$$\min_{g} J(g) = \iint_{D} \frac{\|f(I) - f(\hat{g}(I))\|_{2}}{\|f(I) - f(\hat{g}(I))\|_{2}} + \lambda \frac{\|s(I) - s(\hat{g}(I))\|_{2}}{\|s(I) - s(\hat{g}(I))\|_{2}} dxdy$$