Audio Filtering

Signals & Systems

Lab #6

sound()

In MATLAB *sound()* can be used to send the sound to an output device such as speakers

sound(y,Fs)

y is the sampled amplitude vector. It is an 1xn matrix for mono sound and 2xn for stereo sound

Fs is sampling rate (frequency)

Audio file types

.au developed by Sun Microsystems typically used with Java and Unix

.wav developed by Microsoft for Windows PC

MATLAB functions for .wav

- *wavread()* – reads .wav files
- *wavrecord()* – records .wav files
- *wavwrite()* – writes .wav files
- *wavplay()* – plays .wav files

Default frequency is 11,025 Hz!

MATLAB functions for .au

- *auread()* – reads .wav files
- *auwrite()* – writes .wav files

Recording your sound

Audacity

Start Menu → Programs

- Set Microphone to Stereo Mix if you want to record part of a favorite tune from the web –OR-
- Set Microphone to Microphone or Rear Input if you have an external Mic.

In Audacity

- Record your sound.
- Export your file to the directory you are working out of.

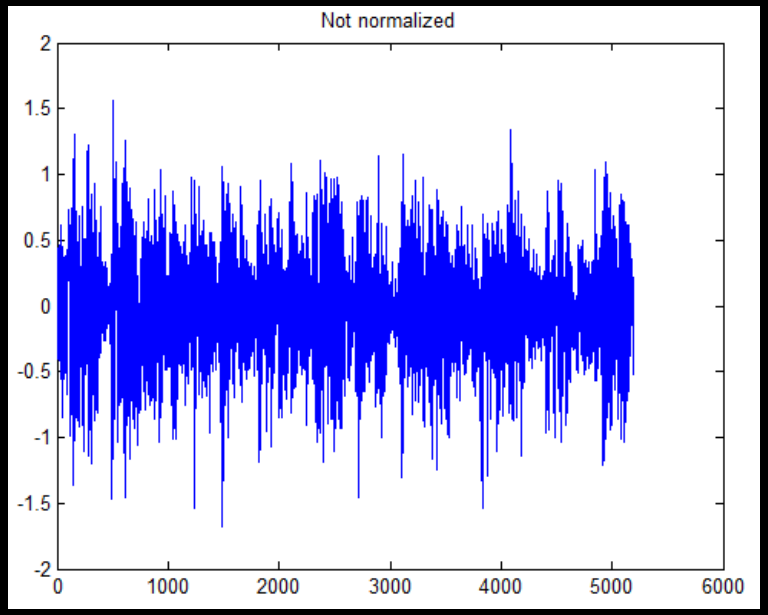
Code to Plot and Play

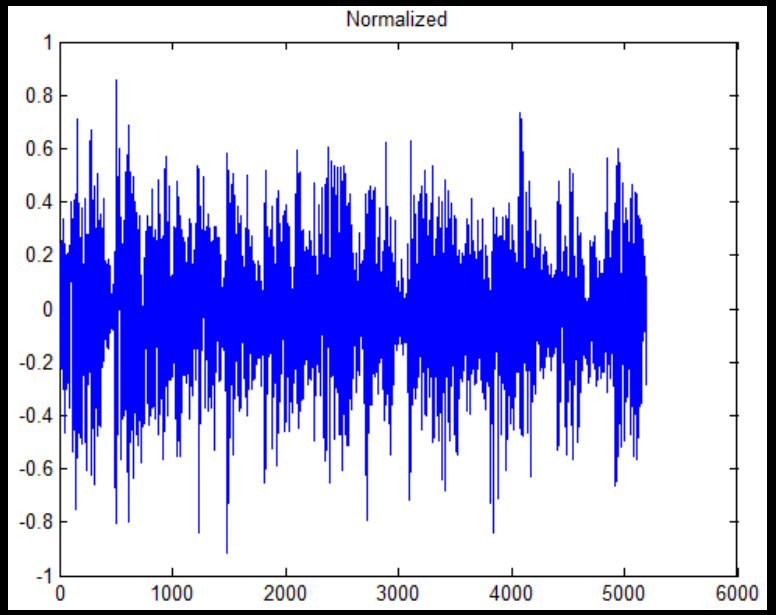
```
[x,sr]=wavread('listen.wav');
plot(x(1:100:end))
sound(x,sr)
```

Filtering

y= filter(h,1,x) gives the response, *y* , of a system with impulse response, *h*, to an input signal, *x*.

BUT WAIT! You need to normalize it first!





Link for Impulse Response

http://people.eecs.ku.edu/~esp/doku/doku.php?id=aseepaper

Sources

Attaway, S. (2012). *MATLAB a practical introduction to programming and problem solving* (2nd ed.). Waltham, MA: Butterworth-Heinemann.