

# Functional Verification

## EE 2304 Filters I – System Response

### Filter Response

1. Write a simple program to:
  - a. generate a random vector of size 100
  - b. filter the vector with an averaging filter.
  - c. plot both the input and output in the same figure

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### Room Simulation

2. Use a simple GUI tool (**roomsim**) to generate room effects in sounds. You'll need to write a MATLAB function (**convir**) for the GUI tool that will:

- Read the input sound file.
- Convert the sound data from stereo to mono.
- Downsample the input to reduce the processing load and the convolution time. This is also necessary to make the sampling rates of the input signal and the impulse response the same.
- Read the impulse response from a file.
- Convert the impulse response data from stereo to mono.
- Downsample the impulse response.
- Perform the convolution and compute the output.
- Save the output as in a specified file.

3. Run the GUI **roomsim** using the function **convir**. Use the input file **tone** and the impulse response **echo**

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4. Run the GUI **roomsim** using the function **convir**. Use two other input and impulse response files.

Input file \_\_\_\_\_ Impulse response file \_\_\_\_\_

Input file \_\_\_\_\_ Impulse response file \_\_\_\_\_

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