

NOTATIONS/SYMBOLS

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| A_{pq} | Angular radial transform moments with order p and repetition q |
| a_φ | Wavelet approximation coefficients |
| b | Background grayscale value in step edge pattern |
| $c(\cdot)$ | Diffusion function for non linear diffusion |
| C_m | Threshold used in edge enhancing and coherence enhancing diffusion |
| D_c | Composite distance measure |
| $ds_{i,j}$ | Distance between two images I and J |
| D | Distance measure |
| $D_T(\cdot)$ | Diffusion tensor |
| d | Dilation used in approximation and wavelet functions |
| d_ψ | Wavelet detail coefficients |
| div | Divergence |
| $E(\cdot)$ | Expected value of random variables |
| e_λ | Expected value of g_i |
| $\exp(\cdot)$ | Exponential |
| e^2 | Sum of squared error |
| $f(x, y)$ | Image intensity function in Cartesian coordinates |
| $f(r, \theta)$ | Image intensity function in polar coordinates |
| G_σ | Gaussian distribution |
| G_{xy} | Gradient image derived using Sobel operator |
| g_i | Grayscale intensity value of pixels in the image |
| h | Height of the step edge |
| h_m | Histogram of different regions |
| H_m | Modified gray level information histogram |
| I_E | Estimated image |
| I_G | Image with Gaussian noise |
| I_N | Image with Poisson's noise |
| I_0 | Initial image at time $t = 0$ |

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| J | Morphological Structuring element |
| k | Conductance parameter |
| ℓ | Perpendicular distance from the centre of unit circle to the edge location |
| L | The max pixel intensity |
| MSE | Mean square error |
| N | Image length or image width |
| N_i | The number of edge points in a specific region |
| n_i | The number of pixels at the gray level r in a certain region |
| $PC(\theta_k)$ | Central projection vectors |
| $P(\cdot)$ | Discrete Poisson probability |
| p_{max} | Maximum order of moments |
| p | Order of moments/ transforms |
| $PR(r)$ | Ring projection vectors |
| PZ_{pq} | Pseudo Zernike moments with order p and repetition q |
| PZ'_{pq} | Pseudo Zernike moments of the rotated image of order p and repetition q |
| R_{pq} | Radial polynomials with order p and repetition q |
| q_{max} | Maximum repetition of moments |
| q | Repetition of moments/transforms |
| r | Radius |
| (r, θ) | Polar coordinates |
| S_W | Spatial window |
| T_g | Denotes the limits of the gradient intervals |
| $T(\cdot)$ | Transformation |
| $T^{-1}(\cdot)$ | Inverse transformation |
| Th | Edge detail parameter |
| $T_i(m, n)$ | Template image of size $m \times n$ |
| t_s | Template size |
| (t_x, t_y) | Translation in x and y direction |
| t | Translation |
| s | Scaling |

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|------------------------------|--|
| $\text{var}(\cdot)$ | Variance |
| V_{pq} | Complex orthogonal polynomials/basis function of order p and repetition q |
| V_{pq}^* | Complex conjugate of orthogonal polynomials/ basis function of order p and repetition q |
| w_i | Statistical weighting coefficients |
| (x, y) | Cartesian coordinates |
| (x_c, y_c) | x, y coordinates of centroid of image |
| Z_{pq} | Zernike moments of order p and repetition q |
| Z'_{pq} | Zernike moments of the rotated image of order p and repetition q |
| α | A small positive parameter to keeps diffusion tensor uniformly positive |
| β | Edge direction angle |
| γ | Scaling constant used Pratt's figure of merit |
| ε | Edge enhancing diffusion fraction |
| η_i | Poisson's noise |
| θ | Angular coordinate |
| $\lambda_{ei}/\lambda_{ci}$ | Derived eigenvalues using edge enhancing /coherence enhancing diffusion |
| λ_{hi} | Hybrid eigenvalue derived using combination of edge enhancing /coherence enhancing diffusion |
| $\widehat{\mu}_F$ | Edgy fuzzy membership |
| $\mu_1/\mu_2/\mu_3$ | Eigenvalues |
| μ_{\neg} | Fuzzy compliment |
| μ_F | Fuzzy membership function |
| ξ | Ratio between various eigenvalues |
| π | Pi |
| $\sigma_{f_r f_t}$ | The correlation coefficients |
| $\sigma_{f_r}, \sigma_{f_t}$ | The standard deviation of the pixel intensities in the images |
| v_1/v_2 | Eigenvectors |
| $\varphi_{d,t}$ | Approximation function used in wavelet transform |

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|--------------|--|
| ϕ | Rotation angle |
| $\psi_{d,t}$ | Wavelet function used in wavelet transform |
| Δt | Time step |
| ∇I | Gradient image |
| \cap | Fuzzy intersection |
| \ominus | Mathematical morphological Hit or Miss transform |