Intermediate Computer Music:

Using MaxMSP / Jitter to Create Interactive Mixed-Music Projects

- MUS 329M (22545) AET 332 (20645) | Spring 2019 -

Tues / Thurs 2-3:20pm | MRH 4.170 (EMS Studio 2)
Prerequisite: MUS 329 J, or permission of instructor

Instructor:

Dr. Nina C. Young
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Office Hours: Tues / Thurs 3:30 - 4pm, or by appointment
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Pronouns: she/her

Teaching Assistant:

Monte Taylor
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Course Description:

This class is the second of a 2-semester sequence focused on using the computer to create generative music and to enable the creation of multimedia interactive performance, composition, and improvisation environments. In this second project-oriented course, students will enhance their knowledge of the graphical programming language MaxMSP and supplement this with other computer/electronic music tools to implement creative projects. Topics include synthesis techniques, video/graphics, multi-channel audio, tracking methods, aesthetics, historic and current repertoire, software architecture, performance organization, and documentation strategies. The course is focused around the creation of a significant final interactive performance work that will be featured on at least one end-of-semester EARS concert.

Course Objectives:

- Advance and expand upon existing skills in Max/MSP to create music, audio, and video applications. Use Max/MSP to study audio synthesis and processing algorithms.
- Learn the basics of Jitter - real-time video, graphics, and matrix processing.
- Investigate multi-channel audio and manipulation techniques.
- Investigate techniques, working methods, and aesthetics of interactive media performance composition.

- Interview an active artist using Max in their workflow.
- Create an original interactive performance piece for at least one live performer and computer.
- Write an original piece of interactive computer music (or design a performance environment, or other approved final project) using primarily MaxMSP.
- Become aware of repertoire, including contemporary and historic works of interactive composition and performance.

Materials:

- A licensed copy of Max/MSP v.8 on personal computer. Available at https://cycling74.com
    - Start with the 30 day trial
    - After 30 days, purchase an academic license:
        - $250: Max Academic Permanent License (with $99 upgrades to future versions) - recommended
        - $59: Max Academic Annual Subscription
- All other software is optional and should be purchased at the discretion of the student. The UTEMS studios have many software available that you can use, in studio. Note: some of the supplemental tools I will demo in class are only available on Macs. This does not mean that there aren't PC equivalents available.
- Additional readings / listening: available for download or from the Performing Arts Library.
- A good pair of closed headphones.

Supplemental Materials:

- DAW (Digital Audio Workstation) such as Logic Pro, Cubase, ProTools, Ableton, etc
    - Free: Ardour, Audacity
- Roads, Curtis: *The Computer Music Tutorial* (Cambridge: MIT Press, 1996)
- Cipriani, Alessandro & Maurizio Giri: Electronic Music and Sound Design - Theory and Practice with Max 7, Volumes 1&2, 2017.
- Manzo, V.J. *Max/MSP/Jitter for Music: A Practical Guide to Developing Interactive Music Systems for Education and More*
- MIDI controller

- You are **HIGHLY ENCOURAGED** (read: I kind of expect you to be there at least 50% of the time) to attend the UTEMS Wednesday *Electronic, Computer, and Experimental Music Seminar*. The schedule can be found here, and includes a really exciting guest roster, as well as workshops in Spear and Audiosculpt.

Assessment Measures:

55% Final Project Checkpoints (8 total)
20% Module Programming Assignments (4 total)
15% Midterm Interview Project (5% presentation, 5% paper, 5% transcript)
10% Attendance, participation, HW: Reading / Listening / Max Tutorials (7 total)

Canvas will be used to communicate all course information including calendar updates, lecture notes, example patches, listenings, readings, and assignment prompts. All assignments must be submitted on Canvas unless otherwise noted. Students must come to class with assignments on their computers (or already loaded onto the studio machine), and be prepared to present them in class.

Assignments will be posted as the semester progresses. Students are responsible for checking Canvas for updates, prompts, and deadlines.

Midterm Interview Project:
You will contact a currently active MaxMSP / computer music practitioner that you admire to learn about their work. You will conduct an official interview (in person, video chat, phone, etc.) and create a transcript (5% of course grade). You will also focus on 1-2 of their works and investigate their artistic process, aesthetics, and programming strategies. You will give a 15 minute presentation (5% of course grade) in class on the individual and their work, and you will write a 4-7 page paper (5% of course grade) on your findings.

Final Project (Checkpoints):
The focus of the class is on a polished work for live performer and interactive media that uses a score, events, and the Max environment. (Graphic scores are available to students without thorough training in notated western music composition.) To make sure that you are working on this throughout the semester, you must complete a series of 8-checkpoints. These are SERIOUS deadlines!

Course Calendar

All instructions, assignments, readings, rubrics, and essential information will be on the Canvas website. Check this site regularly to stay updated on the course schedule.

Class Schedule and Topics:

SYNTHESIS MODULE:

Week 01: Course intro and synthesis techniques

- Tues 01/22: Class intro. Workflow for making Mixed Music (live instruments and interactive media). Dates and deadlines.
- Thurs 01/24: A Deeper look at synthesis: additive, AM

Week 2: A Deeper look at synthesis: ring modulation, FM, Wavetable

- Tues 01/29:
- Thurs 01/31:

Week 3: Granular Synthesis and other fun tricks

- Tues 02/05: Tom Echols leads a class on working with granular synthesis
- Thurs 02/07: Fun tricks, and Final Project tutorial: how to mic your musicians

Module programming Assignment A:
Synthesis etude, due 02/12.

JITTER MODULE:

Week 4: Working with Jitter week 1

- Tues 02/12: Intro (prospective grad students visit class)
- Thurs 02/14: Tom Echols workshop / tutorial

Week 5: Working with Jitter, week 2

- Tues 02/19: Tom Echols workshop / tutorial
- Thurs 02/22: Tom Echols workshop / tutorial

Module programming Assignment B:
Create a jitter etude, due 02/28.

ARCHITECTURE, AESTHETICS, LOGISTICS MODULE:

Week 6: Patch architecture and creating mock-ups.

- Tues 02/26:
- Thurs 02/28:

Week 7: Pitch-shifting, time stretching, spectral freeze

- Tues 03/05:
- Thurs 03/07: When to fake live processing? (1 student midterm interview presentation)

Week 8: 15-minute Midterm interview presentations

- Tues 03/12: 3 student presentations
- Thurs 03/14: 3 student presentations

Module programming Assignment C:

Create your own buffer recording, pitch-shifter, time-stretching, and spectral freeze modules that can be inserted into your patch architecture. Make sure these modules have an argument based message and/or pattr storage system that works with your master patch architecture. Due 03/28.

[SPRING BREAK]

MULTI-CHANNEL AUDIO MODULE:

Week 9: Multi-channel Audio, IRCAM's spat5, Max 8's new "mc" objects

- Tues March 26:
- Thurs March 28:

Week 10: ...Continued...Multi-channel Audio, IRCAM's spat5, Max 8's new "mc" objects

- Tues April 2:
- Thurs April 4:

Week 11: ...Continued...Multi-channel Audio, IRCAM's spat5, Max 8's new "mc" objects

- Tues April 9:
- Thurs April 11:

Module programming Assignment D:

Create your two modules of your choosing using mc.

Implement multi-channel and mixdown functionality into your master performance patch. Due 04/18.

PROJECT IMPLEMENTATION MODULE:

Week 12: Event triggers: pedals, pitch-tracking, amplitude tracking, etc.

- Tues April 16:
- Thurs April 18:

Week 13: Individual 30 minute lessons on work-in-progress, to be scheduled around and outside of class time.

Week 14: Logistics, equipment, mixing boards, signal flow – how to make a live show!

- Tues April 30:
- Thursday May 2: guest artist lecture: Efraín Rozas (part of Seminar Series)

Week 15: FINAL CONCERT AND FEEDBACK

- Tues May 7: preparation for final concert
- Thurs May 9: Concert @Imagine Art!

Assignment Deadlines:

- 01/29: Final Project Checkpoint 1: Project Proposal, confirmed musical collaborator.
- 01/31: HW 1: Reading / Listening Written Response. Max Tutorials.
- 02/07: HW 2: Reading / Listening Written Response. Max Tutorials.
- 02/12: Module programming Assignment A
- 02/14: Final Project Checkpoint 2: "Discovery" recording session with collaborating musician to be completed. Finding sounds, techniques, audio for soundfiles.
- 02/19: HW 3: Reading / Listening Written Response. Max Tutorials.
- 02/26: HW 4: Reading / Listening Written Response. Max Tutorials.
- 02/28: Module programming Assignment B
- 03/05: Final Project Checkpoint 3: listen to and parse through audio from discovery recording sessions. Begin to make test files and soundfiles.
- 03/07: HW 4: Reading / Listening Written Response. Max Tutorials.
- 03/12: Midterm Interview In-Class Presentation (sign-up).

03/14: Midterm Interview In-Class Presentation (sign-up). Midterm interview transcription and paper due.

- 03/26: Final Project Checkpoint 4: Draft of score/project outline due, send to performer and arrange mock-up recording session.
- 03/26: HW 5: Reading / Listening Written Response. Max Tutorials.
- 03/28: Module programming Assignment C
- 04/04: Final Project Checkpoint 5: recording session completed, and mock-up of instrumental part edited. Now you can begin to fully test your modules and the flow between events in your patch. Feel free to sketch ideas in a DAW and then implement them in a similar fashion with Max.
- 04/09: HW 6: Reading / Listening Written Response. Max Tutorials.
- 04/16: HW 7: Reading / Listening Written Response. Max Tutorials.
- 04/18: Module programming Assignment D
- 04/22: Final Project Checkpoint 6: Final score edits due to performer (they need time to learn your piece)! Fully functional mock-up of piece, using the mock-up recording in your Max framework. This will be discussed in your private lesson. Make sure you have schedule rehearsals with your musicians!
- 05/07: Final Project Checkpoint 7: Final Concert
- 05/15: Final Project Checkpoint 8: Documentation, Recording, and Materials, due (online submission). HURRAY! You did it!!!

Course Policies:

Classroom expectations:

All students are expected to participate in class discussion, and are expected to respect the opinions and statements of their classmates during discussion and classroom activities.

Attendance:

Since I do not rely on a single textbook, but instead draw from various sources, some of which are unpublished, it is essential that you attend class regularly. Excessive absences will be noted and will affect your final grade, both directly (class participation grade) and indirectly (you won't know what you're doing in the assignments, quizzes, midterm exam, and/or the final exam/project). This is a fun class, show up, learn stuff, and you'll do just fine!

Assignments:

All assignments must be submitted via Canvas by the due date and time specified. Any sounds, abstractions, plugins, or other external files must be included in your submission. If something is missing, you will be notified and given the opportunity to resubmit, but with a late penalty. All grades are considered final and non-negotiable.

Late Assignments:

In fairness to all students, I will not give full-credit to late assignments. An automatic 5-point deduction is given to late assignments submitted within a week of the deadline. Assignments will receive 10-point deductions for every additional late week. Just do the work, even if it isn't perfect - you will learn something! Yay!

Final Project Checkpoints and Midterm deadlines are non-negotiable.

Please do not stress out about the amount of assignments due. The schedule looks nuts, but it is simply a way for me to guide you through your final project and to make sure you deliver a great work by the end of the semester.

The University of Texas at Austin provides, upon request, academic accommodations for qualified students with disabilities. See "University Policies" for more information.

Student Rights and Responsibilities:

- You have a right to a learning environment that supports mental and physical wellness. You have a right to respect.
- You have a right to be assessed and graded fairly.
- You have a right to freedom of opinion and expression.
- You have a right to privacy and confidentiality.
- You have a right to meaningful and equal participation, to self-organize groups to improve your learning environment.
- You have a right to learn in an environment that is welcoming to all people. No student shall be isolated, excluded or diminished in any way.

With these rights come responsibilities:

- You are responsible for taking care of yourself, managing your time, and communicating with the teaching team and with others if things start to feel out of control or overwhelming.
- You are responsible for acting in a way that is worthy of respect and always respectful of others.
- Your experience with this course is directly related to the quality of the energy that you bring to it, and your energy shapes the quality of your peers' experiences.
- You are responsible for creating an inclusive environment and for speaking up when someone is excluded.
- You are responsible for holding yourself accountable to these standards, holding each other to these standards, and holding the teaching team accountable as well.

Personal Pronoun Preference and Names:

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by a name different than what appears on the roster, and by the gender pronouns you use. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

University Policies:

Academic Integrity:

Each student in the course is expected to abide by the University of Texas Honor Code: "As a student of The University of Texas at Austin, I shall abide by the core values of the University and

uphold academic integrity." **Plagiarism is taken very seriously at UT.** Therefore, if you use words or ideas that are not your own (or that you have used in previous class), you must cite your sources. Otherwise you will be guilty of plagiarism and subject to academic disciplinary action, including failure of the course. You are responsible for understanding UT's Academic Honesty and the University Honor Code which can be found at the following web address: http://deanofstudents.utexas.edu/sjs/ acint_student.php

Q Drop Policy:

If you want to drop a class after the 12th class day, you'll need to execute a Q drop before the Q-drop deadline, which typically occurs near the middle of the semester. Under Texas law, you are only allowed six Q drops while you are in college at any public Texas institution. For more information, see: http://www.utexas.edu/ugs/csacc/academic/adddrop/qdrop

University Resources for Students:

Your success in this class is important to me. We will all need accommodations because we all learn differently. If there are aspects of this course that prevent you from learning or exclude you, please let me know as soon as possible. Together we'll develop strategies to meet both your needs and the requirements of the course. There are also a range of resources on campus:

Services for Students with Disabilities

This class respects and welcomes students of all backgrounds, identities, and abilities. If there are circumstances that make our learning environment and activities difficult, if you have medical information that you need to share with me, or if you need specific arrangements in case the building needs to be evacuated, please let me know. I am committed to creating an effective learning environment for all students, but I can only do so if you discuss your needs with me as early as possible. I promise to maintain the confidentiality of these discussions. If appropriate, also contact Services for Students with Disabilities, 512-471-6259 (voice) or 1-866-329- 3986 (video phone). http://ddce.utexas.edu/disability/about/

Counseling and Mental Health Center

Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress.

All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful.
If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support.
http:// www.cmhc.utexas.edu/individualcounseling.html

The Sanger Learning Center

Did you know that more than one-third of UT undergraduate students use the Sanger Learning Center each year to improve their academic performance? All students are welcome to take advantage of Sanger Center's classes and workshops, private learning specialist appointments, peer academic coaching, and tutoring for more than 70 courses in 15 different subject areas. For more information, please visit http://www.utexas.edu/ugs/slc or call 512-471-3614 (JES A332).

Undergraduate Writing Center:

http://uwc.utexas.edu/

Libraries:

http://www.lib.utexas.edu/

ITS:

http://www.utexas.edu/its/

Student Emergency Services:

http://deanofstudents.utexas.edu/emergency/

Important Safety Information:

If you have concerns about the safety or behavior of fellow students, TAs or Professors, call BCAL (the Behavior Concerns Advice Line): 512-232-5050. Your call can be anonymous. If something doesn't feel right – it probably isn't. Trust your instincts and share your concerns.

Title IX Reporting

Title IX is a federal law that protects against sex and gender-based discrimination, sexual harassment, sexual assault, sexual misconduct, dating/domestic violence and stalking at federally funded educational institutions. UT Austin is committed to fostering a learning and

working environment free from discrimination in all its forms. When sexual misconduct occurs in our community, the university can:

1. Intervene to prevent harmful behavior from continuing or escalating.
2. Provide support and remedies to students and employees who have experienced harm or have become involved in a Title IX investigation.
3. Investigate and discipline violations of the university's relevant policies.

Faculty members and certain staff members are considered "Responsible Employees" or "Mandatory Reporters," which means that they are required to report violations of Title IX to the Title IX Coordinator. **I am a Responsible Employee and must report any Title IX related incidents** that are disclosed in writing, discussion, or one-on-one. Before talking with me, or with any faculty or staff member about a Title IX related incident, be sure to ask whether they are a responsible employee. If you want to speak with someone for support or remedies without making an official report to the university, email advocate@austin.utexas.edu For more information about reporting options and resources, visit titleix.utexas.edu or contact the Title IX Office at titleix@austin.utexas.edu .

The following recommendations regarding emergency evacuation from the Office of Campus Safety and Security, 512-471-5767, http://www.utexas.edu/safety/

Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.

Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building. Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.
In the event of an evacuation, follow the instruction of faculty or class instructors. Do not re- enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.

Link to information regarding emergency evacuation routes and emergency procedures can be found at: www.utexas.edu/emergency