

4. Generating different types of noise and comparing different noise reduction methods

In this problem, you are required to write a program to generate different types of random noise (Uniform, Gaussian, Rayleigh, Gamma, Exponential and Impulse, first started from the uniform noise and then use some functions to convert the uniform noise to Gaussian, Rayleigh, Gamma and Exponential; Impulse noise is generated in a different way, consulting the textbook and some other references) and then add these noises to the test pattern image Fig0503(original_pattern).tif to compare the visual results of the noisy images.

Add some of these noises to the circuit image Circuit.tif (images can be found at <ftp://ftp.cs.sjtu.edu.cn:990/lu-ht/DIP/images>) and investigate the noise reduction results using different mean filters and order statistics filters as the textbook did at pages 344-352 (Pages 322-329 in the electronic version of the textbook).