

Designing a Musical Instrument from an Audiovisual Perspective

Main Aim

To investigate the connection between audio and visuals with a view to creating a musical (or more strictly, audiovisual) instrument based around this connection.

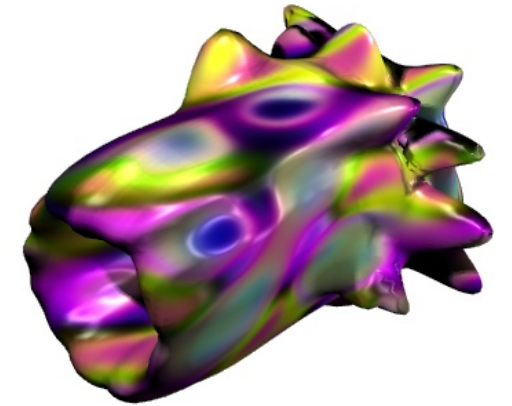
Technology

File Format: X3D¹ will be used as a file format to represent the 3D environment within which the instrument will exist. To this end extensions to the X3D specification are being developed, along with an X3D browser aimed at addressing the specific needs of a real-time audio program (specifically low latency audio operation, and Open Sound Control² support).

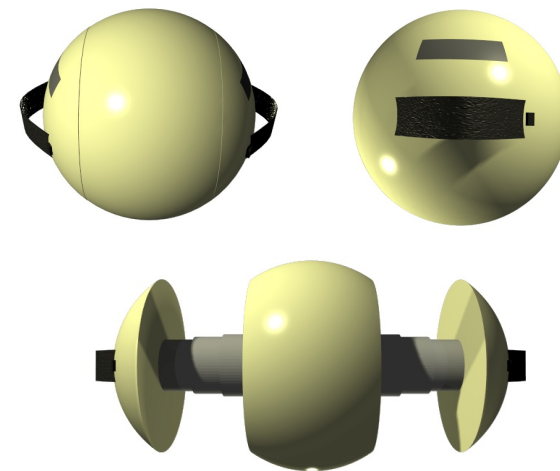
Sound Generation: The instrument's sound generation will be handled by the audio engine to the Tao physical modelling language³, currently being developed to provide better real-time operation.

The Instrument

Design: The instrument is intended to be analogous to a musical block of clay, visually represented as an amorphous 'blob' which may be manipulated the same way that clay is (i.e. you can stretch it, squeeze it, twist it, mould it with your fingers). The intention is that there will be a significant degree of dynamic feedback between the visual and aural aspects of the instrument, with the visual object changing shape, colour etc. in response to the sound output, and vice-versa.



The Audiovisual Connection: All communication between the two domains (sight and sound) will be based around the idea that motion can act as a relatively objective connection between audio and visuals, an idea inspired by Michel Chion's notion of Synchronesis⁴ in film. An example: imagine a film of a pen falling onto a desk. When the pen hits the desk, our experience of the world tells us to expect a corresponding sound of some kind. It turns out that this sound does not have to be the sound of a pen hitting a table for our brain to make a connection between sound and image, as long as there is some kind of similarity between the motion of the pen (or the image) and the motion of the sound (its amplitude envelope, spectrum etc.).



The Interface: The interface is aimed at allowing for the kind of gestures possible when manipulating clay. It allows for stretching (the extendable hemispherical sections), twisting (the hemispherical sections again), and moulding/sculpting (via the grey pressure sensitive touch pads). The interface will be wireless, communicating via bluetooth with an embedded linux box which will convert the raw output to Open Sound Control messages.

1.) <http://www.web3d.org/>

2.) <http://www.cnmat.berkeley.edu/OpenSoundControl/>

3.) <http://taopm.sourceforge.net/>

4.) *Audio-Vision: sound on screen*; Michel Chion; Columbia University Press; 1994

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