

## Câmara Neuronal: a Neuro/Visual/Audio Performance

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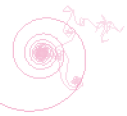
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**Abstract:** *Câmara Neuronal* is a neuro, audio-visual performance. In this project the movement/physical interpretation, as well as mental and sensory interpretation of the performer, are translated, in real time, into sound and visual compositions within an immersive projection environment.

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Computation Communication Aesthetics and X. Bergamo, Italy. [xcoax.org](http://xcoax.org)

## 1. Introduction

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*Câmara Neuronal* is a neuro, audio, visual performance unfolding around the character of the Adolfo Luxúria Canibal, a Portuguese poet and performing artist. In this piece, the movement and physical interpretation, as well as mental state of the performer, are translated into sound and visual compositions within an immersive projection environment, in real time.



Fig. 1. Public presentation of *Câmara Neuronal* at Guimarães European Capital of Culture 2012.

One of the most innovative aspects explored in this project is the close link between the narrative and emotional aspects of the performer, achieved through a neural-physiological signal recording device, Electroencephalogram (EEG) in synchronization with the visual and sound aesthetics. The EEG helmet, from Emotiv Inc, adorned with cables that connect to the ceiling evoke a “brain connection” to the system. The helmet signals are transmitted via wireless to a software trained specifically to the mental states of the artist Adolfo Lúxuria Canibal. The heartbeat of the performer is also acquired in real-time during the performance.

## 2. Project Development and Performance

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The performance, with the duration of 45 minutes, involves a single character on the stage, with his body connected to the visual and audio system. The connections include one EEG helmet, from Emotiv Inc with 16 electrodes and 1 Polar Inc device for heart rate measurement. The body movement is captured through a Microsoft Kinect 3D depth camera. The heart rate is transformed into image and sound by beat detection and transmitted through open sound control protocol. The EEG Emotive system provides a neural network software to train the detection of specific mental states. Through a set of rehearsals the EEG Emotive neural network was trained to respond to a set of mental states of the performer.

## 3. Challenges behind physiological performances

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Through out the piece, there are several moments where the visuals react to the intensity of the neural recordings. While the piece was created and adjusted through a series of approximations and trials conducted during rehearsal, in a real performance the readings from the EEG are necessarily different, as many factors, including the levels of anxiety,

stress, concentration, focus, contribute to changes of the performer's mental state and the EEG readings. The graphical and sound design that was done for a set of signal intensity might work differently from what was originally intended when the intensity of those readings change. So that might cause a change in respect to the aesthetics of the piece and add an "unknown" variable to what the public will see as a final outcome.

Ways that we dealt with that was to rehearse with the performer just a few minutes before the show started, for one.

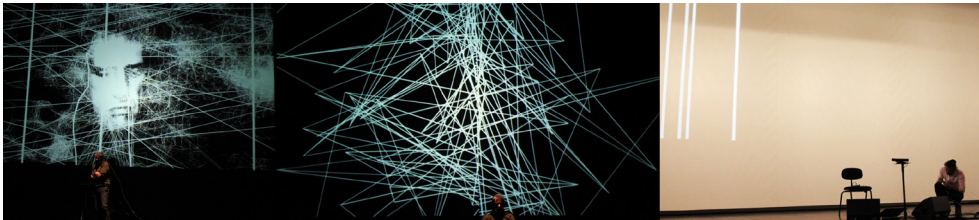


Fig. 2. Presentation and stage tests of *Câmara Neuronal* at Teatro Circo, Braga, 2013.

#### 4. Relevant media assets

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Access to relevant media assets about this artwork at:

<http://camara-neuronal.jmartinho.net>

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