Gira

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1. PROJECT DESCRIPTION

Gira is a music and dance performance with Giromin, a wearable wireless digital instrument. With this Digital Dance and Music Instrument a gesture is transformed into sound by motion sensors and an analog synthesizer. This transmutation of languages allows dance to generate music, which stimulates a new dance in an infinite feedback loop.

This instrument was created inspired by a research with the musical community from the Northeast of Brazil's relationship with their instruments. It was noted how the body expressivity was an issue for musicians both from acoustic instruments as well as for electronic music performers[1]. The intention to create this instrument was to amplify the small gestures of a table-top DJ controller into free space. Together with the first prototypes of this instrument began the composition of this performance as a natural creative consequence.

Fig. 1. Gira Performance Picture

The central concept of Gira is the transcendence of space and time. Spinning around the spinal axis for a long time builds up a trance involving the performer and the audience in this state of space-time suspension. The music and light dialogues with this state, using repetitive loops and circular movements.

The Giromin is sometimes played with a musical intention, searching for specific sounds that naturally create interesting dancing patterns. In other moments the focus is on a dance intention, which produces music that surprises the performer and makes him move differently. These feedback loops between dance and music help to build this transcendence. They represent a loss of

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control along the performance and promotes a connection between the dancer-musician and the audience.

While the dancer-musician defines the timbral and rhythmic space, another performer the more precise controls, with a Pandivá (described below) connected to the same synthesiser. We can consider all the interfaces and synthesiser as a collaborative wirelessly connected instrument. One of the performers is related to the intuitive control (or lack of control), while the other is not interested in performing expressive gestures, but to control the precise timing and note selections.

The relationship between music, sound and lighting are analogous to one another. This gives a strong sense of liveness and a synesthetic experience. In Choreomusicology literature this relationship has been referred as an "Intrinsic mimetic", "sound is movement, movement is sound" and "analogue interactions and direct correspondences between musical rhythm and movement rhythm often referred as 'mickey-mousing'"[2]. These classifications have been created for a context where different performers play music and dance. For a context where there is a dancer-musician these categories are interesting but have different roles.

The analogue connection of the rotation speed of the body around its axis, the tempo of the music, and the rotating speed of the circular alternating flashing LED reflectors to amplify the change of perception of time, suggesting its compression and dilation with the performer's movement. The direct correspondence between the height of the arm, the spectral centroid of the sound and the overall light brightness change the perception of space in a similarly expansive and contractive movement. The analogy between vertical movement and spectral centroid were shown to be common by an experimental procedure[3]. The lowest position of the arm has a low-frequency sound and no light, while the highest position of the arm gives the brightest light and sound.

2. TECHNICAL NOTES

The Giromin Instrument is a set of two (or more) nodes with Magnetic, Angular Rate and Gravity (MARG) wirelessly connected to an analogue synthesiser. On the performance, one node is attached to João Tragtenberg's right upper-arm and another to his torso. The body controls the timbral parameters of the subtractive synthesiser, while the Pandivá Instrument [4] controls the notes by Filipe Calegario.

Fig. 2. Pandivá Instrument

Pandivá is an instrument inspired on the gestures of a trombone and a Brazilian Tambourine from piston-like controllers and 12 buttons grouped in three sections of a circle. The pistons select a set of notes, and each button plays each of the notes from the set. It was designed in a similar way to a guitar, where one hand selects the chords, and the other excites each note of the chord in a rhythmic pattern. Instead of complex guitar finger dispositions, the 4 piston controllers allow 16 different combinations and buttons afford a tambourine rhythmic gesture to play them.

Giromin has a gestural sensing unit that gives out the orientation data from sensor fusion algorithms into angles between the three orientation angles (Euler angles), the absolute accelerometer value, and the gyroscope data of rotation around each axis with a smoothing filter. The mapping was made to have analogue relations between gestures and sounds.

The rotating speed around the spinal axis with a smoothing filter controls the BPM parameter of the arpeggiator, changing the duration of each bar based upon the duration of each whirling movement. This parameter also controls a DMX interface that programs a sequence of PAR LED reflectors placed in a circle around the dancer to light one after the other. The rotating speed also controls the speed of the sequence.

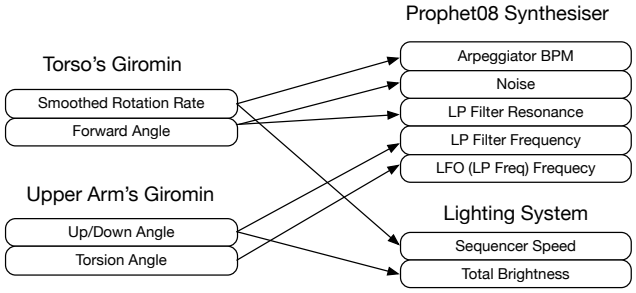

Fig. 3. Giromin mapping strategy

The height of the arm is mapped to the frequency of a low-pass filter and the intensity of the stage lighting. The rotating of the arm around its axis increases

the frequency of a LFO and the forward inclination of the torso increases the resonance parameter of the low-pass filter and increases the amount of noise of the timbre.

3. PROGRAM NOTES

"Gira" is a 15 minutes music and dance performance with Giromin, a wearable digital dance and music instrument that controls the electronic production of sounds from body movement.
The central concept of "Gira" is the transcendence of space and time. Spinning around the spinal axis for a long time provides a trance involving the performer and the audience in this state of space-time suspension. This performance dialogues with this state using repetitive loops, circular movements, closely connected gestures and sounds. The compositions came as much of musical intentions as of dance.

4. MEDIA LINK(S)

- Video: https://www.youtube.com/watch?v=AwQjhSw0phU
- Shorter version: https://www.youtube.com/watch?v=juIXJZ66Vys

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