Exercise 2: Appendix

Statistical Methods in Image Processing 048926

In this exercise you will use two types of high order MRF models. The parameters θ of these models are given to you as two matlab files. The two models were trained using gray scale images with pixel values in the range $[0, 255]$.

studentT.mat: contains a struct with all the parameters of the student-t model:

$$p(x) \propto \prod_c \phi_c(x_c; \theta),$$

where

$$\phi_c(x_c; \theta) = \prod_{m=1}^{M} (1 + \frac{1}{2}(J_m^T x_c)^2)^{-\alpha_m}.$$

studentT.dims - the dimensions of the cliques (3×3 in our case).

studentT.m - number of filters.

studentT.J - m model's filters. Each column is a filter of size dims $\times$ dims.

studentT.alpha - $n \times m$ the power values.

GSM.mat: contains a struct with all the parameters of the Gaussian Scale Mixture model:

$$p(x) \propto \prod_c \phi(x_c; \theta),$$

where

$$\phi_c(x_c; \theta) = \prod_{m=1}^{M} \sum_{n=1}^{N} \alpha_{mn} \frac{1}{2\pi s_n} \exp\left\{\frac{1}{2s_n}(J_m^T x_c)^2\right\},$$

GSM.dims - the dimensions of the cliques (3×3 in our case).

GSM.m - number of filters.

GSM.J - m model's filters. Each column is a filter of size dims $\times$ dims.

GSM.n - number of scales.

GSM.s - n scales values.

GSM.alpha - $n \times m$ weights values.