

Music 171: Computer Music I

Fall 2019

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Course Information

Teaching Assistants

- Elliot Patros: epatros@ucsd.edu
- Ke Chen: kec204@ucsd.edu
- Matthew Chung: mfchung@ucsd.edu

Meeting Time and Place

Meeting Dates: 10/26/2019 - 12/05/2019

	Time	Location	Instructor
Lecture:	T/Th 3:30PM - 4:50PM	CPMC 136	Smyth
Office hours (labs):	T/Th 5:00PM - 5:50PM	CPMC 136	Patros/Chen/Chung/Smyth
Project presentation:	M (12/09/19) 3 - 6 PM	CPMC 136	All

Course Description

This is an introduction to computer music and audio synthesis, both in theory and in practice, using the Pd program.

Prerequisites

Willingness to learn!

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Important Dates

- **Exams:** Thursday, 10/17 (w3), 11/7 (w6), 12/5 (w10), 2019.
- **Thanksgiving (NO CLASS)** Thursday 11/28 (w9), 2019.
- **Project proposal:** Tuesday 11/19 (w8), 2019.
- **Project presentations:** Monday 12/9, 3 - 6 PM (scheduled final exam), 2019.

Schedule and Online Lecture Notes (subject to change so REFRESH often)

- Week 0:
 - **Thursday:** Intro to Music 171, Computer Music, and Pd (in class, no link).
 - * `patches: pdIntro.pd, pdOnOff.pd`
- Week 1:
 - **Tuesday:** Sound and Sinusoids
 - **Thursday:** Digital Audio
 - * `patches: pdSlideFreqDelay.pd`
- Week 2:
 - **Tuesday:** Arrays and Counters
 - * `patches: pdArrayTable.pd`
 - **Thursday:** Wavetables and Samplers
- Week 3:
 - **Tuesday:**
 - **Thursday:** Exam 1
- Week 4:
 - **Tuesday:** Additive Synthesis
 - * `patches: cosineWavetableF19.pd, saxWavetableF19.pd,`
 - **Thursday:**
 - * `patches: classOct24.19.pd,`
- Week 5:

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Grading

- 3 Exams: 45%
- 5 Assignments 35%
- Final Project 20%

Required Textbooks

- Music 171 on-line notes.

Resources

Pd is free and you can run it on Windows, Linux, or Mac OSX. You can get it here.

Reference

- Puckette, Miller, The Theory and Technique of Electronic Music.
- A Digital Signal Processing Primer, Ken Steiglitz, Addison Wesley, 1996, 9780805316841

Final Project

- The final project should take on the form of a Pd patch which will be **briefly** demonstrated during the **scheduled final exam**.
- Patches must be submitted the day before presentations so they can be loaded and sequenced on the instructor's computer to ensure efficient transitions between presentations (time will be short!).
- Some project ideas (adapted Miller Puckette's list)
 - Make a piece of music (lasting about a minute) in the form of a Pd patch.
 - Make a drum machine / sequencer that plays a loop of (percussive) sounds **with variation from cycle to cycle**.
 - Make a patch that plays a Bach 2-part invention.
 - Experiment with random processes, e.g. a random note generator, that provides control of melodies, chords, or an entire composition.
 - For the computer savvy, write your own Pd external.
 - Make up your own idea (though come to office hour to talk about it first).
- **Proposal Requirement:** Each student must submit a project proposal with a brief (one paragraph) description by the deadline.

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- **Tuesday:** Additive Synthesis continued, abstractions and subpatches (see patches done in class/lab)
 - * `patches: classOct29.19.pd, myoutput.pd`
 - **Thursday:** Amplitude Modulation (AM)
 - * `patches: ARS.pd` (to appear after class) `RMAA.pd`
 - Week 6:
 - **Tuesday:** Frequency Modulation (FM)
 - **Thursday:** Exam 2
 - Week 7:
 - **Tuesday:** Frequency Modulation (FM), Control (no slides, see patch done in class)
 - * `control11.12.19.pd` (uses abstractions: `myoutput.pd`, `myasr.pd`, and `mysquare.pd`)
 - * `vibrato11.12.19.pd`
 - **Thursday:** Envelopes, FM instruments
 - * Arras (1980) by Barry Truax. Component sounds use FM synthesis.
 - `brass11.14.19.pd`,
 - `bell11.14.19.pd`,
 - `myxenv.pd` (exponential envelope **abstraction**, taking note duration (T60) as an input parameter).
 - Week 8:
 - **Tuesday:** Filters/Delay
 - * `bell11.19.19.pd`,
 - * `clarinet11.19.19.pd`,
 - **Thursday:**
 - * `delayline11.21.19.pd`,
 - * `comb11.21.19.pd`,
 - Week 9:
 - **Tuesday:** `fbcomb11.26.19.pd`,
 - **Thursday:** Thanksgiving (NO CLASS)
 - Week 10:
 - **Tuesday:**

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- * using sigmund with audio (live or recorded) to extract and remap pitch (in class),
 - * playPentBlues12.3.19.pd (uses mysquare.pd): play a blues/pentatonic scale in order or in random order,
 - * writeToTable12.3.19.pd: write a sequence to a table in real time,
- **Thursday:** Exam 3
- Week 11 (Exam week):
 - **Monday 3PM - 6PM:** Final project presentations.

Assignments

Assignments will be available **online** (course website and TritonEd) on Thursday and due via TritonEd **Friday@noon the following week**. Late assignments will be accepted up to the Tuesday following the due date, **but with a penalty of 10% a day**.

Assignment schedule is subject to change, but this will give you an idea:

- Assignment 1, due Friday October 4, 2019.
- Assignment 2, due Friday October 18, 2019.
- Assignment 3, SopSax.NoVib.ff.C4.wav, due Friday October 25, 2019.
- Assignment 4, due Friday November 8, 2019.
- Assignment 5, due Tuesday November 19, 2019.