

MUST 382 / EELE 491

Spring 2014

Class project ideas

(1) Effects box or guitar pedal

Design and implement a set of at least three different analog signal processing circuits for use as guitar or vocal effects. Examples include clipper, fuzz, tremolo, bandpass filter, etc. The system needs a power source, standard connectors, switches, and so forth.

(2) Headphone amplifier

Investigate the design and construction of a circuit capable of driving one or more audio headphones. Select and build a suitable amplifier design, including switches, level controls, and standard audio connectors.

(3) Microphone preamplifier with phantom power

Design and construct a circuit capable of amplifying a professional condenser microphone input signal, including providing +48V DC phantom power. The preamp should have a gain trim, signal present and signal clip LEDs, and produce a line-level output signal.

(4) “sensor”-to-sound or MIDI

Design and implement a circuit that take some sort of biological sensor input (temperature, pressure, skin resistivity, heart rate, blood alcohol content, etc.) and creates a proportional sound and/or MIDI signal to trigger a synthesizer.

(5) Interactive light/sound system

Design and implement a system with a microphone input containing filters and level detectors to trigger LEDs (or other lights) based on the loudness and spectral balance of sounds picked up by the microphone. The circuit could be implemented as a control box or as a wearable jewelry item.

(6) Audio-to-laser display

Design and implement a simple “laser light show” using a laser pointer and vibrating mirrors controlled by an audio signal.

(7) Theremin or similar coupled oscillator signal generator

Study the principles and basic circuitry of the Theremin, and construct a working oscillator system using these principles.

(8) Talk box

Design and build a “talk box” effects unit, including an enclosed speaker driver, air tube, and on/off switch. The talk box should be demonstrated using a guitar or keyboard sound source input.

(9) Some other proposed idea—would need to discuss.