

Music 159 – Midterm Project

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Prompt B: “Create a new software for sound processing (in Python) by combining the algorithms explained in the course: convolution, deconvolution, heterodyning, cross-synthesis, spectral freeze. Please provide a short document that explains your software and the source code.”

I’m personally new to Python (I use R), so a large part of this project was familiarizing myself with the syntax, the libraries, and reading documentation. I feel that this research was already a very worthwhile experience, as it helps me understand the CNN / RNN codes posted in bCourses.

In preparation of this project, I worked through the included .py files from past lectures to make sure I understood them. For example, I was able to appreciate the duality between convolution in the time domain and multiplication of the Fourier transforms in frequency domain.

<https://github.com/dsuryakusuma/159mt/blob/master/mt-proj.ipynb>

My code in `mt-proj.ipynb` is mostly exploratory work. After investigating the convolution function in python, I checked the effects of iterating convolution on x with the same h . The results are very unstable for high numbers of iterations, perhaps to be expected. Finally, I try out a pitch shift in frequency domain to raise the pitch of the `Diner.wav` acapella. The result is indeed increased pitch; however, the sound is easily robotic, despite adjusting the partition size for this process.

I learned a lot through this project, and I plan to further develop this understanding and skillset to be able to work with some of the machine learning techniques we learn in the course.