21M.380 Music and Technology
Sound Design

Reading assignment 10 (rd10)
Granular synthesis

Due: Monday, April 25, 2016, noon
Submit to: MIT Learning Modules ▸ Assignments
0.5% of total grade

1 Materials to study

Farnell, Andy (2010). "Technique 5. Grains." In: *Designing Sound*.
  Cambridge, MA and London: MIT Press. Chap. 21, pp. 305–14.
  isbn: 978-0-262-01441-0. mit library: 001782567. Hardcopy and
  electronic resource.

2 Required preparation

For your written response to this reading, you will need to down-
load the Pd code examples that accompany Farnell's book, which
are available at http://mitpress.mit.edu/sites/default/files/
titles/content/ds_pd_examples.tar.gz.
    Try the Pd patch from figure 21.8 (which you find in the un-
packed code tarball under ⌂ PUREDATA ▸ TECHNIQUE ▸ timestretch1.pd
on your own machine). Load a mono sound file via the GUI bang
that feeds [openpanel], turn on the DSP, and trigger the top right
[bang(message, which should play the sound you have loaded.
Now, adjust the pitch slider and re-trigger playback. Finally, adjust
the speed slider and re-trigger playback.

3 Questions to respond to

1. How does the sound change as you adjust the pitch and speed
   sliders? How does the result sound different from the sim-
   pler technique of reading a wavetable at various speeds via
   [tabread4~]? As an example for the latter technique, you can
   try a fun 'turntable scratch machine' from Pd's internal help sys-
   tem: Help ⟩⟩ Browser… ⟩⟩ Pure Data ⟩⟩ 3.audio.examples ⟩⟩ B07.sampler.pd .
   In that patch, set the dB number box at the bottom to, say, 90,
   and then drag the value in the number box on top of the patch
   up and down at various speeds.

2. What other practical applications besides time stretching and pitch shifting are there for granular synthesis?

4 Guidelines

- Your answers need not be very extensive (a short paragraph per question is enough), but they should demonstrate that you have actually read the article and understood its main points.

- Try to be concise and pay attention to form, grammar, spelling, etc.

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