

21M.380 MUSIC AND TECHNOLOGY

SOUND DESIGN

READING ASSIGNMENT 8 (RD8)

WAVESHAPING AND WAVETABLE SYNTHESIS

DUE: MONDAY, APRIL 4, 2016, NOON
SUBMIT TO: MIT LEARNING MODULES ▶ ASSIGNMENTS
0.5% OF TOTAL GRADE

1 Materials to study

- Farnell, Andy (2010a). "Technique 2. Tables." In: *Designing Sound*. Cambridge, MA and London: MIT Press. Chap. 18, pp. 277–81. ISBN: 978-0-262-01441-0. MIT LIBRARY: [001782567](#). Hardcopy and electronic resource.
- (2010b). "Technique 3. Nonlinear functions." In: *Designing Sound*. Cambridge, MA and London: MIT Press. Chap. 19, pp. 283–89. 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 install *Pd extended* (as opposed to Pd vanilla) from <http://puredata.info/downloads/pd-extended>. Also, you will need to download 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.

3 Questions to respond to

1. Try the Pd patch from figure 18.3 (which you find in the unpacked code tarball under `☰ PUREDATA ▶ TECHNIQUE ▶ vector1 .pd` on your own machine). Note that this patch requires Pd extended rather than Pd vanilla. You should hear sound after turning on the DSP and adjusting the frequency control in the top right corner of the patch. Once you have sound, try dragging the little ball around the square grid on the left. Describe how the sound changes as a result using professional terminology (e.g., pitch, timbre, etc.). How can your sonic experience

be explained in terms of what you have read about wavetable synthesis?

2. Now try the Pd patch from figure 19.2 in the book (which you find in the unpacked code tarball under `☐ PUREDATA ▸ TECHNIQUE ▸ shaper-sound.pd`), for which Pd vanilla is sufficient. You should hear sound after turning on the DSP and triggering the `[1, 0 60<` message in the top left area of the patch. Now try to manually re-draw the xfer waveshaping function with the mouse (which only works in run mode, not edit mode). How does the sound change as a result, and how does this relate to what you have read about waveshaping? What would the function need to look like in order for it to not affect the resulting sound at all?

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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