6.1 Image noise models and noise diagnostics

6.1.1. Additive noise model
Generate and observe additive Gaussian noise in images. Compare 1-D power spectra of noisy and noiseless images. Observe image auto-correlation functions (program corimg1d.m). Evaluate noise variance (program noisevar.m) and investigate its accuracy for different SNR.

Generate periodic noise image, use program detmoir1.m to characterize it. Images moire.img, jeep.img, magcrop.img can be used along with those generated by you.

6.1.2. Impulse noise model
Generate and observe impulse noise in images. Observe difference signal histograms of noisy and noiseless images (program pnoise.m). Investigate, how noise variance estimation found by program noisevar.m is connected to the probability of errors.

6.2 Algorithmic models of texture images

6.2.1. Point-wise transformation (PWT-) models
Write a program for generating binary images with a given probability of ones.
Generate an inhomogeneous pseudo-random field with local probability of ones controlled by an auxiliary image.
Generate an inhomogeneous pseudo-random field with local variance controlled by an auxiliary image.

6.2.2. Linear filter (LF-) models
Generate and observe Gaussian pseudo-random patterns with different power spectrum (programs corrgauss.m, gtexture.m).
Generate and observe model texture images with power spectrum defined by power spectrum of auxiliary images of detail and texture types.
Generate and observe inhomogeneous Gaussian pseudo-random field with local power spectrum defined by local power spectrum of an auxiliary image (program lcdctrnd.m).

6.2.3. Composite models
PWT-LF model. Generate a figure texture using the above program for generating binary image with a given probability of ones and program conv2.m.
LF-PWT model. Generate a pseudo-random binary images using programs for generating Gaussian pseudo-random fields with different power spectrum (programs corrgauss.m, gtexture.m).

6.2.4. Evolutionary models (optional)
Generate binary pseudo-random fields using programs lifebin1.m, conway.m, dendrite.m and observe their evolutionary behaviour.

Submit
1. Results of evaluating accuracy of additive noise variance measurement for different images.
2. Results, with comments, of experiments with periodic noise.
3. Results, with comments, of generating texture images