TEXTURE FEATURES

HISTOGRAM
Mean (histogram's mean)
Variance (histogram's variance)
Skewness (histogram's skewness)
Kurtosis (histogram's kurtosis)
Perc.01% (1% percentile)
Perc.10% (10% percentile)
Perc.50% (50% percentile)
Perc.90% (90% percentile)
Perc.99% (99% percentile)
Total number of histogram based features: 9

GRADIENT
GrMean (absolute gradient mean)
GrVariance (absolute gradient variance)
GrSkewness (absolute gradient skewness)
GrKurtosis (absolute gradient kurtosis)
GrNonZeros (percentage of pixels with nonzero gradient)
Total number of absolute gradient based features: 5

RUN LENGTH MATRIX
RLNonUni (run length nonuniformity)
GLevNonU (grey level nonuniformity)
LngREmph (long run emphasis)
ShrtREmp (short run emphasis)
Fraction (fraction of image in runs)
Features are computed for 4 (2D images) or 13 (3D images) various directions.
Total number of run length matrix based features: 20 (2D) or 65 (3D)

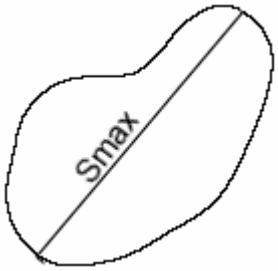
COOCURRENCE MATRIX
AngScMom (angular second moment)
Contrast (contrast)
Correlat (correlation)
SumOfSqs (sum of squares)
InvDfMom (inverse difference moment)
SumAverg (sum average)
SumVarnc (sum ariance)
SumEntrp (sum entropy)
Entropy (entropy)
DifVarnc (difference variance
DifEntrp (difference entropy)
Features are computed for 5 between-pixels distances (1, 2, 3, 4, 5) and for 4 (2D images) or 13 (3D images) various directions.
Total number of co-occurrence matrix based features: 220 (2D) or 715 (3D)

AUTOREGRESSIVE MODEL
Teta1 (parametr θ_1)
Teta2 (parametr θ_2)
Teta3 (parametr θ_3)
Teta4 (parametr θ_4)
Sigma (parametr σ)
Total number of autoregressive model based features: 5

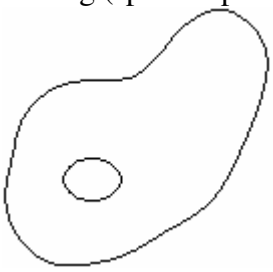
HAAR WAVELET
WavEn (wavelet energy)
Feature is computed at 5 scales within four frequency bands LL, LH, HL and HH.
Total number of Haar wavelet based features: 20

GEOMETRY PARAMETERS
GeoX (horizontal coordinate of gravity center)
GeoY (vertical coordinate of gravity center)
GeoF (area, number of the object pixels)

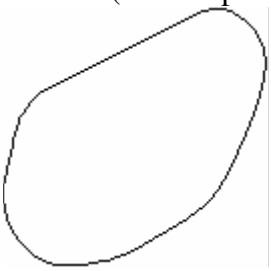
GeoSpol (diameter of the area equivalent circle)
GeoSmax (maximal diameter)



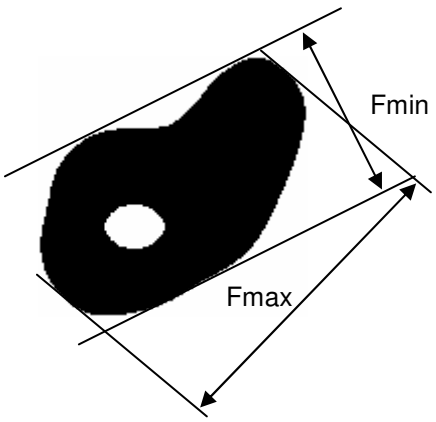
GeoAox (oriental angle)
GeoUg (specific perimeter – sum of distances between centers of neighboring contour pixels)



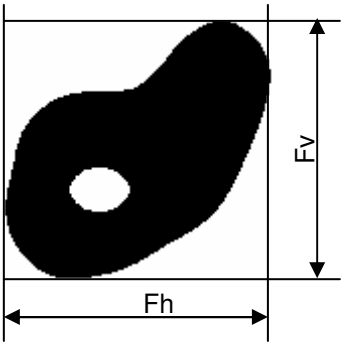
GeoUw (convex perimeter)



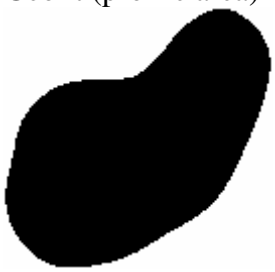
GeoFmax (maximal Feret's diameter)
GeoFmin (minimal Feret's diameter)



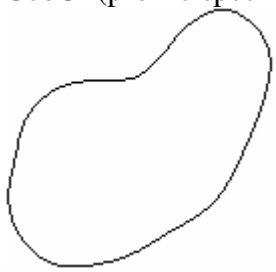
GeoFh (horizontal Feret's diameter)
GeoFv (vertical Feret's diameter)



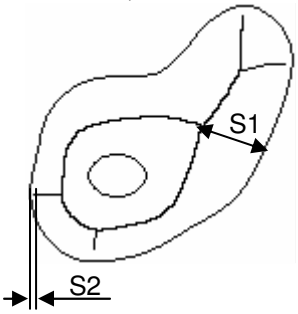
GeoMmin
(Martin's minimal radius
– minimum distance between gravity center and contour pixels)
GeoMmax
(Martin's maximal radius
– maximum distance between gravity center and contour pixels)
GeoMaver
(Martin's average radius
– average distance between gravity center and contour pixels)
GeoFt (profile area)



GeoUl (profile specific perimeter)

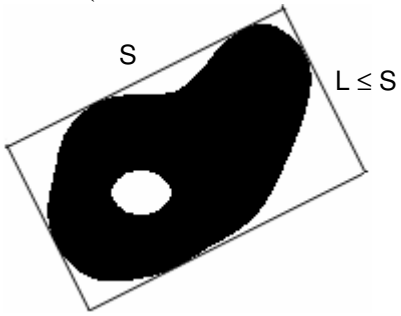


GeoS1 (contour-skeleton maximal thickness)
GeoS2 (contour-skeleton minimal distance)



GeoLsz (skeleton length)

GeoS (length of the circumscribing rectangle of minimal area)
GeoL (width of the circumscribing rectangle)



GeoSxL (area of circumscribing rectangle)
GeoD1 (diameter of profile inscribed circle of maximum area)
GeoD2 (diameter of circumscribing circle)
GeoFd2 (area of circumscribing circle)
GeoLmaxE (length of the circumscribing ellipsis of minimal area)
GeoLminE (width of the circumscribing ellipsis of minimal area)
GeoFE (area of circumscribing ellipsis)
GeoW1 (GeoLmaxE/GeoLminE)
GeoW2 (4π GeoFt / $GeoU1^2$)
GeoW6 (1 / GeoW2)
GeoW3 ($GeoU1^2$ / GeoFt)
GeoW4 (GeoU1 / GeoUw)
GeoW5 (GeoF / GeoLsz)
GeoW5b (GeoLsz / GeoF)
GeoW7 (GeoD2 / GeoD1)
GeoRs ($GeoU^2$ / 4π GeoFt)
GeoRf (GeoFh / GeoFv)
GeoRff (GeoFmax / GeoFmin)
GeoRc (circularity Rc1/Rc2)
GeoRc1

$$Rc1 = 2\sqrt{\frac{F}{\pi}}$$

GeoRc2

$$Rc2 = \frac{Ug}{\pi}$$

GeoRm (Malinowska ratio)

$$Rm = \frac{Ug}{2\sqrt{\pi F}} - 1$$

GeoRb (Blair-Bliss ratio)
GeoRd (Danielsson ratio)

GeoRh (Haralic ratio)
GeoW8 (GeoL / GeoS)
GeoW9 (GeoL GeoS / GeoF)
GeoW10 (GeoMmax / GeoMmin)
GeoSigR (standard deviation of all radii)
GeoW11 (diameter range)
GeoW12 (roundness)
GeoW13 (GeoSmax / GeoF)
GeoW14 (GeoF / $GeoSmax^3$)
GeoW15 (4 GeoF / π GeoFmin GeoFmax)
GeoM2x (horizontal second order moment of inertia)
GeoM2y (vertical second order moment of inertia)
GeoM2xy (second order moment of inertia)
GeoEr (average distance from gravity center)
GeoEr2 (average square distance from gravity center)
GeoEl (average distance from contour)
GeoEl2 (average square distance from contour)
GeoNc (number of contour pixels)
GeoNv (number of cavities)
GeoNl (number of profile contour pixels)
GeoNsz (number of skeleton pixels)
GeoNi (number of skeleton branches)
GeoNx (skeletal junction number)
GeoNo (number of skeletal loops)
GeoXo (gravity center to inscribed circle center horizontal distance)
GeoYo (gravity center to inscribed circle center distance)
GeoXYo (gravity center to inscribed circle center horizontal distance)
Total number of geometric parameters: 73