

## Project #2 Programming

Due: Wed., Nov. 3, 11:59 pm

CHOOSE ONE of the following project options to execute:

1. Create randomly-generated GM drums
2. Create randomly-generated GM music
3. Create five original complex tones using additive synthesis
4. Create five original tones using FM synthesis
5. Other Max/MSP programming project (with instructor permission)

---

### MIDI

---

1. Starting with the template file: “GM\_Drums\_Template.maxpat”

Create a *generative music* application that generates an interesting drum beat using randomly selected General MIDI (GM) drum sounds. In order to make your beat original, you must change (at least) the drum kit instrument selections, tempo, and weighted-random duration selections.

2. Starting with the template file: “Four\_Channel\_GM\_Template.maxpat”<sup>1</sup>

Create a generative music application that creates interesting multitimbral GM music using randomly selected MIDI pitches, velocities, durations, etc.

For both of these project options, you are encouraged to:

- Design an attractive *human interface* for your patcher; e.g. add text (c), colorize objects (Object > Color), add **slider/dial** objects, add colored **panel** objects, etc.
- Extend the program in any way you like.

---

### AUDIO (MSP)

---

3. Starting with the template file: MSP Synthesis Tutorial 1,<sup>2</sup> or “Additive\_Synthesis.maxpat”

Create five original *complex sounds* (1-5) using *additive synthesis* that match the following *partial relationships*:

- Sound 1.** Harmonic
- Sound 2.** Nearly harmonic
- Sound 3.** Inharmonic
- Sound 4.** Closely-spaced partials that produce beating
- Sound 5.** Whatever you want (give it a descriptive name in your paper)

4. Starting with the template file: MSP Synthesis Tutorial 5,<sup>3</sup> or “FM\_Synthesis.maxpat”

Create five original *FM sounds* (1-5) using *FM synthesis* (1-5) that are very different in quality. Be sure to:

- Experiment with wildly different values for the *carrier frequency* and *harmonicity ratio* ( $f_m/f_c$ )
- Experiment with different *amplitude envelopes* and *durations*
- Change the *modulation index* over time to create a dynamic *timbre* (i.e., this controls how the spectral components evolve over time)

For both of these project options, you are encouraged to:

All five FM sounds should be very different in quality. In your paper, each sound (1-5) must be assigned a descriptive name.

---

<sup>1</sup> This template requires the file “UserScales2.col”. This text file contains the user *scale definitions*. Be sure to download this file and store it in the same directory as the main patcher.

<sup>2</sup> This template requires the *abstraction* “partial~.maxpat”. Be sure to download this file and store it in the same directory as the main patcher.

<sup>3</sup> This template requires the *abstraction* “simpleFM~.maxpat”. Be sure to download this file and store it in the same directory as the main patcher.

## Programming Guidelines & Suggestions

- Strive for well-organized code
- Comment your code
- Horizontally/vertically *align* objects (Arrange > Align)
- Consider using *segmented patch cords* (Cmd-y)
- Be sure to back up your work. It's nice to have a recent working version of your patcher to return to if everything suddenly stops working. Edit > Undo (Cmd-z) may also be helpful.
- Use Max's *interactive object Help* feature as you program
- Where appropriate, use the "self-commenting code" style; e.g., use number boxes to show musical parameter values as they change.
- When you run your patcher, be sure that Options > Overdrive is on. This gives computational priority to sound generation tasks.

## Submission Guidelines

### Paper

Write an informal 2-3 page(s) (typed, .docx, double spaced, bullet-point style) as described below for your project type:

#### MIDI:

Describe your artistic/technical goals in detail, as well as your choice of musical parameters/instruments.

#### AUDIO:

Describe your artistic/technical goals for each of the five sounds you create. Use the number and "title" for each sound as a section heading in your paper (e.g., Sound 1: FM Space Drum)

### File Submission

Put your name on the patcher using a **comment** object (e.g., replace the grey subtitle comment with: "by Jane Doe"). Upload your completed project patcher file(s) and paper (.docx) into the Blackboard assignment. Be sure to include file extensions on your file names (e.g., .maxpat for a Max patcher). If your project contains dependent files that must reside in the same directory as the main patcher (e.g., UserScales2.coll, partial~.maxpat, and simpleFM~.maxpat), be sure to upload those files as well.

## Grading

- Paper – 50%
  - Clarity, depth, effort
- Code – 25%
  - Code is well documented (using comments)
  - Objects are well organized (e.g., aligned)
  - Patch chords (or send/receive objects) are easy to follow
  - Program runs and syntax/flow is correct
- Creativity – 25%
  - The "quality" of the sound(s)
  - The "look" of the patcher (e.g., use of panel, color, etc.)
  - Innovative ideas/approaches

*I will present/discuss exemplary student projects in class.*