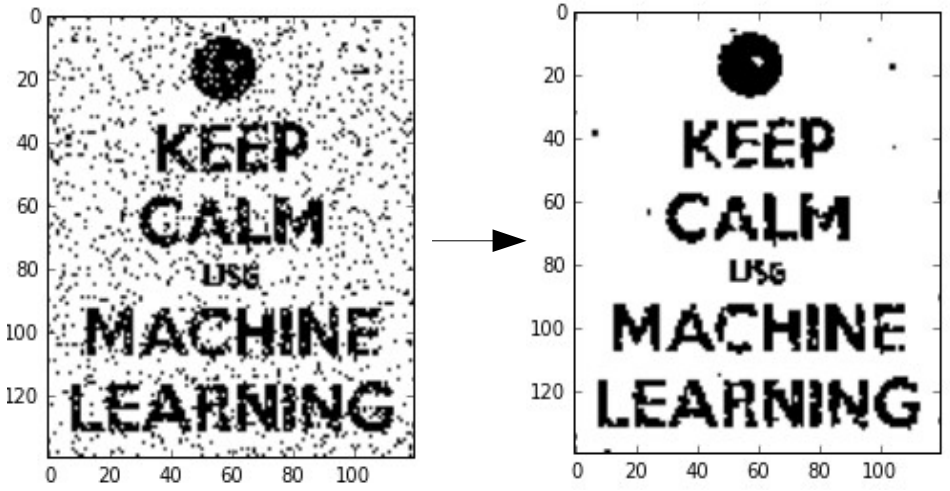
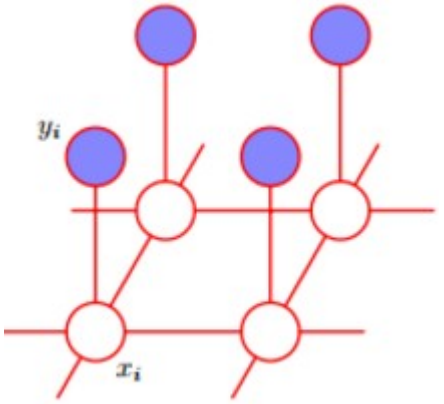


Noisy image

De-noised image



Undirected graphical model representing a Markov Random Field for de-noising.
xi is binary variable denoting state of pixel i in in noise-free image.
yi denotes corresponding value of pixel i in observed noisy image.

η Σi xi.yi : Energy function for clique formed by noise-free(xi) and noisy(yi) image.

β Σij xi.xj : Energy function for clique formed by neighboring pixels of noise-free image.

β , η : positive constants.

Energy function is given by

E(x,y) =h Σi xi – β Σij xi.xj – η Σi xi.yi

(xi, xj are neighboring pixels)

Image de-noising using Markov Random Field

Algorithm

1. noisy_free_image = noisy_image
2. for each pixel xi in noisy_free_image do:
3. e_plus = calculate energy from energy function with xi=1 label
4. e_minus = calculate energy from energy function with xi=-1 label
5. if e_plus < e_minus then:
6. label of xi=1
7. else
8. label of xi=-1