iCons

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1. PROJECT DESCRIPTION

iCons is an interactive multi-channel music piece for live computer and a gesture sensor system designed by the composer especially for this piece, called *AirTouch*, shown in figure 1. Such system allows a much more musical approach to controlling sounds than the computer keyboard or mouse. Using only movements of the hands in the air it is possible to control most aspects of the music, such as sound shapes in time, loops, space positioning, or create very rich spectral densities. In certain aspects, this device works very similar to a Theremin [1], with the difference that the sound production is totally separated from the control system.

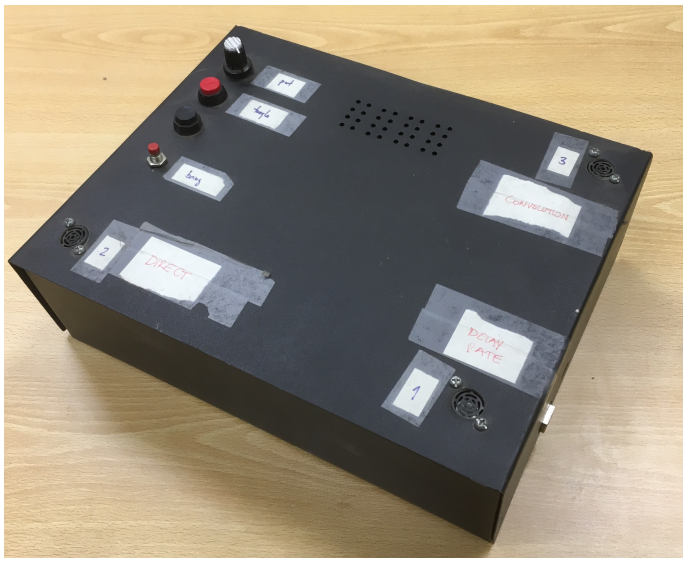

Fig. 1. The AirTouch, instrument especially developed for iCons. This instrument contains three ultrasound distance sensors (labeled 1, 2 and 3 in the picture), a knob, two toggle buttons and a trigger button. The device contains an Arduino board and connects to a computer via a USB port.

2. TECHNICAL NOTES

The instrument *AirTouch* used in *iCons* consists on an Arduino board with three ultrasound distance sensors, one potentiometer, two toggle buttons and one push button. Each of the sensors can sense positions of the hands in the air with relation to the instrument. The positions of the hands in the vertical direction is analyzed by a MaxMSP patch, shown in figure 2, and velocities and accelerations are calculated in order to detect a great variety of hand gestures, as shown in figure 3. The trigger button is used to change sections in the piece and the toggles are used to loop sounds. The knob controls the amount of reverberation and convolution used along the piece.

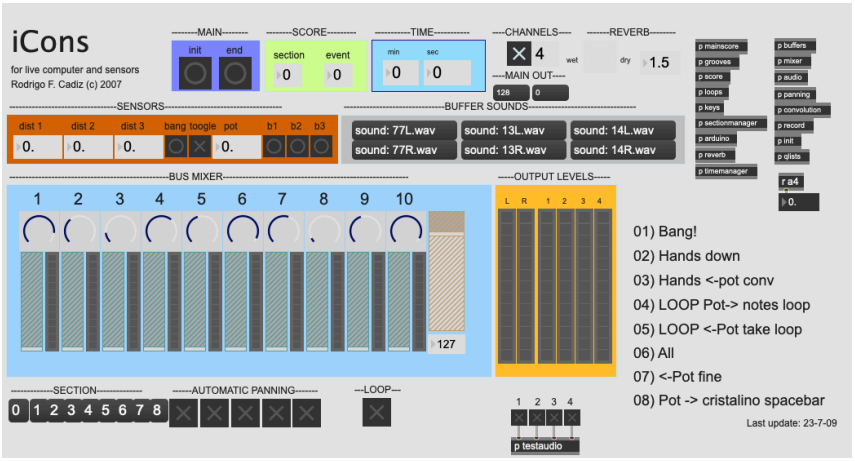

Fig. 2. MaxMSP patch. AirTouch data is displayed in the orange box. The patch also displays sounds currently being triggered, audio output levels, time, and section number. An abbreviated score is displayed in the bottom right corner.

Fig. 3. The composer performing iCons. Gestures of both hands moving in the air are captured by the AirTouch instrument and sent to the computer for further processing. The vertical distance of the hand with relation to the instrument is one the most important measurements used in the piece.

3. PROGRAM NOTES

The piece is based on a single source of sound, a coin, that resonates and interacts with different media. The exhaustive exploration of a single sound source is a common trend in many of my electroacoustic compositions. The sounds produced by the coins are presented, transformed and spatialized live

via several signal processing algorithms controlled by a gesture sensor system designed by the composer. *iCons* is originally a 4-channel piece, but its design allows for 8-channels or a stereo presentation as well. It can be performed live on stage using the sensor system or it can be presented as an acousmatic piece. *iCons* was composed at the facilities of the Center for Research in Audio Technologies at Pontificia Universidad Católica de Chile and premiered at the VII Ai-maako International Electroacoustic Music Festival of Santiago de Chile, in 2007. It was also presented at Silencio 08, Reunión de Compositores, in Santa Fe, Argentina and Electrónica Viva, Santiago, in 2008, at Sound and Music Computing in Porto, Portugal, in 2009 and Sesiones Piso 3 in Santiago in 2010. A stereo version was released as a part of the double CD Unisono, available at CD Baby, Spotify, Apple Music, Google Music and other streaming applications.

4. MEDIA LINK(S)

- Video: https://www.youtube.com/watch?v=-z2uwYiSqHw
- Audio: https://open.spotify.com/track/4LY2uh1szMSuJApBunSJHG

REFERENCES

[1] K. D. Skeldon, L. M. Reid, V. McInally, B. Dougan and C. Fulton. Physics of the Theremin, *Am. J. Phys 66(11),* pp. 945-955, 1998.