Deep Surrender
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Duration: 6 minutes
Instrumentation: Voice, Synthesizer & Responsive Video

Description of the work:

Deep Surrender is a multimedia piece written for soprano, synthesizer, and responsive video. The intention of the piece is to illustrate how an artist can harness anxiety and adrenalin to produce a beautiful performance. This is achieved by utilising the visual metaphor of a jellyfish -- a creature both beautiful and terrifying. The artist's musical performance manipulates the jellyfish representation, in order to convey how the artist interacts with and overcomes her anxiety.

The specially-designed visualization environment used in to perform the piece was developed in Cycling 74’s Max/MSP and Jitter. The visualization maps vocal timbre and chord data to colours. Singing and playing the digital piano allows the musician to manipulate the colours and images in the responsive video stream as the performance develops.

Credits:

Composition and Performance - Robyn Taylor
Audio/Video Processing - Robyn Taylor
Source Video - Melanie Gall
The Deep Surrender Visualization Interface

The visualization interface used to create the Deep Surrender performance illustrates vocal timbre and chord relationships through colour. This mapping between musical feature data and colour was used as a palette for composing the audiovisual parameters of the performance.

Visualizing Vocal Timbre

A sung sound does not consist of simply one frequency. Instead it consists of a fundamental frequency and a series of harmonics or partials that exist at multiples of the fundamental frequency (the first partial exists at two times the fundamental, the second at three times the fundamental, and so on...) The distribution of energy amongst the partials in the sound determine the vowel sound the singer is vocalizing.

In the Deep Surrender visualization, voice is illustrated by visually representing the distribution of energy amongst the partials in the sung sound. This distribution is determined by applying a Fast Fourier Transformation\(^1\) to the live vocal data, and identifying the amplitude of each partial frequency in the analogue input stream.

To map vowel sounds to colours, the first three amplitudes (the amplitudes of the fundamental and the first two partial frequencies) are linked to the inputs of a Max colour-chooser object which takes as its input parameters red, green, and blue colour component values. This results in the generation of an RGB colour value that varies depending upon the weighting of tone amplitude amongst the partials found in the singer's vocal output. Assigning colour in this way yields predictable and repeatable results when a soprano voice (Deep Surrender is a soprano piece) is used as input.

This mapping of timbre to colour allows the performer to interact with aspects of the visualization by modulating the vocal tone she employs.

Visualizing Chord Relationships

To visualize the relationships between chords, the chords are related to one another with regards to their positions on the music theoretical device, The Circle of Fifths. To define the relationship between chords and colours, the Circle of Fifths was mapped to the standard colour wheel, making chords that are similar to one another on the Circle similar in colour\(^2\).


Artistic Summary

*Deep Surrender explores an artist’s relationship with fear and adrenalin. As the artist learns to control and collaborate with her fear, the visualization develops greater complexity and beauty.*

Part One

In Part One, the artist is merely an observer of the fearful environment. The visualization is simple, with the artist controlling only the basic colour balance of the image by playing simple chord progressions.

Part Two

In Part Two, the artist begins to experiment. She uses her voice to introduce entities to the visual environment, and realizes that her actions elicit a colourful response from the ominous creatures.

Part Three

In Part Three, the artist realizes that the most beautiful results are produced when she combines her voice with the fearful imagery. The visual effects flourish through her willingness to overcome her hesitation and thrive upon the adrenalin rush of fear.
Audio-Visual Documentation:

To view a video of the performance, please visit
http://www.cs.ualberta.ca/~robyn/DeepSurrender.mp4
Set-up and Rehearsal:

To set up the performance, a synthesizer and audience-viewable display (projection screen or large monitor) must be set up on stage, and connected to the laptop running Max/MSP/Jitter.

In rehearsal, the system must be tested in the space so that the responsivity of the application can be adjusted to match the sound levels in the room.

Technical Requirements:

Requirements:
- Keyboard, microphone, tripod mic stand
- Desk for laptop computer
- Large screen or projection display (for the audience to view)
- Sound system to amplify synthesizer and voice

When performing this piece, the singer sits at the keyboard, facing the audience. She must watch the visualization on her own laptop monitor (so that she can receive visual feedback from the application) but a large screen should be behind her so that the audience may view the visualization.

Technical Set-up Diagram: