

Lux Mix is an interactive sound installation that features modulated light as a medium for carrying audio signals. It needs to be installed in a quiet and relatively dimly lit area sheltered from strong artificial lights such as fluorescents. Seven small directional LED lights are arranged around two light detectors (about 20cm diameter hemispherical) mounted on a plain grey façade. The lights point forward into the space, not casting any light on the detectors. Near the entrance to the space is a plinth on which are placed an assortment of mirrors, mirror balls and other reflective objects with a sign describing how these are to be used:

**Lux Mix** is an interactive sound work.

**Warning: This work involves flashing lights.**

There are seven small lights and two white detectors.

To activate sounds, reflect the light back onto the detectors using any of the reflective objects in the space.

Touch, move and play with the reflective surfaces, but **please do not touch or adjust the lights or detectors** and do not bring other lights into the space.

When nobody is interacting with the work it is quiet, sinking into the background noise. When the lights are reflected back onto the detectors, the sounds encoded in those lights are heard through stereo speakers. Each light carries a different kind of sound, all created by non-repeating generative processes. The two detectors direct sounds to the left and right channels. Feedback of these audio signals back to the computer allows sounds to be generated differently depending on levels (and other analysed signal properties) received.

The lights flicker at audio rate, each modulated by a different audio signal. The audio signals are generated in real time by a computer. The two detectors turn audio rate light flickering back into audio signals, which are amplified and sent both directly to a pair of speakers and back to the computer for analysis.

The initial installation of Lux Mix was in the ANU School of Art Foyer Gallery, April 2016 as part of the Random9 exhibition "Light And Dark" (Random9 is an independent art group co-ordinated by Stephanie Parker). One light made magpie sounds if there was more light in the left detector or thrush sounds if there was more light in the right detector. Another light made a frequency sweep up (whoop whoop whoop) if there was more light in the left detector, and a sweep down (tchop tchop tchop) if there was more in the right, and it gradually got faster the more it was active. One light had voices - warmer words or colder words. There were lights for rhythms, melodies and drones, all synchronised and harmonising so you could mix them, and they would randomise when they were silent. The last light was feedback, so you could either make loud honking feedback sounds or you could use it in combination with the others to add a harsher quality.

For the ICAD installation the set of sounds would be reviewed and updated based on experience from the Foyer Gallery installation. For example, people tended to use one sound at a time and would find sounds more engaging if they were clearly able to control it. The sweep sound proved popular because it provided such understandable control. The bird sounds were also popular because they were pleasing sounds, perhaps also because they provided an unexpectedly natural element to the clean interplay of physical signals and processes. The more musical channels lost some impact because they were mostly not mixed with each other, so the relationships between the channels was less clear. Also the difference between the left and right detectors could have been clearer and more meaningful for the musical channels (melodies changed key, rhythms changed density).

The main goals of Lux Mix are:

- to invite play, experimentation, movement and music making

- to spur musing and questioning about the properties and possibilities of light, sound and generative audio.

The act of reflecting light onto a target requires some experimentation to find a light beam and see where it reflects. There is a challenge of dexterity to point the beam back to the detector, which is rewarded by the production of a sound. The continued requirement for dexterity in directing the beam to discover how the sound changes draws attentional focus into the task creating a real experience of playing an instrument in performance, and a conversation between the human operators and the generative processes they are driving.

This work operates on the same principle as “Sound Modulated Light” (2005) by Edwin van der Heide.

[http://www.evdh.net/sound\\_modulated\\_light/](http://www.evdh.net/sound_modulated_light/)

Sound Modulated Light is presented in a dark room with many modulated lights. Visitors each carry a battery powered box that detects light and amplifies it into headphones. Thus each visitor explores the available sounds by moving about the room and pointing their detector toward some combination of the lights. Lux Mix differs from Sound Modulated Light in a few significant ways. Firstly, to interact with Lux Mix, visitors choose from a range of reflective objects, each of which brings its own possibilities and challenges, so there is more to explore and discover in the physical interaction. Secondly, the hand held detectors in Sound Modulated Light do not offer the possibility of feedback, which is what makes Lux Mix more of a conversation than a broadcast. Another key difference is that the sounds in Lux Mix are played through speakers, not headphones, and it can be operated by more than one person at a time, making more of social, conversational medium.

Requirements:

Lux Mix needs to be installed in a quiet and relatively dimly lit area sheltered from strong artificial lights such as fluorescents, as most artificial lights flicker with a loud mains hum. Some leakage of undimmed incandescent lights or sunlight into the space can be less problematic, but the darker the space the better. The physical structure of the work can be adapted to different spaces. For its initial presentation in the ANU Art School Foyer Gallery it was installed in the plinth cupboard on a back plinth with a black backdrop and black fabric draped over the electronics behind the façade. I would expect to rebuild the façade and mounting to suit any new space, given a week or so to construct it. Only one power point is needed. It also requires a plinth about 1m tall to put the collection of reflective objects on.

Attachments:

*Audio Files:*

- Rhythm and Birds Demo.mp3
- Rhythm Demo.mp3
- Sweep Demo.mp3
- Vox Demo.mp3

*Photographs:*

- LuxMix\_bedroom.jpg – photograph of the system at home before the first install.
- LuxMix\_installed.jpg – selfie with the installed system
- LuxMix\_diagram.jpg – rough sketches of the installation with approximate measurements.