Demo 13 Exercises: Fast Fourier Transform and Numpy

DSP Lab (ECE 4163 / ECE 6183)

2021

Demo files

`FFT_demo_01.py`
`FFT_demo_02.py`
`FFT_demo_03.py`
`FFT_demo_04.py`
`FFT_demo_05.py`
`plot_microphone_input.py`
`plot_microphone_input_spectrum.py`

Exercises

1. **Amplitude Modulation.** Modify the Python program `plot_microphone_input_spectrum` so it applies *amplitude modulation* (AM) to the microphone input audio signal. The program should plot the live frequency spectra (Fourier transform) of both the input and output signals (use two different colors and/or two subplots to distinguish the two signals). The Fourier transform should be computed using the FFT. The program should also play the output (result of AM) to the speaker/headphones. What is the expected relation between the frequency spectra of the output and input signals? Do the input and output spectra you observe match the theory? SUBMIT