DIGITAL SIGNAL PROCESSING: COSC390

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HOMEWORK 1.1.4 - QUESTION 1

Modify one of Octave scripts from the Unit 1 code folder on Moodle to obtain a *filtered* square-wave. [1]

1. The Fourier coefficient b_n corresponds to the $\sin(nt)$ term. Let $n = 2\pi f$, so $f = n/(2\pi)$. Evaluate the transfer function $|h(f)|$ for the single-pole high-pass RC filter at the frequency f. Call the result h_n.
2. Multiply each b_n by the corresponding h_n before building the whole series, then build the series and plot the signal.
3. How has the signal shape changed? What happens if you change the τ parameter (the value of RC) in the single-pole high-pass filter?

[1] The Fourier series of a square wave can be reviewed here: `https://en.wikipedia.org/wiki/Square_wave#Fourier_analysis`. This happens to be the *odd* version of the square wave.

Homework 1.1.4 - Question 2

Please talk to me about your final presentation for this course in the next few days. We will discuss the basic idea and where you will obtain the data. This should be done no later than Friday. Thanks! JCH