

Homework 4

BE/EE189 Design and Construction of Biodevices

Spring 2017

Due 2 Feb 2017

1. Develop a virtual low pass filter using DAQ analog input and output. Use the DAQ assistant to acquire a voltage signal. Apply a moving average filter and then output the filtered signal to a waveform chart and to the analog output channel. Use a `while` loop for continuous generation and acquisition of signals. Test your VI by filtering the output of a triangle wave from the FGEN port in NI ELVIS II system. Write the filtered voltage values to a file after you stop the while loop. To verify that it wrote correctly, you can plot the signal using some other software.

The moving average filter is defined by the following equation

$$y[n] = \sum_{k=0}^{N-1} \frac{x[n-k]}{N} \quad (1)$$

where $x[n]$ is the raw signal and $y[n]$ is the filtered signal.

2. Suppose we want to represent numbers in coded format. Consider the following code:

plaintext	ciphertext
1	lv
2	ma
3	po
4	ni
5	be
6	ut
7	ke
8	su
9	lu
0	ha

For, example, the number 987 is written in coded form as `lusuke`. Create a VI that takes a string as an input and output the equivalent number on a numeric indicator. Display `-1` if the input code does not translate.