Structure of Soundscape

Floor and Screens

The structure if Soundscape is fully portable and working with the constraints of size and mobility we decided to make it as modular as possible. The space needed is approximately 3m x 3m which allows room for the structure, the projectors and mirrors, the operations and sound desk while being able to manoeuvre around the structure.

The four floor separate panels that resembles four sails are clipped together to stop movement of the panels. The floor area in the front of the screens is greater to allow a space for the performers to stand on as well as providing more stability for the whole structure. Yellow duct tape has been placed around the outer edge of the panels to abide with workplace health and safety concerns of having a raised edge to the floor.

The four screens fit into a groove on each their specific floor panel. This groove holds the screen in place in an upright position. It important to be careful with these panels as they house the wiring that connects the flex sensors to the Arduinos. To keep these screens, stable there is a Perspex stand at the rear of the screen and two latches at the bottom of the front of the screen. To provide added stability there is a plate that fits over pegs at the top of each screen.

The Arduinos

The major component that allows the conversations between the sensors and the computer is given a considerable priority and hence, the four Arduino Megas are housed in a purposed built box that allows the ribbon wiring, running from the screens, to be connected via a parallel plug to breadboard and Arduino. Each individual Arduino gains power by being plugged into a powered USB hub that is connected to the computers.

Projectors

The visuals are projected onto the screens by two Epson EH-TW5600 LCD High Definition 3D Home theatre projectors. These are placed at specifically marked positions at the rear of the screens to allow each unit to provide projection onto two screens. A convex safety mirror is positioned in front of the projectors to equally project images onto each screen.

Ableton and max 4 Live

On opening up Ableton it is important to open up both Ableton Live 9 and MAX 4 Live. Ableton manipulates the composition and MAX provides the mapping between Ableton and the Unity.

Check that MAX 4 Live is open by clicking anywhere in the first midi channel. The patching map will show in the mixing panel of the interface. It is important you have the correct Live set (with MAX 4 Live) or the computers will not communicate with each other.

The music can be manipulated manually using the controls on the interface but the project is set up to start when a performer touches any screen.

Unity

When you open the project in Unity, it is important to check the Arduinos are running and reading inputs from the sensors – this check will help trouble shoot any problems and save time later.

Click PLAY – this will bring up two displays for the LEFT and RIGHT sides of the screens.

The displays on the monitors need to be moved to align the touch icons (that provide feedback to the performers) with the sensors on the screens. Sometimes this could mean readjusting the displays as well as the mirrors if there has been a considerable amount of moving of the equipment.

Press P to calibrate the sensor readings. These starting values will vary each time and it is important to level these readings to provide a similar experience in performance each time.

When the performer is ready to interact with the surface Press SPACE BAR. This prevents any accidental starting of the music - this was important with the iPad performance but may not be as important with future performance.

Connecting it all together

Each screen has eight flex sensors that when pressed send analogue readings to the Arduinos. There are four panels (each with eight sensors) so it was essential to use Arduino Megas – one for each.

The Arduinos bundle the readings and send them in a regular pattern via serial communication to Unity on one computer. Communicating via an Ethernet, an OSC (Open Sound Control) is sent to MAX 4 Live.

The mapping in MAX controls the specific signal from each sensor and controls the effects of each sound source created in Ableton Live. The changes in the music are sent back to Unity – connecting from the headphone output, of one computer, to the line input of the other computer.

Signal is then sent via the sound system to the speakers to give us sound and the projectors to create visuals.