Blurring and shifting DOG responses

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- The blurring operation as the computation of the maximum value of the weighted thresholded responses of a DoG filter.

- For weighting, multiply the responses of the DoG filter by the coefficients of a Gaussian function, whose standard deviation is a linear function of distance ρ_i from the support center of the filter.

$$\sigma' = \sigma'_0 + \alpha\rho_i,$$

  where σ'_0 and α are constants.

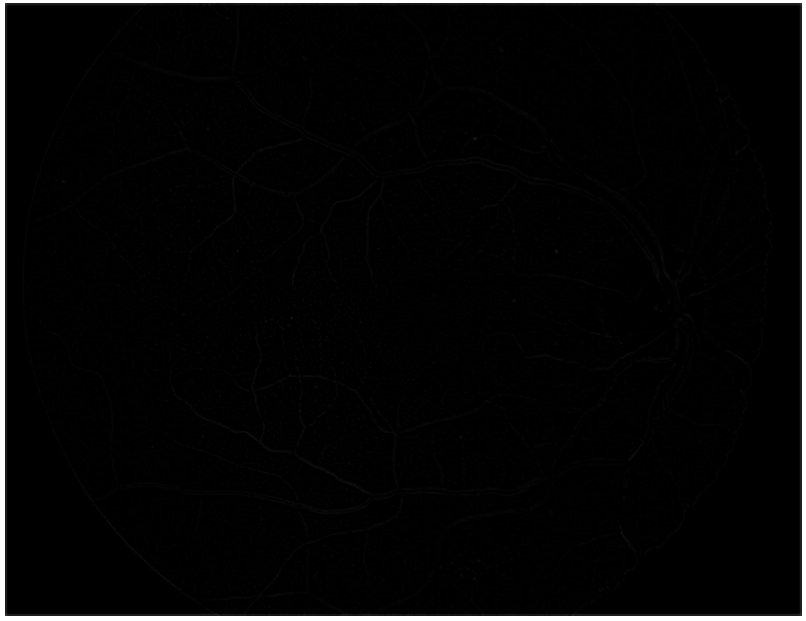
- Then each blurred DoG response is shifted.

- The blurred and shifted response of DoG filter is given by:

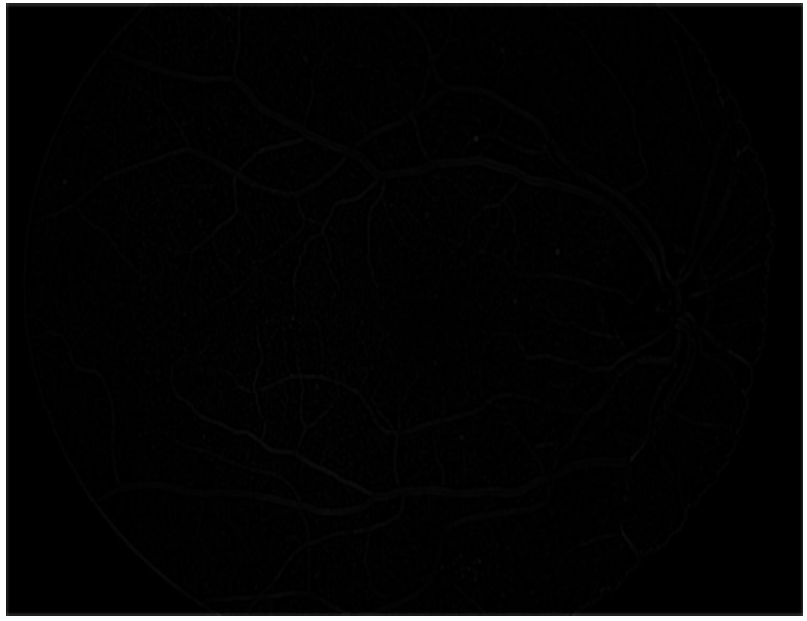
$$s_{\sigma_i,\rho_i,\phi_i}(x,y) = \max_{x',y'}\{c_{\sigma_i}(x - \Delta x_i - x', y - \Delta y_i - y')G_{\sigma'}(x',y')\},$$

$$-3\sigma' \leqslant x',\ y' \leqslant 3\sigma' \qquad \Delta x_i = -\rho_i \cos\phi_i \qquad \Delta y_i = -\rho_i \sin\phi_i$$

DOG response

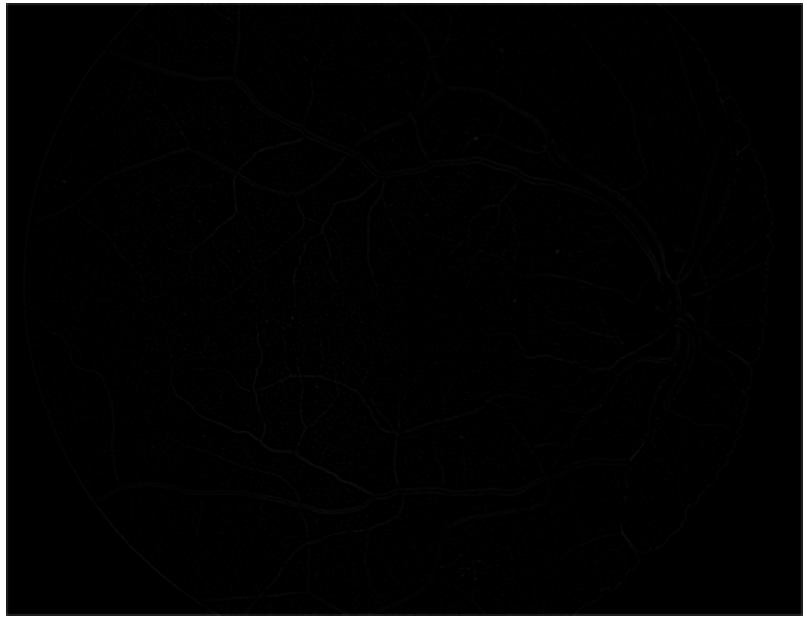


blurshift of DOG response

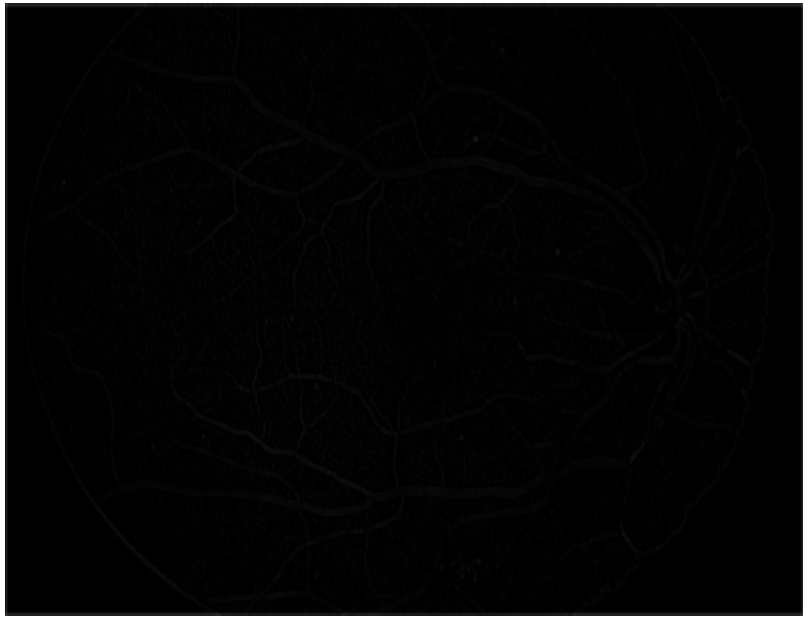


sigma	**0.5**
sigma0	0.5
alpha	0.1167
rho	0

DOG response

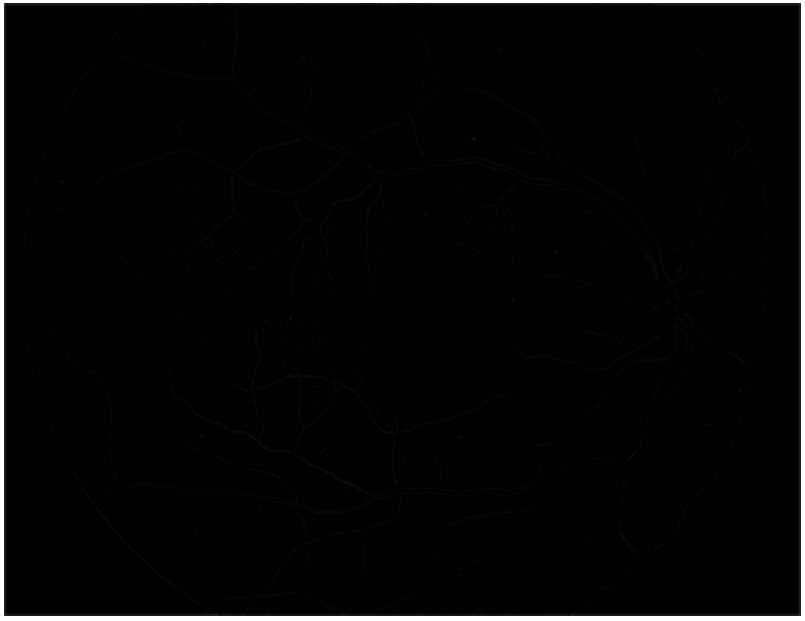


blurshift of DOG response

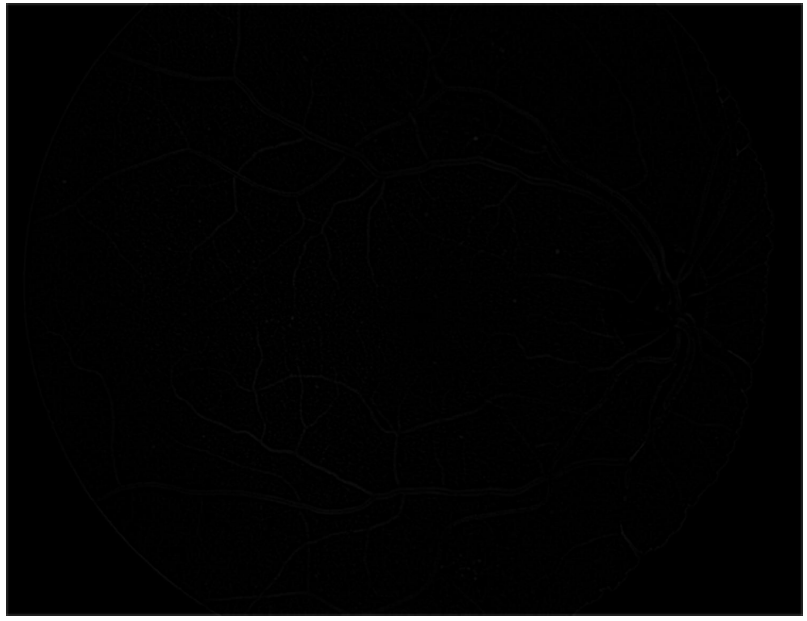


sigma	**0.733**
sigma0	0.5
alpha	0.1167
rho	2

DOG response

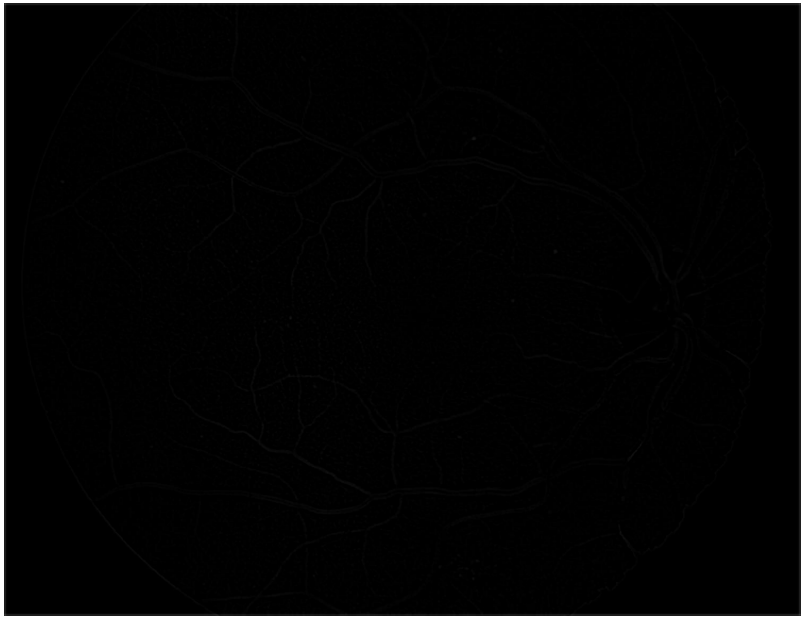


blurshift of DOG response

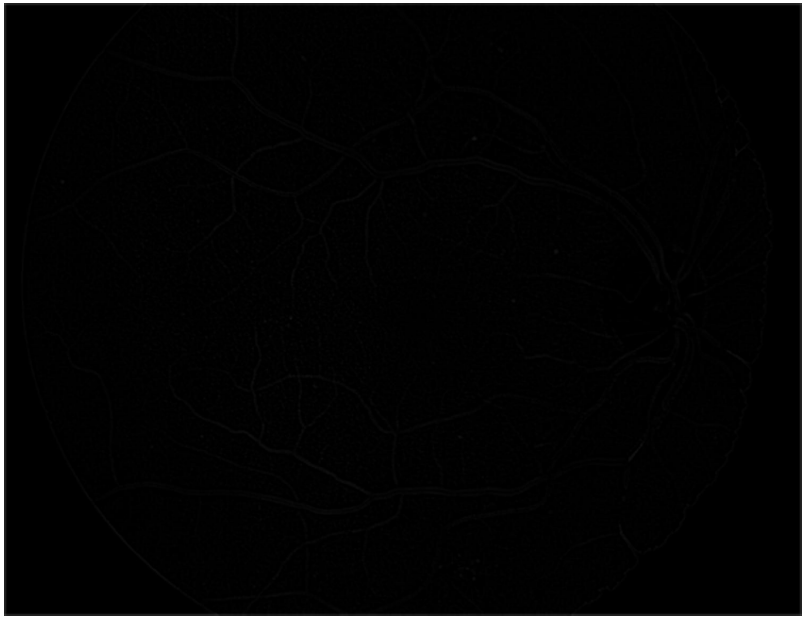


sigma	**0.9667**
sigma0	0.5
alpha	0.1167
rho	4

DOG response

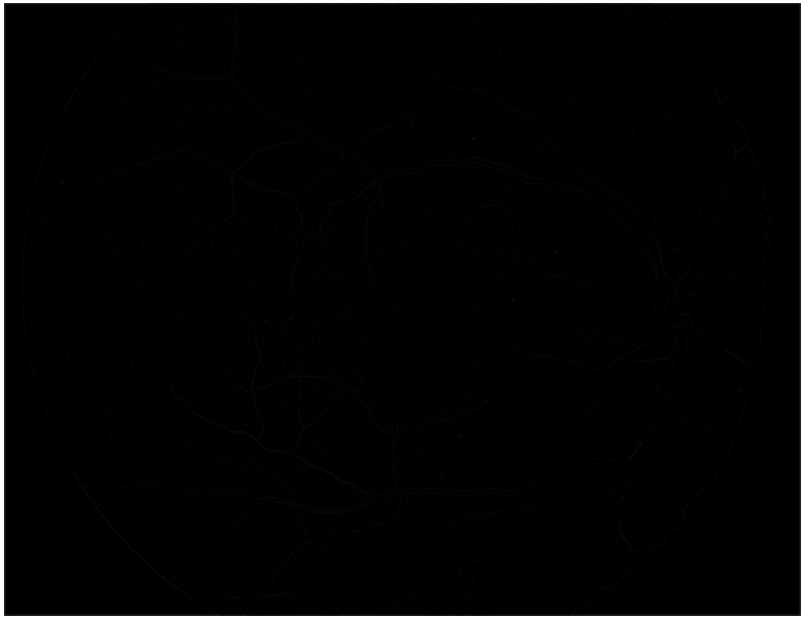


blurshift of DOG response

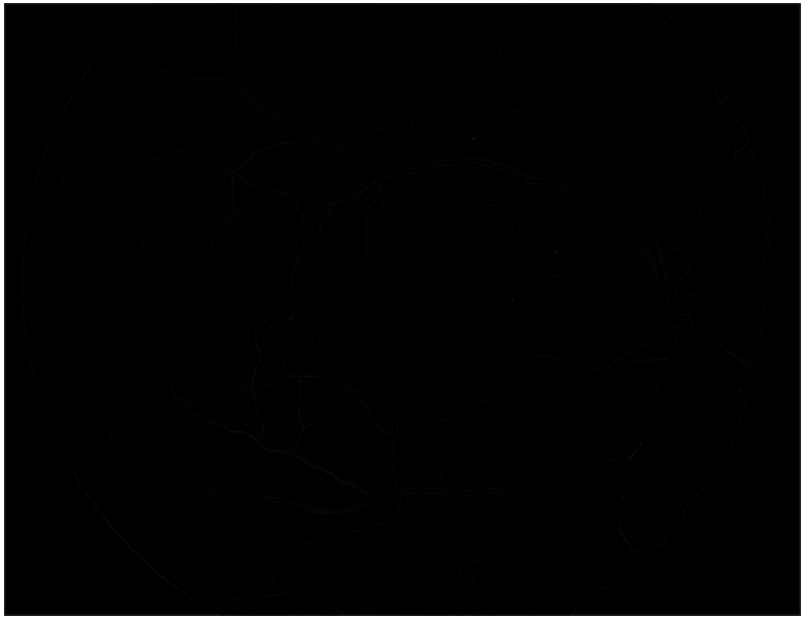


sigma	1.2
sigma0	0.5
alpha	0.1167
rho	6

DOG response



blurshift of DOG response



sigma	**0.33**
sigma0	0.33
alpha	0.0167
rho	0