Lab 1: Introduction to Arduino Platform

Follow the materials in the lecture to use the Arduino platform for data acquisition to the PC and then use MATLAB for further signal processing.

1 Try to be familiar with Arduino. See the Arduino training manual and finish the labs till class 7. No demo is required for this part.

2 (Sampling and Aliasing) Connect the function generator (Picoscope, see PICOSCOPE.pdf) to the ADC of the Arduino board. Set sine wave as the ADC input waveform with frequency of 100 Hz. Use the following frequencies (500 Hz, 200 Hz, 100 Hz, 80 Hz) to sample the input waveform.
   1) Plot the waveforms with the provided MATLAB codes.
   2) Use FFT to show the spectra of the saved samples.
   3) Discuss about the aliasing issues.

3 (Quantization) Use 10 bits, 8 bits, 5 bits, and 3 bits to sample the oscillator waveform.
   1) Plot the waveforms with the provided MATLAB codes.
   2) Use FFT to show the spectra of the saved samples.

TA: _____

© Department of Electrical Engineering, NTHU.