

This video shows a performance during the opening night of the International Rostrum of Composers in Conservatoire of Palermo in 2017.

### I.C.A.R.O. Interactive Computer Architecture for Robot and Orchestra

It is an interactive show and research project with an interdisciplinary approach about music, emotions and artificial intelligence.

The research was born as collaboration among the Conservatoire, the University and the Fine Arts Academy.

1. The project is about conveying the audience emotions through humanoid robot gestures to an orchestra during an alive musical exhibition.  
It will be realized through the mixture of electronic and instrumental music, the assistance of artificial intelligence and a synchronized Video-Mapping session.
2. A smartphone application allows the audience to interact with the show that evolves accordingly. Every performance is unique.
3. Russell's Circumflex is a coaxial system and divides the space in four squares. Each square shows an emotion connected to a color. So red means anger, yellow happiness, green quietness and blue sadness. The horizontal axis, from left to right, shows a range from negativity to positivity. The vertical axis, from the bottom to the top, shows the dynamic intensity of the emotion. We can see the location of each emotion.
4. According with the audiences preference, the robot Nao make an interaction with the ensemble through hand gesture.
5. Four scores, related to each color, will be played with different instrumental ensemble to avoid repetitions. In this way will have different combinations as follows : A B C D E
6. Furthermore in the same score will be used a different electronic music. We can see the elements of this electronic music.
7. In the show of 19th October 2017, I.C.A.R.O. had 90 user among the audiences that collected 6053 preferences.
8. This project will increase the audiences by streaming and it can be a good start for future perspectives.
9. In particular, in agreement with Prof. Chella, teaching Robotic engineering at the University of Palermo, with Maestro Betta, supervisor at the Teatro Massimo, and the EMC contemporary music ensemble of the Palermo Conservatory I conduct, we are planning to realized a new project with another more advanced robot. Hopefully it could be staged in the foier of the theatre, next year.

A short trailer will give you more details on I.C.A.R.O.