Synth Design in Max with Machine Learning
CalArts - Winter Session 2026

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Schedule:
Tuesday / Thursday: Room B318 1PM - 3PM
Wednesday / Friday: Room B324 1PM - 3PM

Course Description:

In this course, we will do a quick review on simple synth design in Max, making it open to people that have not used Max or beginners.

We will take a look at select machine learning tools. These may include Multi Layer Perceptrons (MLPs), K Nearest Neighbors (KNN), K - Dimensional Tree (KD-Tree), Principle Component Analysis (PCA), Uniform Manifold Approximation and Projection (UMAP), Hidden Markov Models (HMMs), and other supervised and unsupervised machine learning algorithms.

After getting a basic understanding of these tools, we will begin using them to mess around with parameters of effects, manipulate your sound files, create generative music, but that is only scratching the surface as the possibilities are endless.

What to bring to class:

- Laptop: This is a coding-heavy course, so a laptop is required to follow along. If this is a problem, please email me ASAP so we can find a solution. If possible, please install Max prior to class. For the FluCoMa library, Max 8 or newer is needed.

- Notebook & Pen: I highly recommend bringing something to write on. Sketching out logic and problems by hand often makes these complex concepts much easier to grasp.

Final Project will include the following:

- A presentation of your Max patch to the class that includes
    - What was your idea
    - Which ML tools did you use
    - Challenges throughout the process
- A live demonstration/performance of your Max patch

Course Plan:

Day	Content	Assignments
1	Quick refresh on the basics of Max and installing required packages	Explore Flucoma help files
2	Machine Learning Overview, Audio Features, and Hidden Markov Models	Explore the demos created in class and documentation within help files
3	Regression / Classification Models: K-Nearest Neighbors & K-Dimensional Trees	Explore the demos created in class and documentation within help files
4	Dimension Reduction: PCA and UMap	Explore the demos created in class and documentation within help files
5	Continue Dimension Reduction and Implementation	Explore the demos created in class and documentation within help files
6	Discuss MLPs	Come up with ideas on projects
7	Finish MLPs and discuss “real world” applications of machine learning. Start working on projects	Work on final projects
8	Share final projects	