

Algorithmic Composition

New York University: Interactive Telecommunications Program

Fall, 2007 -- H79.2524

Your class meets on:

Thursdays, 3:30-6:00 PM

In

Room 447

And your instructor is:

R. Luke DuBois

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phone: 212-854-9266 (Computer Music Center, Columbia University)

Introduction

Hi there. *Algorithmic Composition* is a production class aimed at getting everyone generating music using algorithmic procedures. This is to serve two purposes: first, to get everyone used to the idea that music is a highly *procedural* art form that can be used to expressively present a dense amount of information in a pleasing way; second, the course aims to provide a fun and stimulating excuse (making music) to learn more about designing and implementing algorithms in both physical practice and procedural code. We'll be looking at examples of algorithmic thinking in music dating from the distant past to the present, both in pre-compositional and performance situations, listening to as much repertoire as we can. Along the way we'll look at and learn to implement a wide variety of algorithmic techniques.

Prerequisites / Software

This class assumes no specific knowledge of music theory and musicianship, Western or non-Western; along the way we'll learn just enough music theory to make ourselves dangerous. However, as a production class it's extremely useful if you've had some basic exposure to MIDI, digital sound, and some of the software tools that exist for manipulating sound and music on the computer. We'll look at our class exercises using a wide variety of musical tools, but most of our procedural programming will be done in the Processing environment, using it to write instructions for a computer music language called Csound. We'll also look at some examples of real-time compositional interaction in ChuckK and Max/MSP.

Texts / Resources

In order to save everyone the time and money of books and whatnot, I'll be scanning a few readings, as well as posting links to articles and whatever code we use in class on the course website:

<http://itp.nyu.edu/~rd64/ac>

In addition, we have both a discussion list for the class (**itp-ac**). I'll show everyone how to sign up as soon as I have the list configured and the class roster is finalized.

Assignments and Grades

For this class I'd like everyone to create a number of short musical studies as part of the journey towards a final piece of a few minutes duration. Your final piece can be a tape work (i.e. we play it off of a CD), a generative piece (we run a computer program that plays it) or an interactive work that requires user input (from a musician or otherwise) to run. Whatever the case, there will be a class performance at the end of the semester at a gallery location in New York where we can all play our final pieces for each other and our friends. As a result, the work breakdown for the class is as follows:

- Everyone needs to show up and participate in class. (30%)
- Everyone needs to complete three out of the twelve-or-so weekly 'meditations' which I will post to the web site starting the third week of class. These sketches are simple conceptual assignments involving work with algorithmic composition. (20%)
- I'd like everyone to keep an online journal/blog/wiki/whatever containing information about their final project goals and progress as it emerges. (20%)
- Everyone needs to create a final project in the form of a musical work that can be played/ran/performed in front of an audience. Everyone will be expected to participate in a mid-term critique as well as a group performance / show at the end of the term. Group work is welcome as is the integration of your work into projects for other classes / your thesis / etc, though for the class performance a more scaled-down execution of the work that concentrates on the musical aspect may be necessary. If you work in a group please remember that everyone in the group will receive the same grade; I will not attempt to discern any difference in contribution among the members of a group. (30%)

Class Schedule

This schedule is subject to change depending on the interests and pace of the class, etc. In addition, three guest speakers will come in and talk about their work to the class; which specific class they appear on depends on their scheduling and availability.

Class 1: The problem of perception. The problem of mapping. An overview of the class and the history and repertoire of procedural composition.

Class 2: Indeterminacy and aleatoric music. Dice games and the legacy of divination theory. Introduction to procedural programming for classical CM languages (Csound).

Class 3: Stochastic music and probability systems. Random distributions and Markov chains.

Class 4: Data mining. The world as your noise source.

Class 5: Rule-based composition. Generative (process) music, automata, and formal grammars.

Class 6: Guest speaker.

Class 7: Midterm critique / discussion.

Class 8: Equation-mining and iterative functions. Playing with real-time systems.

Class 9: Guest speaker.

Class 10: Neural nets and genetic algorithms.

Class 11: Mapping for synthesis, sound collage, and signal processing.

Class 12: Mapping for interactive works. Machine musicianship.

Class 13: Guest speaker. Private meetings.

Class 14: Final critique and preparations for performance.

CLASS FINAL PERFORMANCE TBA!!!

Enjoy the class!