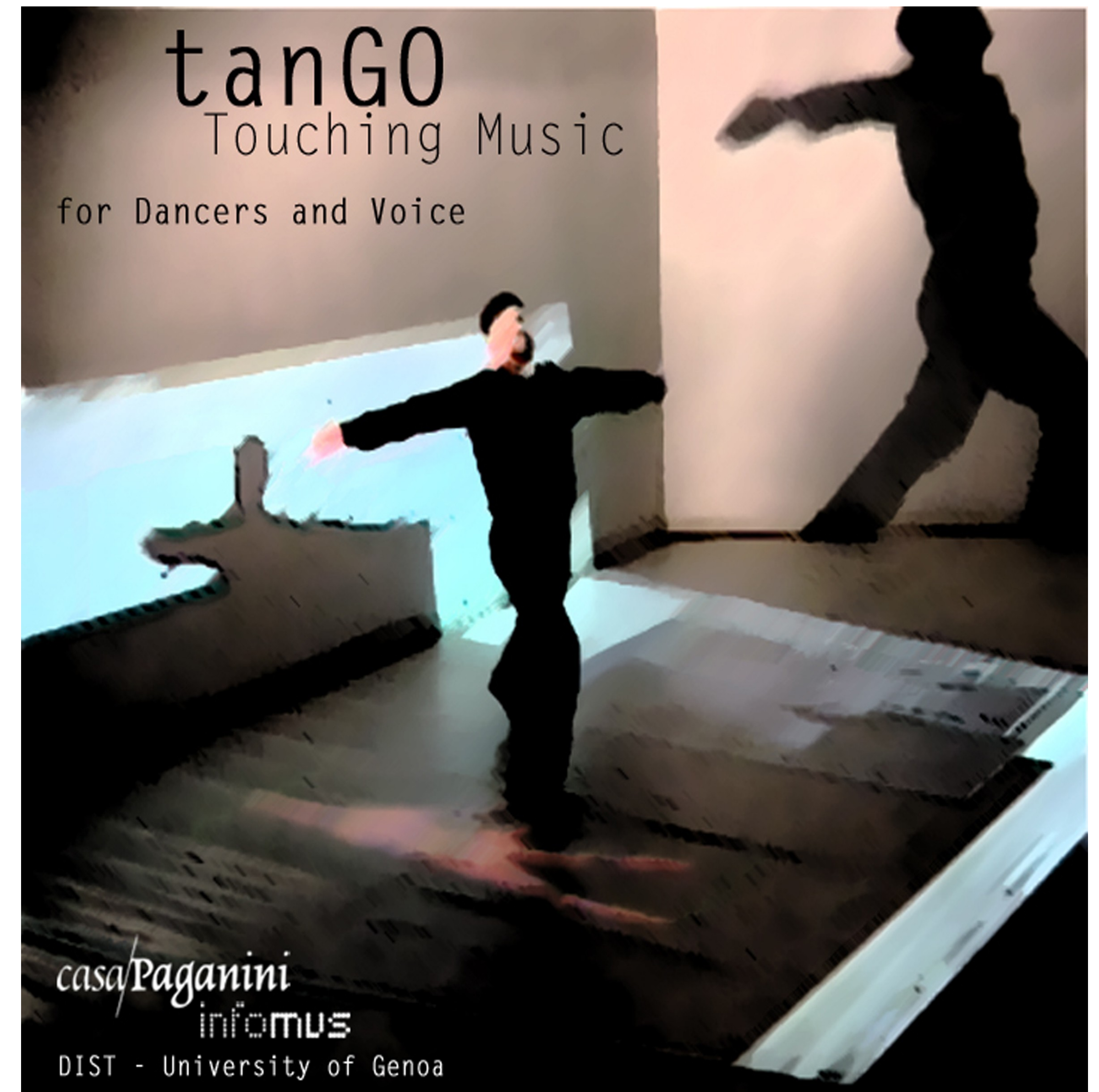
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## Concept and objectives of EU-ICT-FET SIEMPRE

- Theatre stage and artistic performances – but also most of human social activities – aim at joining participants to act together, to share and shape, to mould, and co-create cultural content by means of – often highly emotional and aesthetic – active experiences.
- Non-verbal social signals, including expressive and empathic behaviour, are a major component of future social media characterized by embodiment and physical engagement of users.
- tanGO Touching Music shows the potentialities of recent developments on techniques to measure *synchronisation* and *dominance* in small groups of people (the dancers at the performance), and emotional content from multimodal signals (audio, gesture, context)
- Non-verbal expressive and social signals define the relations between the movement of dancers and the processing and moulding of pre-recorded and live music.
- SIEMPRE develops novel research theoretical and methodological frameworks, computational models, and algorithms for the analysis of creative communication within groups of people.



## Non-verbal social signals

### • Synchronisation

Synchronisation is referred in Physics as a phenomenon occurring when two or many components of a complex system adjust a given property of their motion to a common behaviour, due to coupling or forcing. Our system addresses the synchronisation of affective behaviour in terms of the phase synchronisation of the time-series of the emotional features describing the emotional behaviour of the users.

### • Dominance

Dominance concerns the behavioural and relational control aspects of interaction and entails the ability to influence others. Our approach [1][2] addresses the involvement component of dominance. The objective is to extract a leadership index, based on an analysis of chronemic aspects.

### • How to measure synchronisation and dominance?

Synchronisation is computed using a recurrence-based approach (Synchronisation extraction module). Leadership index is computed with Event Synchronization to measure time delay patterns (Leadership extraction module)[1].



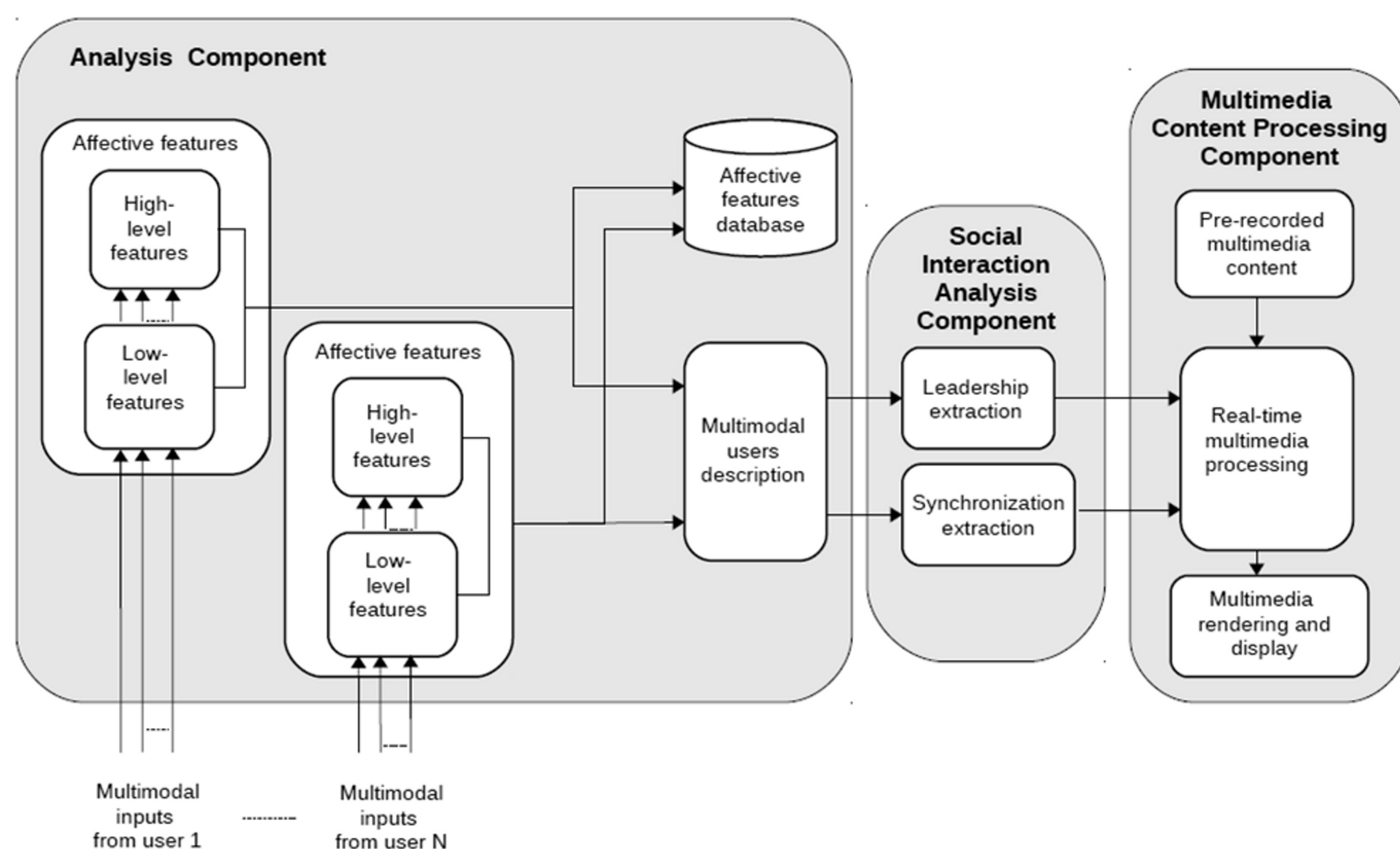
## tanGO – Touching Music

**tango:** latin, verb; “being near to”; entering in a place; touching; “stimulate”; “to be moved” in the sense of affect.

*tanGO – Touching Music* brings on stage scientific research by Casa Paganini – InfoMus in SIEMPRE.

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

In *tanGO - Touching Music*, non-verbal cues on expressive gesture, emotion, and social behavior (synchronisation, dominance) of dancers are extracted to build dynamic interpretations of the tango music.



## Acknowledgements

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## References

- [1] Varni, G., Volpe, G., Camurri, A., 2010. A System for Real-Time Multimodal Analysis of Nonverbal Affective Social Interaction in User-Centric Media. *IEEE Transactions on Multimedia*, Vol.12, No.6, pp.576-590.
- [2] Glowinski, D., Camurri, A., Chiorri, C., Coletta, P., Schenone, A., Volpe G., 2010. Multi-Scale Entropy Analysis of Dominance in Social Creative Activities, *Proceedings of the ACM Multimedia Intl Conference*, Firenze, ACM Press.