

## **Sound Chamber Interactive Art Installation**

by Kynan Tan  
Installation, website and downloadable application

The concept of the Sound Chamber is to create an immersive and interactive digital artwork that can facilitate the communication between a physical installation structure and online interactivity. The project explores a synaesthetic relationship by converting movement directly into audio and visuals.

The following areas of installation art are explored:

- *synaesthetic connections between sound and vision*
- *direct interactivity*
- *internet networking*
- *sound installation art*

The Sound Chamber has developed from an initial idea into a multi-faceted project involving an interactive installation, socially oriented website and downloadable application. Kynan Tan developed the initial idea of closely linking video and sound that occurs in a digital domain, by directly transferring properties that occur in video to properties of sound. The original work was entitled *hypnogenia* and functioned by transferring a video 'score' of abstract digital imagery into sound that responded directly to the movement, colour and density of the shapes on screen. This created a synaesthetic relationship, the images on screen would relate directly to the sound generated, rather than vice-versa as per most widely available visualisation software.

Sound Chamber is primarily a large dome installation. Within a 6m radius inflatable dome, a spherical mirror projection system enables projected images to be shown around the entirety of the dome surface, creating an immersive effect. The spherical dome projection works by reflecting a digital projector using a curved lens, therefore spreading the image around a spherical shape. This is complimented with four-channel surround sound. An Xbox Kinect infrared camera is used to capture movement of participants within the space; the computer then processes this imagery into abstract geometrical projections. This imagery in turn controls the playback of various sound samples.

During the life of an installation, the Sound Chamber dome is connected to the internet and transfers data to and from the online website. A server computer is used, which runs a combination of MaxMSP patches and scripts that allows for the communication with the website. Audio files are downloaded from the server and fed into MaxMSP. The patch generates a short video excerpt using the audio file which is then uploaded back to the website. This is followed by notifications to users that their sound has been processed and a video realization is available on the website.

## MaxMSP computer processing

Two separate chains process the conversion from video to audio. Firstly, the image from the camera is moved to a granular audio engine. Here the size of shapes in the image is detected and the movement, size and position on screen converted to panning, density and rate, with the brightness affecting the overall volume.

Secondly, the complete processed image is passed to a pixel triggered audio sampler, in which the image is downsampled to a 4 x 4 grid, with each pixel's brightness controlling the volume of a particular speed and position of sample playback. In this situation, the colours red, green and blue (RGB) are split between three different samplers. Both audio engines read from three sample buffers.

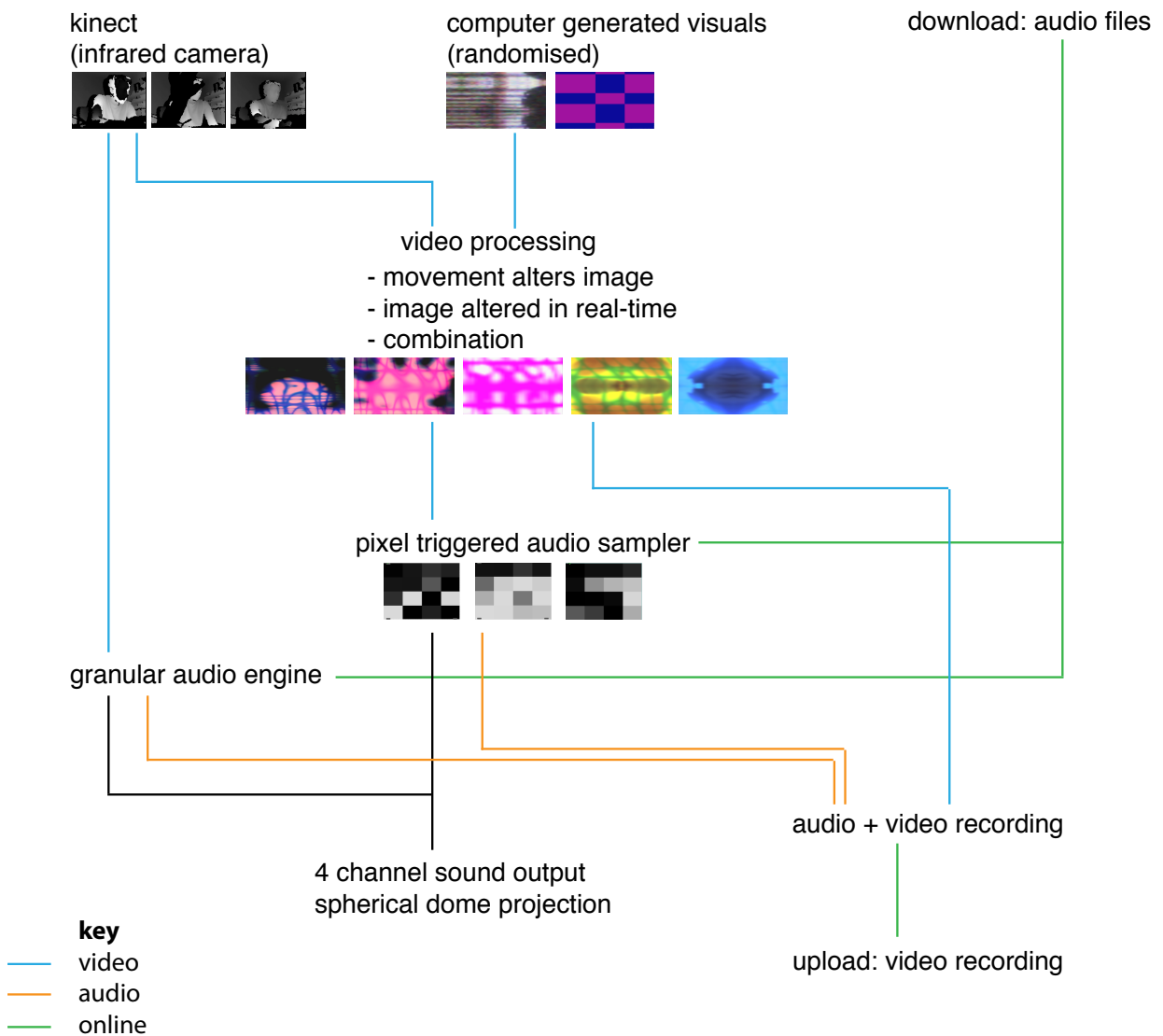


Figure 1 - Flow chart of Sound Chamber patch signal routing

## Physical dome installation

Within the Sound Chamber dome participants move within a small space, their movements controlling 360 degrees of projected images and altering the synthesis of four channel audio. The installation creates a direct connection between participants movement and a full surround sensory experience, allowing users to alter the use of the installation and treat the space as a synaesthetic instrument. The server computer that runs the MaxMSP patch is also responsible for audio download, video upload and all related file conversions. This installation will be installed at the science museum Scitech in Perth, Western Australia in May 2011.

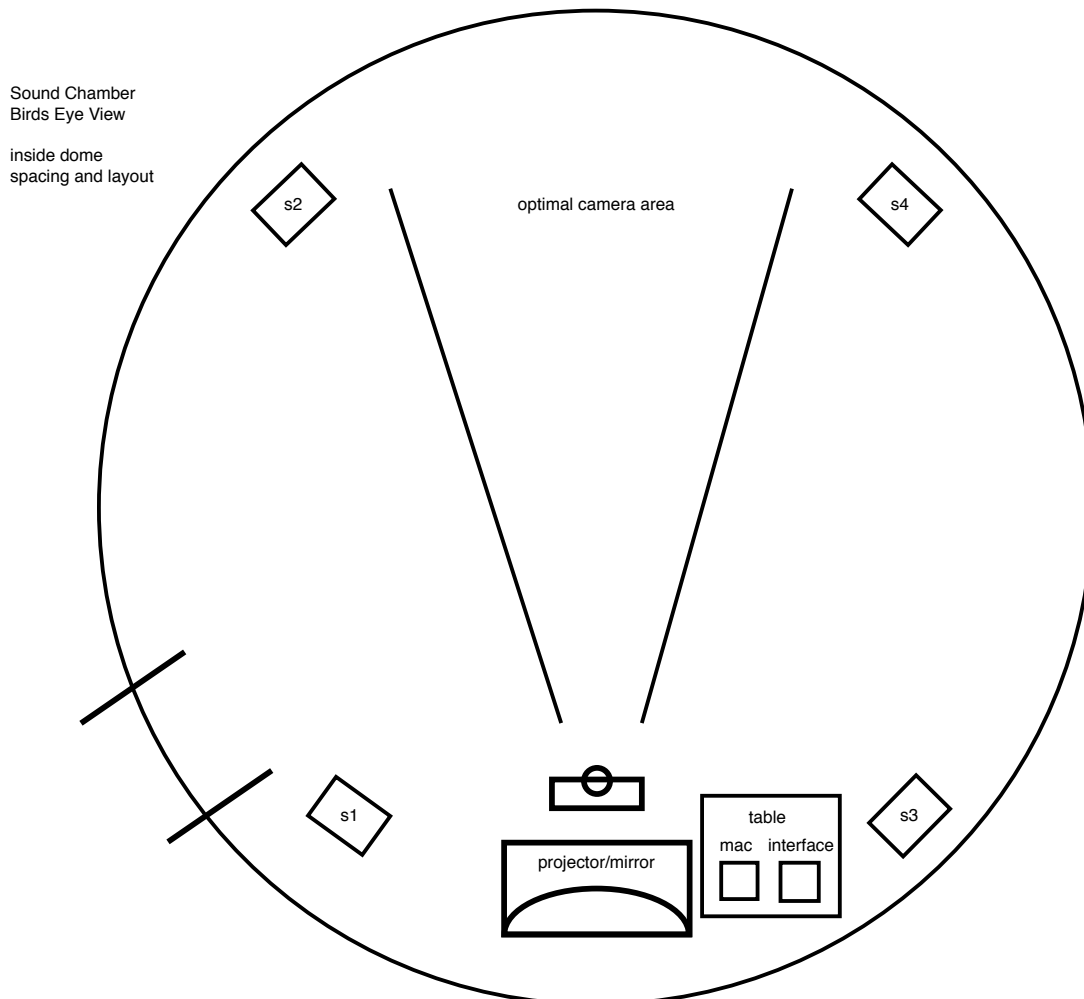


Figure 2 - Bird's eye view of Sound Chamber dome installation spatial arrangement