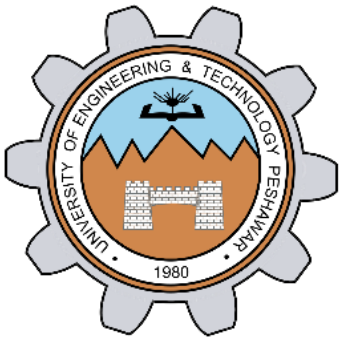
Final Project Report



Fall 2021

CSE 304L: Digital Signal Processing

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Class Section: **B**

Submitted to:

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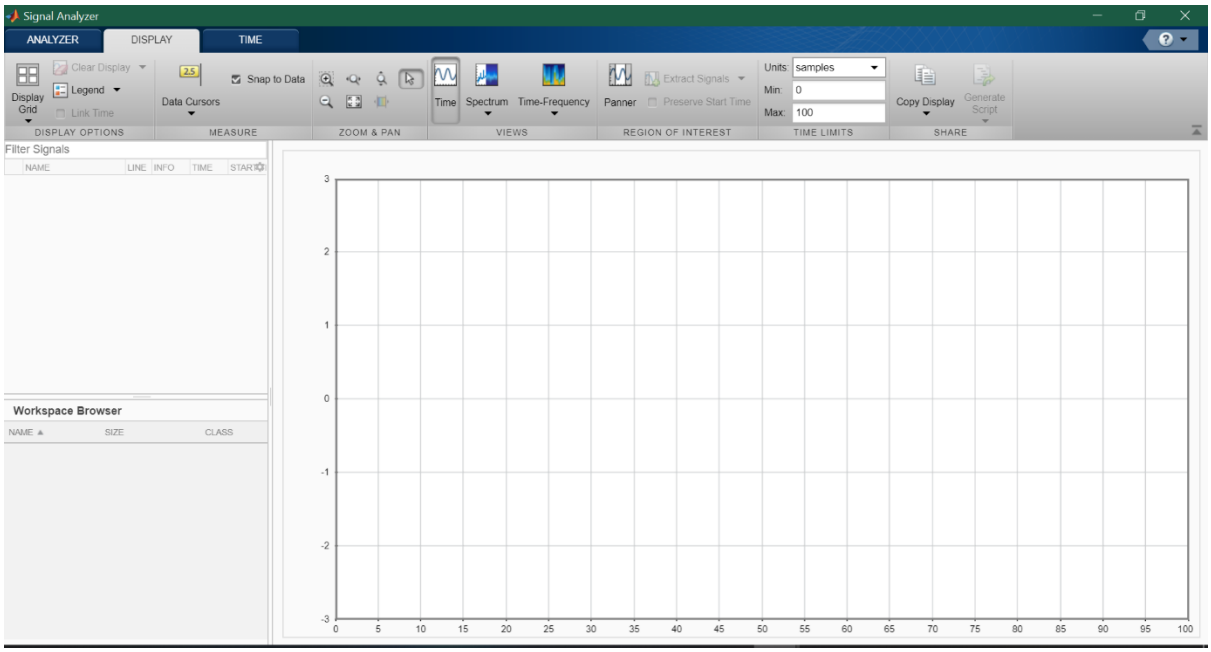
Signal Analyzer App

The **Signal Analyzer** app is an interactive tool for visualizing, measuring, analysing, and comparing signals in the time domain, in the frequency domain, and in the time-frequency domain. The app provides a way to work with many signals of varying durations at the same time and in the same view.

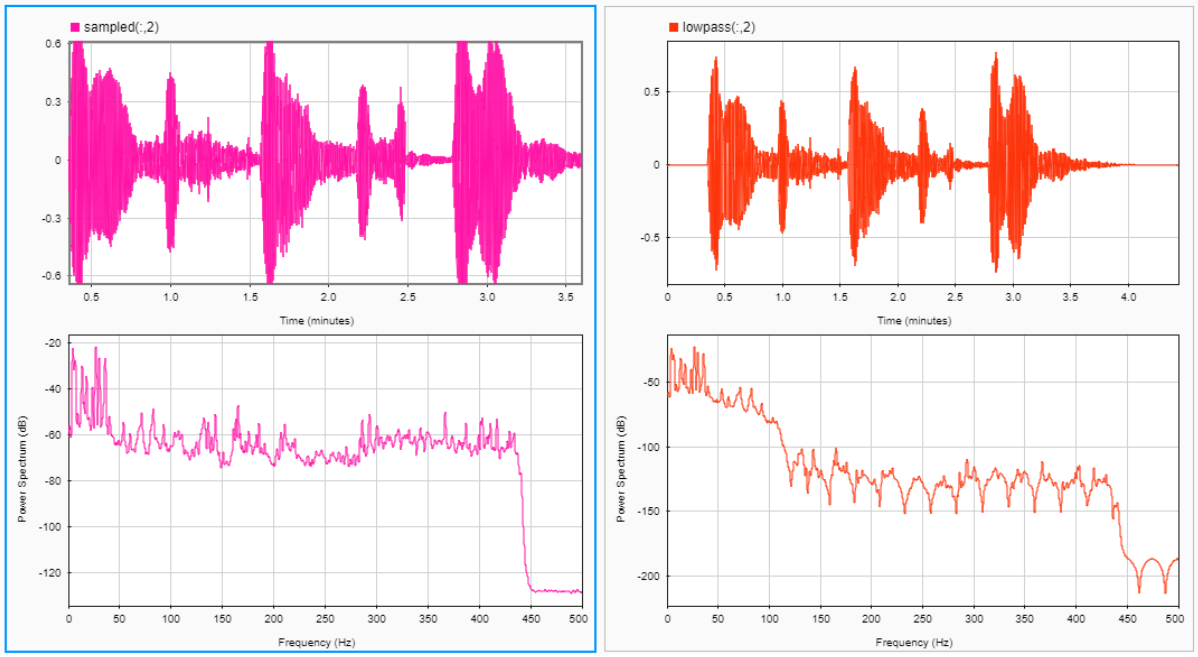


Importing Signal by Drag and Drop

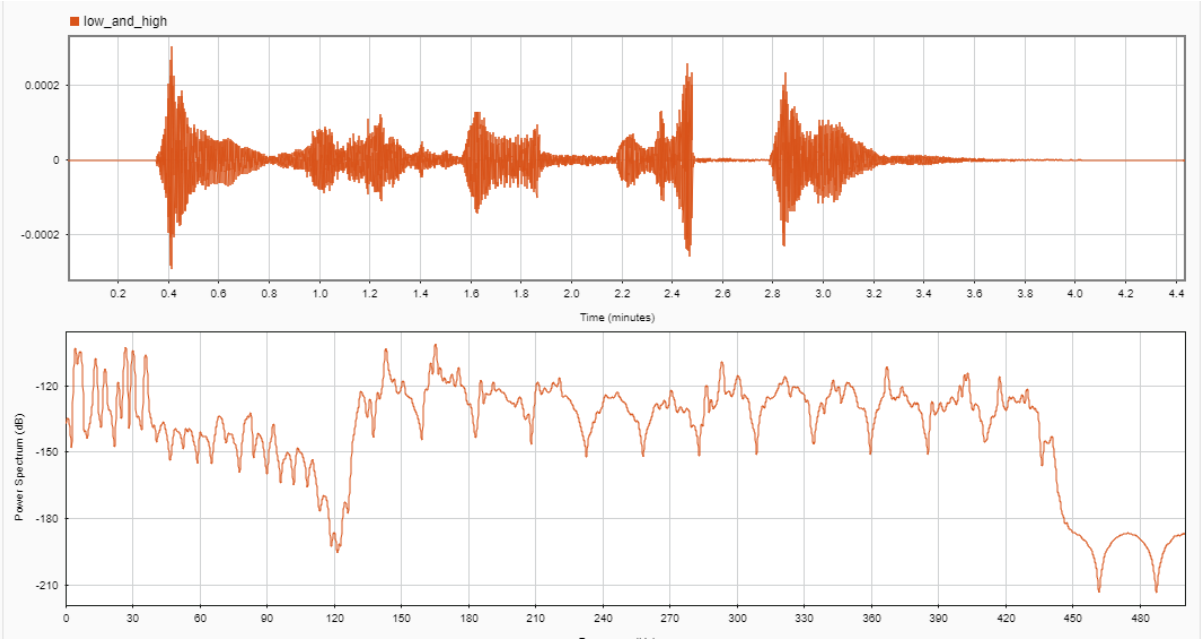
Select Signals to Analyze — Select any signal available in the MATLAB workspace. The app accepts real numeric arrays and signals with inherent time information, such as MATLAB timetables, timeseries objects, and labeled Signal Set objects. See Data Types Supported by Signal Analyzer for more information.

Preprocess Signals — Lowpass, high-pass, bandpass, or band-stop filter signals. Remove trends and compute signal envelopes. Smooth signals using moving averages, regression, Savitzky-Golay filters, or other methods. Change sample rates of signals or interpolate nonuniformly sampled signals onto uniform grids. Preprocess signals using your own custom functions. Generate MATLAB functions to automate preprocessing operations.

Low Pass Filter

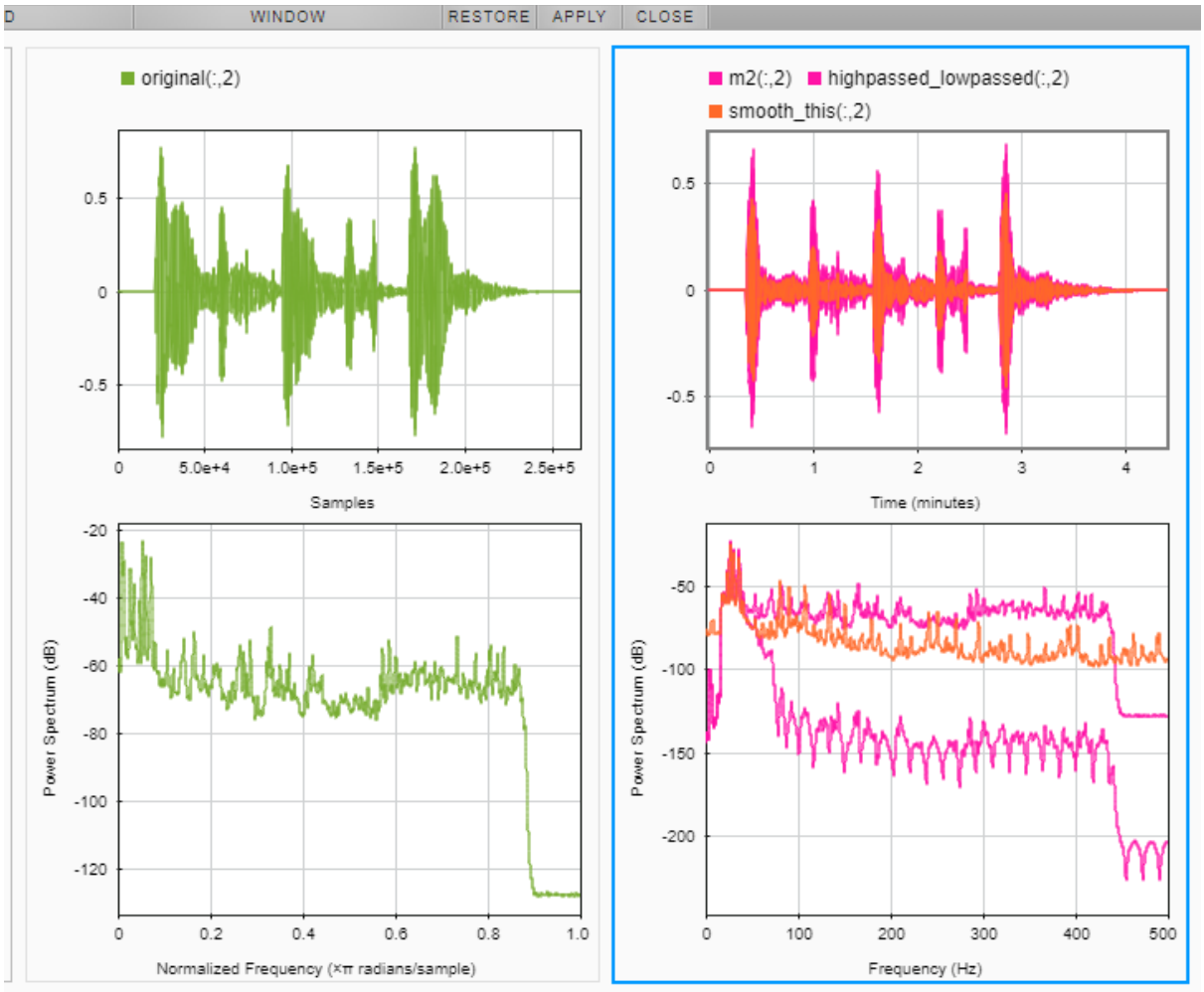


High Pass Filter

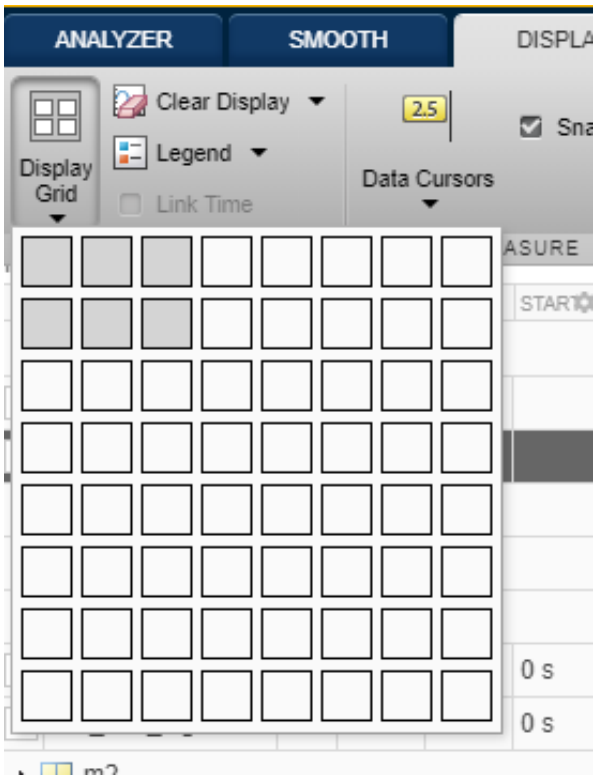


Smoothing Signal

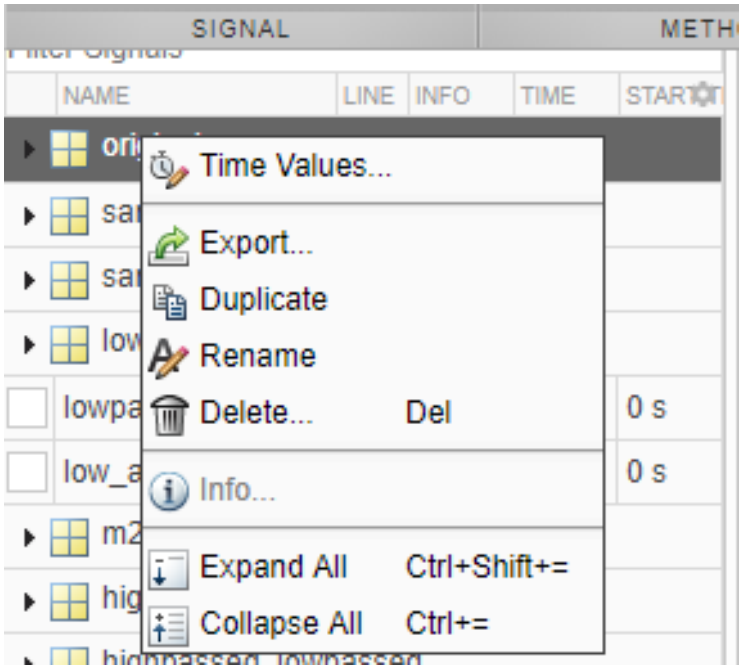
To smooth one or more selected signals, on the Analyzer tab, click the Smooth icon in the Preprocessing gallery. The app uses the MATLAB function smooth data to perform the smoothing.



Viewing Multiple Plots on same window

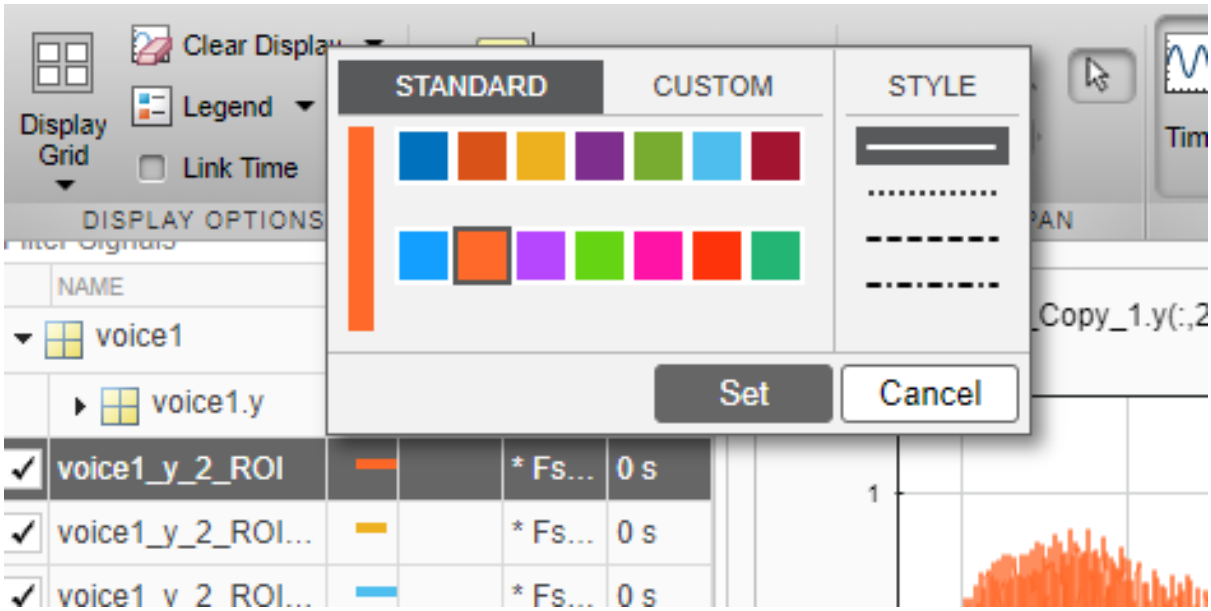


Duplicating the Original Signal:



Labeling Signals:

We can use the Signal Analyzer app to label signals interactively and visualize labelled signals. You can annotate signals for analysis and prepare signal datasets for machine learning and deep learning classification and regression tasks. See Signal Labeller for more information.



Export Signals

We can export any signals in the Signal Analyzer Signal table to the MATLAB workspace or to a MAT-file.

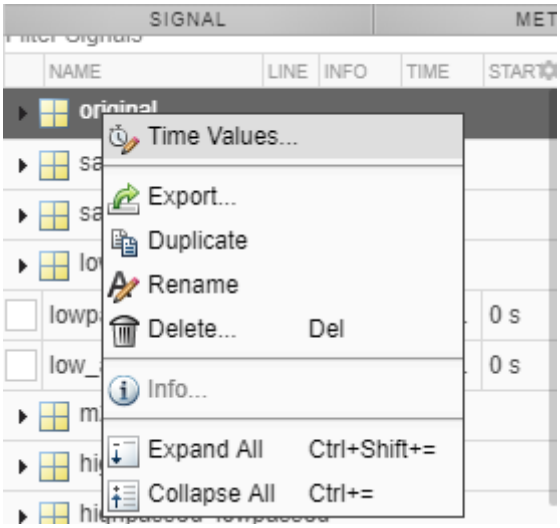
To export signals:

Select one or more signals from the Signal table.

On the Analyzer tab, click Export.

Choose whether you want to export the selected signals to the MATLAB workspace or save them to a MAT-file. If you choose to save the signals, browse to where you want to save the file, name the file, and click Save.

You can also select the signals, right-click, and select Export.


SIGNAL
NAME
LINE
INFO
TIME
Time Values...
Export...
Duplicate
Rename
Delete... Del
Info...
Expand All Ctrl+Shift+=
Collapse All Ctrl+=
0 s
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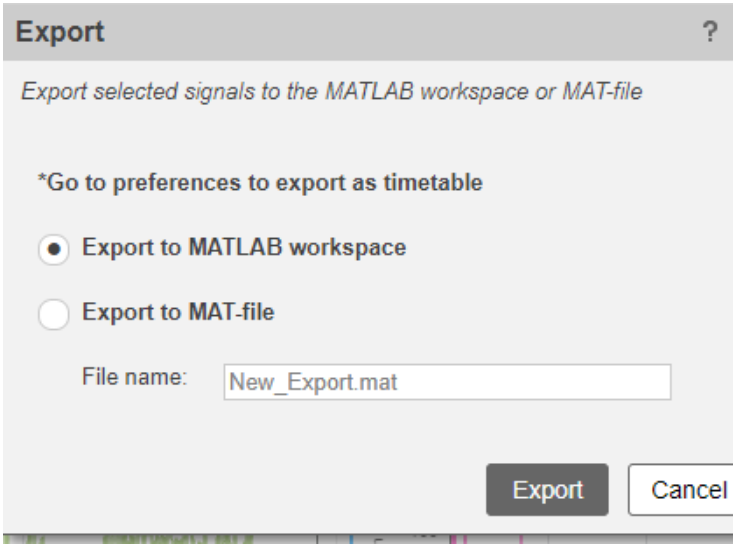
Export
?
Export selected signals to the MATLAB workspace or MAT-file
*Go to preferences to export as timetable
Export to MATLAB workspace
Export to MAT-file
File name:
New_Export.mat
Export
Cancel

****