ILLUSTRATIONS

ACC	Accuracy
CAD	Computer aided diagnosis
CP	Correlation Parameter
CT	Computed Tomography
ECT	Emission Computed Tomography (PET/SPECT)
FCM	Fuzzy c means
GCE	Global consistency error
GLCM	Gray Level co-occurrence matrix
GT	Ground truth
GVF	Gradient Vector Flow
H & E	Hematoxylin and Eosin
HOG	Histogram of oriented gradient
KNN	K-nearest neighbors.
LTE	Laws Texture Energy
MCC	Matthew's correlation coefficient
MRF	Markov Random Field
MRI	Magnetic Resonance Imaging
PDE	Partial Differential Equation
PSNR	Peak Signal to Noise Ratio
RMSE	Root Mean Square Error
ROC	Receiver operating characteristics
SNR	Signal to Noise Ratio
SVM	Support vector machine
TV	Total Variation

SYMBOLS USED

K	Number of nearest neighbors
d	Euclidian distance
n	Number of training data sets
mtry	Size of random subset of features
ntree	Number of trees in the random forest
m	Membership coefficient of fuzzy k-NN
$\sum$	Summation
2D/3D	Two/ Three dimensional
β	An isotope dependent decay constant
$\phi(\|\nabla x\|)$	Energy function defined in terms of gradient norm of the image
σ	Standard deviations
∇f	The local image gradient and
$\sum$	Summation
$\mu(s; E)$	Linear attenuation coefficient
A	$M \times N$ Projection/system matrix
b	linear vector representing a sinogram
$d(\hat{y}, \mathbf{y})$	Log-likelihood / data fit term
f	Linear vector representing recon image
f(x, y)	2D Image Slice

KEYWORDS

Cancer

Microscopic biopsy

Cancer detection

Medical image segmentation

Enhancement

Segmentation

Feature extraction

Features of microscopic biopsy images

K means

Fuzzy C means

Texture features

Random forest

K-nearest neighbor

Fuzzy k- nearest neighbor

Support vector machine

Restoration

Classification

Prediction

Pattern classification

Random forest