INSTITUTE OF SONOLOGY

Royal Conservatoire The Hague

Shaping

Programming and Music
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Exercises

```
(
NF(\iop, {|freq=78, mul=1.0, add=0.0|
    var noise = LFNoise1.ar(0.001).range(freq, freq + (freq * 0.1));
    var osc = SinOsc.ar([noise, noise * 1.04, noise * 1.02, noise * 1.08],0,0.2);
    var out = DFM1.ar(osc,freq*4,SinOsc.kr(0.01).range(0.92,1.05),1,0,0.005,0.7);
    HPF.ar(out, 40)
}).play;
)

(
NF(\dsc, {|freq = 1080|
    HPF.ar(
        BBandStop.ar(Saw.ar(LFNoise1.ar([19,12]).range(freq,freq*2), 0.2).excess(
        SinOsc.ar( [freq + 6, freq + 4, freq + 2, freq + 8])),
        LFNoise1.ar([12,14,10]).range(100,900),
        SinOsc.ar(20).range(9,11)
    ), 80)
    ;
}).play;
)
```

```
var <>pindex, <>cindex;

initialize {
    if(pindex.isNil, { pindex = 1000 });
    if(cindex.isNil, { cindex = 2000 });
}

clearProcessSlots {
    pindex = 1000;
    (this.pindex - 1000).do{|i| this[this.pindex+i] = nil; }
}

clearOrInit {|clear=true|
    if(clear == true, { this.clearProcessSlots() }, { this.initialize() });
}

transform {|process, index|
    if(index.isNil && pindex.isNil, {
        this.initialize();
    });

    pindex = pindex + 1;
    this[pindex] = \filter -> process;
}

control {|process, index|
    var i = index;

    if(i.isNil, {
        this.initialize();
        cindex = cindex + 1;
        i = cindex;
    });

    this[i] = \pset -> process;
}
```

```
(
NF(\depfm, {|freqMin=5, freqMax=20, mul=20, add=80, rate=0.5, modFreq=2100, index=0.3, amp=0.2|
    var trig, seq, freq;
    trig = Dust.kr(rate);
    seq = Diwhite(freqMin, freqMax, inf).midicps;
    freq = Demand.kr(trig, 0, seq);
    HPF.ar(PMOsc.ar(LFCub.kr([freq, freq/2, freq/3, freq/4], 0, mul, add),
    LFNoise1.ar(0.3).range(modFreq,modFreq*2), index) * amp, 50)
}).play;
)
```

Exercises

Exercise 1: Lag for Smooth Transitions

Create a patch where a sawtooth oscillator's frequency jumps randomly between values (use LFNoise0), then apply Lag to smooth out the transitions. Compare the sound with and without Lag.

Exercise 2: Sample and Hold Melody

Create a simple melody using sample and hold (Latch or TRand). Use a trigger rate of 4-8 Hz.

Exercise 3: Waveshaping Comparison

Create three versions of the same sine wave (200 Hz) then apply clip2, fold2, and wrap2 to each version. Listen to the differences in timbre.

Exercises

Exercise 4: Lo-Fi Effect

Create a lo-fi/bitcrusher effect by combining sample rate reduction (using Latch) and bit depth reduction (using round). Apply this to a sawtooth or complex waveform. Use MouseX and MouseY to control the parameters.

Exercise 5: Complex Shaping Chain

Create a patch that combines at least three different shaping techniques:

- Start with a complex source (multiple oscillators or filtered noise)
- Apply Lag or VarLag for smoothing
- Add waveshaping (fold, clip, or wrap)
- Include sample and hold or quantization