Demo 11 Exercises: Plotting

DSP Lab (ECE 4163 / ECE 6183)

2020

Demo files

`plot_wave_file.py`
`plot_wave_file_and_play.py`
`plot_microphone_input.py`

These demos require the Python library `matplotlib`. See the tutorial at

`http://matplotlib.org/users/pyplot_tutorial.html`

Exercises

1. **Stereo.** Write a program that plots in real time the left and right channels of a stereo wave file. Use a different color for left and right channels. The two waveforms in the plot may be vertically offset from on another to improve legibility.

2. **Filter.** Use a Butterworth bandpass filter to filter a wave file. Simultaneously play the output signal on the computer loudspeaker and plot both the input signal and output signal in real time, as your program scans through the wave file. Plot the input and output signals in real time. Use a different color for input and output signals.

3. Repeat the previous exercise, but take the input audio from the microphone instead of a wave file. (Note, demo 12B might be useful as reference for this exercise.) SUBMIT

4. **AM modulation.** Implement AM modulation to a wave file. Plot the input and output signals in real time. Use a different color for input and output signals.

5. Repeat the previous exercise, but take the input audio from the microphone instead of a wave file.