21M.380 Music and Technology
Sound Design

Lecture №16
Waveshaping and wavetable synthesis

Monday, April 4, 2016

1 Review EX2

- Why do some examples sound like a spinning fan?
- Because a resonating pipe, by contrast to a fan, does not start to resonate at 0Hz or go back to 0Hz!
- Some good-sounding examples

2 Preview FP1 presentations

3 Mini feedback

4 Nonlinear synthesis

- Waveshaping
- Chebyshev Polynomials

5 Wavetable synthesis

- Table objects in Pd
  - Why 4-point interpolation (smoother playback at lower speeds)
  - `[tabosc4~]` vs. `[phasor~]` + `[tabread4~]`
- Equivalence of waveshaping and wavetable synthesis
  - Waveshaping: Periodic waveform (perhaps a sine) passed through nonlinear function
  - Wavetable synthesis: Phasor (fixed) indexes (potentially dynamically changing) periodic function
- Static sounds only → Change table (contents) on the fly
- But how to prevent clicks? → Write behind phasor index or crossfade between different tables
- Vector synthesis (demo with Pd extended)
- Wavescanning

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