Chapter 15. Meeting 15, Discussion and Workshop

15.1. Announcements

• Due Today: Music Technology Case Study Draft

• Due Thursday, 12 November: Sonic System project Draft
  Bring prototypes, sketches, ideas to class for discussion

15.2. Quiz Review

• ?

15.3. Reading: Collins


• What is technological constraint, and is it like determinism?

• What does it mean to “aestheticize” technical limitations?

• Collins divides dynamic music into interactive and adaptive: what is the difference?

• What were some of the features and constraints of the NES sound chip?

• Collins writes about the influence of social constraints on the development of 8 bit game music: what were these social constraints?

• Collins writes that, in the context of musical features such as loops and repetitions, “the game’s audio aesthetic was chosen as much as determined...”; why does she make this distinction?

• What are some of the approaches to looping Collin’s describes?

15.4. Workshop: A Basic Synthesizer: Envelope

• Apply an AR envelope to a Saw wave with fixed pitch
15.5. Workshop: A Basic Synthesizer: Looping Pitches

- Loop through a list of MIDI pitches with [mgListLoop]
15.6. Workshop: A Basic Synthesizer: Mixing Oscillators

- Combine oscillators with different waveshapes in different octaves and tunings
15.7. Workshop: A Basic Synthesizer: Signal Pitch Control

- Convert the MIDI pitch value to a signal and low-pass filter [lop~ 20] to smooth transitions
15.8. Workshop: A Basic Synthesizer: LPF Envelope Modulation

- Modulate the cutoff frequency of the low pass filter [moog] with an AR envelope
15.9. Workshop: A Basic Synthesizer: LPF Modulation with LFO

- Modulate the cutoff frequency of the low pass filter with a sine wave \([\text{osc} \sim 0.15]\)
15.10. Workshop: A Basic Synthesizer: AM Tremolo

• Modulate the amplitude between 0 and 1 below the audio rate
15.11. Workshop: A Basic Synthesizer: Ring Modulation

- Modulate the amplitude between -1 and 1 above the audio rate
15.12. Workshop: A Basic Synthesizer: Vibrato

- Modulate the oscillator frequency between -0.1 and 0.1 MIDI steps at a slow rate (6 Hz)

- Modulate the oscillator frequency between -4 and 4 MIDI steps at a fast rate (40 Hz)

- Use a low-pass filtered noise for a percussion sound
15.15. Hardware Hacking: Oscillator Clock Controlled Sequencer

- 74C14 Oscillator (Collins 2009, p. 135)
- CD4017: decade counter, providing 10 output voltages at rate determined by a clock (Collins 2009, p. 208)

Cycle lengths can be altered by connecting an output to the reset input
Figure 23.9
CD4017 pinout.

Figure 23.10
Simple 4017 LED sequencer.
• CD4046: Voltage controlled oscillator (capable of pitch tracking) (Collins 2009, p. 204)
• VCO driven by voltages of the CD4017 (Collins 2009, p. 209)
• Alternative examples

YouTube (http://www.youtube.com/watch?v=FqWzJt3Nm-U)
15.16. Workshop: A Basic Synthesizer: Sequencer Pitch Control

- Counter controlled selection between 8 different MIDI pitch values

15.17. Workshop: A Basic Synthesizer: Sequencer Pitch and Rhythm Control

- Apply event triggers to pitched sequencer value selection and rhythm amplitude list loop

  Selecting triggers from a counter provides rhythmic subdivisions
15.18. Workshop: A Basic Synthesizer: Sequencer Control with SAH Random LPF Modulation

- Use noise through a SAH to produce random LPF cutoff frequencies applied to noise
15.19. Listening: Vaggione


- Contemporary electro-acoustic music employing approaches to sample layering, transformation, and micro-organization (micromontage and granular synthesis)
21M.380 Music and Technology (Contemporary History and Aesthetics)
Fall 2009

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