

EECS 20 Lab Guidelines

Overview

The labs for EECS 20 are designed to provide hands-on interaction and manipulation of the mathematical concepts presented in the course lectures. All labs are divided into two distinct sections, the in-lab and the lab write-up. The purpose of the in-lab is to confront concepts that lay the foundation for later parts of the lab. The in-lab is an ideal time to discuss any confusing or unclear concepts with the lab instructor. The lab write-up begins where the in-lab leaves off, extending the ideas presented in the in-lab. The purpose of the lab write-up is to promote deeper familiarity of the material as well as provide a glimpse of possible real-world applications for the mathematical tools.

In-Lab Details

Under most circumstances, the in-lab can be completed comfortably during scheduled lab time. An Instructor Verification Sheet allows the lab instructor to validate a basic ability and understanding necessary for the lab write-up. After completion, the Instructor Verification Sheet should be given to the lab instructor. In the rare event that the verification sheet cannot be completed, discuss with the lab instructor possible solutions, such as including the in-lab as part of the lab write-up.

Lab Write-up Details

Every lab write-up includes at least four main components: the title page, introduction, analysis, and conclusion. The title page provides the names of the members in the group, the name of the lab instructor, the name of the lab, and the date. The introduction briefly summarizes the purpose of the lab. It can be as short as three or four sentences that provide a roadmap for the lab. The analysis is the main body of the lab writeup. The conclusion briefly discusses the relevance of the concepts presented in the lab beyond the scope of the lab itself.

The key objective of the analysis is clarity. The analysis should closely follow the structure of the lab, and each corresponding section of the lab write-up should be clearly designated. Sections of the lab that ask questions or ask for discussion should be answered in complete sentences. Source code should be provided in a fixed width font (Courier, 10pt) and plots should be uniquely labeled and referenced in the write-up. Extensive source code (more than half of a page) should be placed in an appendix, and clearly labeled and referenced in the write-up. Plots may be included directly in the flow of the analysis. If included on a separate page, two to eight plots should be placed on the same page, depending on the nature of the plots. You can copy Matlab plots into most processors using the Copy command in the Edit menu.

Lab Write-up Analysis Excerpt

C.6.3.2. Simple Low Pass Filter

Figure 1 shows the data before (top) and after (bottom) the low pass filter. Clearly, after the low pass filter, sharp transitions in the original waveform have been heavily smoothed or obliterated. For instance, notice the disappearance of the step from sample points 91 to 94. The MATLAB code used to generate the smoothed waveform `v1` from the original waveform `x1` is:

```
h5 = [1 1 1 1 1] / 5;  
v1 = firfilt(x1, h5);
```

Figure 1 – Before and after LPF

