SYMBOLS

Chapter 3

$T1$  
Relaxation time (also known as the spin-lattice relaxation time) in MRI

$W$  
Neighborhood centered around location $(m,n)$

$T$  
Threshold derived for the equalized image

$M$  
Masking Matrix

$z_i$  
Random variable indicating intensity

$p(z)$  
Histogram of the intensity levels in a region

$L$  
Number of possible intensity levels

$m$  
Mean (average) intensity.

$\mu_2(z)$  
Second moment

$\sigma^2$  
Variance

$P(ai)$  
Probabilities with the pixel values $a_i$

$\phi(X,t)$  
Level Set Function

$F$  
Velocity term that describes the level set evolution

$\alpha \in [0,1]$  
Parameter that is set beforehand to control how smooth the contour should be

CHAPTER 4

$\sigma$  
Standard deviation of the distribution

$P(i,j|\Delta x,\Delta y)$  
Relative frequency separated by a pixel distance $(\Delta x, \Delta y)$

$P(i,j|d,\theta)$  
Second order probability values for changes between gray level $i$ and $j$ at distance $d$ a particular angle $\theta$

$G$  
Number of gray levels used

$\mu$  
Mean value of $P$
\[ \mu_x, \mu_y, \sigma_x, \sigma_y \] Means and Standard Deviations of \( P_x \) and \( P_y \)

\[ x(i) \] \( i \)th entry obtained by summing the rows of \( P(i,j) \)

\[ X_i \] Input vector for the \( i \)th example

\[ d_i \] Desired output for the \( i \)th example

\[ N \] Sample size used in the NN.

\[ J \] Jacobian Matrix

\[ \lambda \] Levenberg's damping factor,

\[ \nabla \] Weight update vector

\[ E \] Error Vector

\[ i=0, \ldots, N-1 \] Number of output processing elements in NN

\[ N \] Number of patterns in the training data set

\[ y_{ij} \] Estimated network emissions output for pattern \( i \) at processing element \( j \)

\[ d_{ij} \] Actual output for emissions exemplar \( i \) at processing element \( j \).

\[ T_2 \] Relaxation time (also known as the spin-lattice relaxation time) in MRI

\[ dy_{ij} \] Demoralized network emissions output for pattern \( i \) at processing element \( j \)

\[ dd_{ij} \] Demoralized desired network emissions output for exemplar \( i \) at processing element \( j \).

Chapter 5

\[ LBP_{N,R} \] basic LBP operator

\[ n_c \] the gray value of the central pixel

\[ n_i \] is the gray value of \( i \)th neighboring pixel

\[ i=0, \ldots, N-1 \] \( N \) is the total number of involved neighboring pixels

\[ R \] is the radius of the neighborhood

\[ U_p(n, r) \] histogram of the texture image
Where is the maximal LBP pattern value.

Uniform LBP operator

Using only uniform patterns

denote a specific uniform LBP pattern

The pair specifies a uniform pattern

is the rotation of the pattern

denote the rotation of image $I(x,y)$ by $\alpha$ degree

denotes the circular bitwise right rotation of bit sequence $x$ by $i$ steps

Rotation-invariant LBP Patterns

Original data set $X$ of dimension $p$

Transformed set of smaller dimension $L$

set of $n$ data vectors

an empirical mean vector of dimensions $p \times 1$

Matrix which Stores mean-subtracted data of dimension $n \times p$

an $n \times 1$ column vector of all 1s

is a $p$-by-$p$ diagonal matrix of positive numbers $\sigma_{(k)}$, called the singular values of $X$