A Noise-Based Curriculum for Technological Fluency

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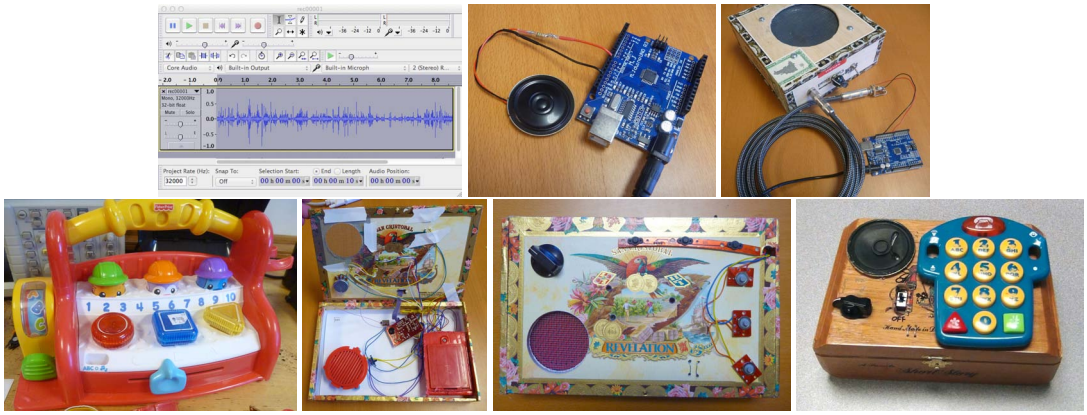

Figure 1: *Examples from a technological fluency class based on noise-making and circuit-bending. Top row: An audio waveform in Audacity of electromagnetic (EM) noise recorded with an inductive pickup, an Arduino microcontroller with small speaker, an Arduino connected to a cigar-box amplifier. Bottom row: A noise making toy purchased at a thrift store, the "guts" of the toy reassembled into a cigar box, the outside of the resulting "bent" circuit , another "bent" toy assembled in a cigar box.*

1 Abstract

General education curricula at many universities require students to take courses in wide ranging areas outside of their specific majors. Conspicuously missing from many of these curricula, however, are engineering and technology courses. As part of a program sponsored by our Office of Undergraduate Studies at the University of Utah, I am developing and delivering a new course that uses the notion of *technological fluency* [2002] as a starting point for a conversation about the role of technology and engineering in a general education curriculum. To position the course as an interesting choice for a wide variety of undergraduate students, I am developing the course to specifically introduce technological ideas through arts and music projects. Essentially this is a way to introduce students to computing and increase their technological fluency but through digital media projects rather than engineering projects. It is also a way to expand students' ideas about technology in the arts and how arts and technology interact in our modern world.

One higher level goal of the project is to expand significantly the dialog related to the intersection of arts and technology, and how *creative design thinking* and *engineering problem solving* are complementary skills that all students need [2011]. I hope it will also serve as a catalyst for additional cross-disciplinary collaborations. The course is called *Making Noise: Sound Art and Digital Media.* It is listed under Undergraduate Studies as UGS2050, a lower division semester length course [2015].

The course is project-based and includes the following components:

- Reading and listening assignments for context.
- Electromagnetic field recordings with inductive pickups.
- Program-based sound generation with Arduino.
- "Circuit bending" by re-purposing noise-making toys and modifying the electronics to make new sounds [2005].
- Simple audio oscillator circuits using Schmitt-trigger-based components [2009].

For their final project (3 weeks) the students use materials developed in the previous assignments in a project of their choice. Project ideas range from more involved hacking on toys, to electronic music compositions using the sound clips collected during the semester, to site-specific sound-art installations, to large assemblages of custom oscillator circuits, perhaps used as a live-performance instrument. The students propose their own final project either singly or in small teams, and the final projects are presented in public demonstration at the end of the semester.

References

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