DSP EEE F434: Practical 6
Project: Short Term fading

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Task 1: Time-domain Multi-path channel

1. Sum N uniform random variable. Plot histogram of sum for $N = 5, 10, 50, 100$.
2. Use the delay profile from 5G ETSI document Table 7-7-2.1 TDL-A page 64 to generate a channel Rayleigh fading channel. Use Matlab rayleighchan(). Use fd=0 and delay spread 100ns.
3. Show that the channel is indeed Rayleigh by plotting histogram of magnitude of channel gains.
4. Use histogram to show that the channel gain is Gaussian.

Task 2: Frequency domain multi-path channel

1. Considering different symbol interval t_s, plot frequency response of the channel. Is it an FIR/IIR?
2. What is effect of increase/decrease of symbol interval related to delay spread?
3. Find the output samples when a signal of symbol duration t_s is passed through the channel.
4. Use Toeplitz representation of convolution to recover transmitted signal.
5. Transmit a sinusoidal signal of frequency 1 KHz over this channel. Plot the output signal.