

# Lab 4 - Wekinator

Thursday, July 15, 2010  
9:28AM

## PURPOSE

Goal: By the end of this lab, you will understand the how to use the Wekinator system for training and running MIR classifiers in real-time.

## INSTALLATION AND SETUP

Download the Wekinator from

<http://code.google.com/p/wekinator/downloads/detail?name=wekinator-2010-07-12.zip&can=2&q=>

Unzip it.

**If you are installing on your personal laptop** you'll have to also install Chuck , following the instructions here:

<http://wiki.cs.princeton.edu/index.php/Chuck/Wekinator/Instructions#1.> Get a working version of Chuck.2C if you don't have one already.

Finally, if you're running on a CCRMA machine, plug in a mic, turn up its gain to 11:00 or so, open a terminal window, and type the command "jackd" to start the jack server. In another terminal window, type the command "sndpeek" to check that you're getting input from the mic.

## RUNNING THE WEKINATOR

Take a look at the Wekinator running instructions at

[http://wiki.cs.princeton.edu/index.php/Chuck/Wekinator/Instructions#Running the Wekinator](http://wiki.cs.princeton.edu/index.php/Chuck/Wekinator/Instructions#Running_the_Wekinator) and use these as a reference to get started. In particular, make sure your Chuck executable location (/usr/bin/chuck on the CCRMA machines) and wekinator project directory location, as described in step 3 of the instructions.

## DOING SOME REAL-TIME MIR

In the Chuck configuration, choose a Chuck synthesis module to get started. The example synths live in the directory project/chuck/synths/. For starters, I recommend trying icmc\_beats.ck (a simple drum machine), adaptive\_audio\_pan.ck (pans the audio input according to the class), or icmc\_bowed\_physmod.ck (controls a physical model of a bowed string instrument). Choosing this synth is all you need to do for step 4 of the Wekinator instructions.

Once you've chosen your synth, run chuck (step 5 of the instructions).

In the "Features Setup" tab (step 6), choose one or more audio features to use to control your synth. If you're using your voice as input, try starting with only spectral centroid.

Follow the instructions for steps 7 & 8 to train a model to control your chosen synth with your chosen audio features.

### **Experimentation**

1. Experiment with different features. What sorts of things can you learn from only spectral centroid? From the raw FFT bins? (Hint: keep your FFT size equal to 512 or less, and make it a power of 2).
2. Experiment with different classifiers. Try creating a learning problem where kNN does better than AdaBoost.M1 (hint: AdaBoost is boosting on decision stumps), and another problem where AdaBoost.M1 does better than kNN.

### **USING WEKINATOR WITH MAX/MSP (OPTIONAL)**

If you're a Max user and have Max installed, you can download an example audio feature extractor from

[https://ccrma.stanford.edu/workshops/mir2010/tjanalyzer\\_extractor.maxpat](https://ccrma.stanford.edu/workshops/mir2010/tjanalyzer_extractor.maxpat)

To use it, you'll need to edit your Chuck Configuration to enable an OSC feature extractor with 9 features, and you'll need to specify 9 OSC features again on the "Feature Setup" pane. You'll also need to download the analyzer~ object from

<http://www.media.mit.edu/~tristan/maxmsp.html> and the OpenSoundControl object from <http://cnmat.berkeley.edu/downloads> .

You can also send Wekinator outputs to any Max patch. For an example, see [https://ccrma.stanford.edu/workshops/mir2010/blotar\\_synth.maxpat](https://ccrma.stanford.edu/workshops/mir2010/blotar_synth.maxpat) . The udpreceive object listens for parameters coming from the Wekinator, which are then used to control sound, while the udpsend object takes the current parameter values from Max and sends them to Wekinator (so that you can control these parameters from the Max GUI itself, for example by sliders or Max presets). To use your own patch with Wekinator, copy the udpreceive/route/unpack and the metro/pack/prepend/t/OpenSoundControl/udpsend objects, and adjust the number of parameters (i.e., 9 "1."s in the pack and unpack objects in the blotar). Finally, you'll need to specify in the Chuck configuration that you're using an OSC synth, and indicate the number of parameters your synth expects.

See <http://wiki.cs.princeton.edu/index.php/Chuck/Wekinator/Instructions> for more instructions and information.

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