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Hack A Band Song "God's Given Up On Him"

Advanced Audiovisual Processing Project Report

Intro

I am in a band "Small Engine Repair" and we are releasing an album on Jan 27th 2014, one track off it "God's Given Up On Him" is an odd spoken word track that invites a different musical approach for the listener. Through DSP processes I wanted to mirror this in an interactive and very visual way.

Aims

Creating the functionality to reshape and mound the sound and audio was a key consideration when building the project, being able to "Hack" in and alter various attributes. The overall look needed to be moody and dark with multiple visual and auditory layers to build a new artistic output upon each playing.
To achieve these ideas I implemented live audio and video input as well as lighting effects.

DSP Processes

For brevity I will mention only the key DSP processes I have made use of in the project and they are summarized as seen below.

- **Audio Filtering**: Taking the audio input and dividing up the frequency range into 4 bands Low, LowMid, HiMid, and Hi. Each of these is used to manipulate 3D spheres, cubes and cylinders and lights being drawn to screen.

- **Spectral Analysis and Resynthesis:** There are options via FFT to alter the audio by taking the magnitudes and phases of the song with a second ambient track creating interesting filtered effects that through IFFT are output. A version of MFFT is also implemented.

- **Musical Interaction and Video Filtering:** With a basic Pitch Tracker the user can either sing or play an acoustic instrument along with the track. All input is taken via FFTs creating an array of estimated pitches which all interact with the image filters, altering the pixel data of a videoGrabber and the x, y positions of various visuals. (An interesting note is that if the track plays out over speakers then a feedback loop is created where the audio from the track loops round and back in manipulating the output.)

For more information on the processes please see the source code as it is heavily commented to explain many more examples of DSP interacting with the various components.