

IPSDK V 1.5.0.0 - Main image processing measures

Formula	Category	Measure information	2d/3d	version
Arithmetic Formula		Arithmetic formula measure associated to a formula string	2d and 3d	1-0-0-0
Logic Formula		Logical formula measure used during shape filtering	2d and 3d	1-0-0-0
Geometry	Category	Measure information	2d/3d	version
Area2d	Basic	Shape 2d area measurement (measure based on polygonal approximation)	2d	1-0-0-0
Area3d	Basic	Shape 3d surface area measurement (measure based on polyhedral approximation)	3d	1-2-0-0
ImageRatio	Basic	Measure allowing to compute the ratio between the shapes areas and the image area	2d and 3d	1-2-0-0
NbPixels2d	Basic	Number of pixels in shape 2d measurement	2d	1-0-0-0
NbPixels3d	Basic	Number of voxels in shape 3d measurement	3d	1-2-0-0
Perimeter2d	Basic	Shape 2d perimeter measurement (measure based on polygonal approximation)	2d and 3d	1-2-0-0
Volume3d	Basic	Shape 3d volume measurement (measure based on polyhedral approximation)	3d	1-2-0-0
BoundingBoxCenterX	BoundingBox	Measure allowing to compute the position of the centroid of the envelope along the x axis	2d and 3d	1-2-0-0
BoundingBoxCenterY	BoundingBox	Measure allowing to compute the position of the centroid of the envelope along the y axis	2d and 3d	1-2-0-0
BoundingBoxCenterZ	BoundingBox	Measure allowing to compute the position of the centroid of the envelope along the z axis	3d	1-2-0-0
BoundingBoxMaxX	BoundingBox	Measure allowing to get the shape maximum x coordinate	2d and 3d	1-2-0-0
BoundingBoxMaxY	BoundingBox	Measure allowing to get the shape maximum y coordinate	2d and 3d	1-2-0-0
BoundingBoxMaxZ	BoundingBox	Measure allowing to get the shape maximum z coordinate	3d	1-2-0-0
BoundingBoxMinX	BoundingBox	Measure allowing to get the shape minimum x coordinate	2d and 3d	1-2-0-0
BoundingBoxMinY	BoundingBox	Measure allowing to get the shape minimum y coordinate	2d and 3d	1-2-0-0
BoundingBoxMinZ	BoundingBox	Measure allowing to get the shape minimum z coordinate	3d	1-2-0-0
BoundingBoxSizeX	BoundingBox	Measure allowing to compute the size of the shape envelope along the x axis	2d and 3d	1-2-0-0
BoundingBoxSizeY	BoundingBox	Measure allowing to compute the size of the shape envelope along the y axis	2d and 3d	1-2-0-0
BoundingBoxSizeZ	BoundingBox	Measure allowing to compute the size of the shape envelope along the z axis	3d	1-2-0-0
ConvexHullArea2d	ConvexHull	Measure allowing to compute the area of the 2d convex hull for shape	2d	1-0-0-0
ConvexHullArea3d	ConvexHull	Measure allowing to compute the area of the surface of the 3d convex hull for shape	3d	1-2-0-0
ConvexHullPerimeter2d	ConvexHull	Measure allowing to compute the perimeter of the 2d convex hull for shape	2d	1-0-0-0
ConvexHullVolume3d	ConvexHull	Measure allowing to compute the volume of the 3d convex hull for shape	3d	1-2-0-0
LeastSquareBallCenterX	Fitting	x coordinates for center of least square ball associated to shape tops	2d and 3d	1-6-0-0
LeastSquareBallCenterY	Fitting	y coordinates for center of least square ball associated to shape tops	2d and 3d	1-6-0-0
LeastSquareBallCenterZ	Fitting	z coordinates for center of least square ball associated to shape tops	3d	1-6-0-0
LeastSquareBallRadius	Fitting	radius of least square ball associated to shape tops	2d and 3d	1-6-0-0
LeastSquareCircle2d	Fitting	least square circle associated to shape tops	2d	1-6-0-0
LeastSquareEllipse2d	Fitting	least square ellipse associated to shape tops	2d	1-6-0-0
LeastSquareEllipsoid3d	Fitting	least square ellipsoid associated to shape tops	3d	1-6-0-0
LeastSquareEllipsoidCenterX	Fitting	x coordinates for center of least square ellipsoid associated to shape tops	2d and 3d	1-6-0-0
LeastSquareEllipsoidCenterY	Fitting	y coordinates for center of least square ellipsoid associated to shape tops	2d and 3d	1-6-0-0
LeastSquareEllipsoidCenterZ	Fitting	z coordinates for center of least square ellipsoid associated to shape tops	3d	1-6-0-0
LeastSquareEllipsoidMajorRadius	Fitting	major radius of least square ellipsoid associated to shape tops	2d and 3d	1-6-0-0
LeastSquareEllipsoidMediumRadius	Fitting	medium radius of least square ellipsoid associated to shape tops	2d and 3d	1-6-0-0
LeastSquareEllipsoidMinorRadius	Fitting	minor radius of least square ellipsoid associated to shape tops	2d and 3d	1-6-0-0
LeastSquareHyperPlanDistanceToOrigin	Fitting	distance to origin for least square hyper plan (line 2d or plan 3d) associated to shape tops	2d and 3d	1-6-0-0
LeastSquareHyperPlanNormalX	Fitting	x component of normal for least square hyper plan (line 2d or plan 3d) associated to shape tops	2d and 3d	1-6-0-0
LeastSquareHyperPlanNormalY	Fitting	y component of normal for least square hyper plan (line 2d or plan 3d) associated to shape tops	2d and 3d	1-6-0-0
LeastSquareHyperPlanNormalZ	Fitting	z component of normal for least square hyper plan (line 2d or plan 3d) associated to shape tops	3d	1-6-0-0
LeastSquareLine2d	Fitting	least square line 2d associated to shape tops	2d	1-6-0-0
LeastSquarePlan3d	Fitting	least square plan 3d associated to shape tops	3d	1-6-0-0
LeastSquareSphere3d	Fitting	least square sphere 3d associated to shape tops	3d	1-6-0-0
MaxInscribedBallCenterX	Fitting	x coordinates for center of ball of maximum radius enclosed by shape	2d	1-6-0-0
MaxInscribedBallCenterY	Fitting	y coordinates for center of ball of maximum radius enclosed by shape	2d	1-6-0-0
MaxInscribedBallRadius	Fitting	radius of ball of maximum radius enclosed by shape	2d	1-6-0-0
MaxInscribedCircle2d	Fitting	circle of maximum radius enclosed by shape	2d and 3d	1-6-0-0
MinEnclosingBallCenterX	Fitting	x coordinates for center of ball of minimum radius enclosing shape	2d and 3d	1-6-0-0
MinEnclosingBallCenterY	Fitting	y coordinates for center of ball of minimum radius enclosing shape	2d and 3d	1-6-0-0
MinEnclosingBallCenterZ	Fitting	z coordinates for center of ball of minimum radius enclosing shape	3d	1-6-0-0
MinEnclosingBallRadius	Fitting	radius of ball of minimum radius enclosing shape	2d and 3d	1-6-0-0
MinEnclosingCircle2d	Fitting	circle of minimum radius enclosing shape	2d and 3d	1-6-0-0
MinEnclosingSphere3d	Fitting	sphere of minimum radius enclosing shape	2d and 3d	1-6-0-0
Aspect Ratio	FormFactor	Measure the aspect ratio of a 2d/3d shape (measure based on polygonal/polyhedral approximation)	2d and 3d	1-2-0-0
Circularity2d	FormFactor	Compute the circularity of a shape	2d	1-0-0-0
Convexity	FormFactor	Measure the convexity of a shape	2d and 3d	1-2-0-0
EquivalentRay	FormFactor	Compute ray of equivalent 2d circle or 3d sphere (circle with same area or sphere with same volume)	2d and 3d	1-2-0-0
Extent	FormFactor	Measure the extent of an object into its bounding box	2d and 3d	1-2-0-0
FeretDiameter2d	FormFactor	Compute, for a given orientation, Feret diameter on 2d shape (measure based on polygonal approximation)	2d	1-0-0-0
FeretDiameter3d	FormFactor	Compute, for a given orientation, Feret diameter on 3d shape (measure based on polyhedral approximation)	3d	1-2-0-0
MaxFeretDiameter	FormFactor	Compute the maximal Feret diameter over a uniformly distributed range of orientations (measure based on polygonal/polyhedral approximation)	2d and 3d	1-2-0-0
MeanFeretDiameter	FormFactor	Compute the mean of Feret diameters over a uniformly distributed range of orientations (measure based on polygonal/polyhedral approximation)	2d and 3d	1-2-0-0

MinFeretDiameter	FormFactor	Compute the minimal Feret diameter over a uniformly distributed range of orientations (measure based on polygonal/polyhedral approximation)	2d and 3d	1-2-0-0
RelativeSize	FormFactor	Measure allowing to get the number of shapes equivalent to the shape with minimum area	2d and 3d	1-2-0-0
Sphericity3d	FormFactor	Compute the sphericity of a 3d shape	3d	1-2-0-0
Eccentricity2d	Inertia	Measure eccentricity of the ellipse that has the same second moments as 2d shape	2d	1-2-0-0
Barycenter2d	Inertia	Measure allowing to compute the barycenter for 2d shape	2d	1-0-0-0
Barycenter3d	Inertia	Measure allowing to compute the barycenter for 3d shape	3d	1-2-0-0
BarycenterX	Inertia	Measure allowing to compute the x-component of the barycenter for a shape	2d and 3d	1-4-0-0
BarycenterY	Inertia	Measure allowing to compute the y-component of the barycenter for a shape	2d and 3d	1-4-0-0
BarycenterZ	Inertia	Measure allowing to compute the z-component of the barycenter for 3d shape	3d	1-4-0-0
Inertia2d	Inertia	Measure allowing to compute the second order moment for 2d shape	2d	1-0-0-0
Inertia3d	Inertia	Measure allowing to compute the second order moment for 3d shape	3d	1-2-0-0
InertiaLambdaInter	Inertia	Measure allowing to compute the intermediary eigen value from the second order moment matrix computed from the Inertia measurement for shape	3d	1-2-0-0
InertiaLambdaMax	Inertia	Measure allowing to compute the maximum eigen value from the second order moment matrix computed from the Inertia measurement for shape	2d and 3d	1-2-0-0
InertiaLambdaMin	Inertia	Measure allowing to compute the minimum eigen value from the second order moment matrix computed from the Inertia measurement for shape	2d and 3d	1-2-0-0
InertiaOrientation2d	Inertia	Measure allowing to compute the shape orientation from the second order moment matrix computed from the Inertia2d measurement for 2d shape	2d	1-0-0-0
InertiaOrientationAlpha	Inertia	Measure allowing to compute the alpha component of the shape orientation from the second order moment matrix computed from the Inertia measurement for 3d shape	3d	1-2-0-0
InertiaOrientationBeta	Inertia	Measure allowing to compute the beta component of the shape orientation from the second order moment matrix computed from the Inertia measurement for 3d shape	3d	1-2-0-0
InertiaOrientationChi	Inertia	Measure allowing to compute the chi component of the shape orientation from the second order moment matrix computed from the Inertia measurement for 3d shape	3d	1-2-0-0
Flatness2d	Metrology	computation of distance from shape tops to considered line	2d and 3d	1-6-0-0
Flatness3d	Metrology	computation of distance from shape tops to considered plan	2d and 3d	1-6-0-0
FlatnessPeak	Metrology	out of flatness highest peak given measure reference hyper plan	2d and 3d	1-6-0-0
FlatnessTotal	Metrology	out of flatness expressed as difference between highest peak and lowest valley given measure reference hyper plan	2d and 3d	1-6-0-0
FlatnessValley	Metrology	out of flatness lowest valley given measure reference hyper plan	2d and 3d	1-6-0-0
Roundness2d	Metrology	computation of distance from shape tops to considered circle	2d and 3d	1-6-0-0
Roundness3d	Metrology	computation of distance from shape tops to considered sphere	2d and 3d	1-6-0-0
RoundnessPeak	Metrology	out of roundness highest peak given measure reference ball	2d and 3d	1-6-0-0
RoundnessTotal	Metrology	out of roundness expressed as difference between highest peak and lowest valley given measure reference ball	2d and 3d	1-6-0-0
RoundnessValley	Metrology	out of roundness lowest valley given measure reference ball	2d and 3d	1-6-0-0
DistanceToNearestNeighbor	Neighborhood	computation of distance to nearest neighbor for each shape	2d and 3d	1-6-0-0
LengthOfContact	Neighborhood	measure allowing to compute length of contact between shapes	2d	1-6-0-0
NbNeighbors	Neighborhood	measure allowing to compute number of neighbors of shapes given a distance threshold	2d and 3d	1-6-0-0
NearestNeighbors	Neighborhood	measure allowing to retrieve shapes at a given distance of measured shape	2d and 3d	1-6-0-0
SurfaceOfContact	Neighborhood	measure allowing to compute surface of contact between shapes	3d	1-6-0-0
OBBCenterX	OrientedBoundingBox	Measure allowing to compute the position of the centroid of the minimal oriented bounding box along the x axis	2d and 3d	1-2-0-0
OBBCenterY	OrientedBoundingBox	Measure allowing to compute the position of the centroid of the minimal oriented bounding box along the y axis	2d and 3d	1-2-0-0
OBBCenterZ	OrientedBoundingBox	Measure allowing to compute the position of the centroid of the minimal oriented bounding box along the z axis	3d	1-2-0-0
OBBLength	OrientedBoundingBox	Measure allowing to get the length of the minimal oriented bounding box of a shape	2d and 3d	1-2-0-0
OBBWidth	OrientedBoundingBox	Measure allowing to get the width of the minimal oriented bounding box of a shape	2d and 3d	1-2-0-0
OBBHeight	OrientedBoundingBox	Measure allowing to get the height of the minimal oriented bounding box of a shape	3d	1-2-0-0
OBBOrientation2d	OrientedBoundingBox	Measure allowing to get the orientation of the minimal oriented bounding box of a 2d shape	2d	1-0-0-0
OBBOrientationAlpha	OrientedBoundingBox	Measure allowing to get the alpha component of the orientation of the minimal oriented bounding box of a 3d shape	3d	1-2-0-0
OBBOrientationBeta	OrientedBoundingBox	Measure allowing to get the beta component of the orientation of the minimal oriented bounding box of a 3d shape	3d	1-2-0-0
OBBOrientationChi	OrientedBoundingBox	Measure allowing to get the chi component of the orientation of the minimal oriented bounding box of a 3d shape	3d	1-2-0-0
OrientedExtent	FormFactor	Measure the extent of an object into its oriented bounding box	2d and 3d	1-2-0-0
NbHoles	Porosity	Compute number of holes associated to shape	2d and 3d	1-2-0-0
Roughness2d	FormFactor	Compute roughness associated to 2d shapes	2d	1-6-0-0
Skeleton2dDiameterLength	Skeleton	Length of the longest shortest path between any two skeleton 2d vertices	2d	1-4-0-0
Skeleton2dDiameterMeanCurvature	Skeleton	Mean curvature of the longest shortest path between any two skeleton 2d vertices	2d	1-4-0-0
Skeleton2dDiameterTortuosity	Skeleton	Tortuosity of the longest shortest path between any two skeleton 2d vertices	2d	1-4-0-0
Skeleton2dLength	Skeleton	Length of graph associated to skeleton 2d	2d	1-4-0-0
Skeleton2dMaxThickness	Skeleton	Maximum thickness of shape 2d defined using branches of its skeleton	2d	1-4-0-0
Skeleton2dMeanEdgeLength	Skeleton	Mean edge length for graph associated to skeleton 2d	2d	1-4-0-0
Skeleton2dMeanThickness	Skeleton	Mean thickness of shape 2d defined using branches of its skeleton	2d	1-4-0-0
Skeleton2dMinThickness	Skeleton	Minimum thickness of shape 2d defined using branches of its skeleton	2d	1-4-0-0
Skeleton2dNbVertex	Skeleton	Number of vertex in graph associated to skeleton 2d	2d	1-4-0-0
Porosity	Porosity	Material porosity measurement : fraction of the volume of voids over the total volume	2d and 3d	1-2-0-0

Intensity	Category	Measure information	2d/3d	version
Histogram	Histogram	Measure of intensity histogram for shape	2d and 3d	1-2-0-0
HistogramMostPopulatedGL	Histogram	Compute the intensity of the most populated class	2d and 3d	1-2-0-0
HistogramPopulationMax	Histogram	Compute the population of the most populated class	2d and 3d	1-2-0-0
HistogramQuantile	Histogram	Gives the quantile of the intensity histogram	2d and 3d	1-2-0-0
GreyBarycenter	Inertia	Measure allowing to compute the barycenter ponderated by the gray level of each pixel for shape	2d and 3d	1-2-0-0
GreyBarycenterX	Inertia	Measure allowing to compute the x-component of the barycenter ponderated by the gray level of each pixel for shape	2d and 3d	1-4-0-0
GreyBarycenterY	Inertia	Measure allowing to compute the y-component of the barycenter ponderated by the gray level of each pixel for shape	2d and 3d	1-4-0-0
GreyBarycenterZ	Inertia	Measure allowing to compute the z-component of the barycenter ponderated by the gray level of each pixel for shape	3d	1-4-0-0
GreyInertia	Inertia	Measure allowing to compute the second order moment ponderated by the gray level of each pixel for shape	2d and 3d	1-2-0-0
GreyInertiaLambdaInter	Inertia	Measure allowing to compute the intermediary eigen value from the second order moment matrix computed from the GreyInertia measurement for shape	3d	1-2-0-0
GreyInertiaLambdaMax	Inertia	Measure allowing to compute the maximum eigen value from the second order moment matrix computed from the GreyInertia measurement for shape	2d and 3d	1-2-0-0
GreyInertiaLambdaMin	Inertia	Measure allowing to compute the minimum eigen value from the second order moment matrix computed from the GreyInertia measurement for shape	2d and 3d	1-2-0-0
GreyInertiaOrientation2d	Inertia	Measure allowing to compute the shape orientation from the second order moment matrix computed from the GreyInertia2d measurement for 2d shape	2d	1-0-0-0
GreyInertiaOrientationAlpha	Inertia	Measure allowing to compute the alpha component of the shape orientation from the second order moment matrix computed from the GreyInertia measurement for 3d shape	3d	1-2-0-0

GreyInertiaOrientationBeta	Inertia	Measure allowing to compute the beta component of the shape orientation from the second order moment matrix computed from the GreyInertia measurement for 3d shape	3d	1-2-0-0
GreyInertiaOrientationChi	Inertia	Measure allowing to compute the chi component of the shape orientation from the second order moment matrix computed from the GreyInertia measurement for 3d shape	3d	1-2-0-0
GreyMoments	Inertia	Measure allowing to compute the zeroth to the third moment ponderated by the gray level of each pixel for shape	2d and 3d	1-5-0-0
Entropy	Statistics	Measure allowing to compute entropy of intensities for shape	2d and 3d	1-5-0-0
Energy	Statistics	Measure allowing to compute energy of intensities for shape	2d and 3d	1-5-0-0
LocalHistogram	Statistics	Measure allowing to compute the local histogram of intensities for shape	2d and 3d	1-5-0-0
Kurtosis	Statistics	Measure allowing to compute kurtosis of intensities for shape	2d and 3d	1-2-0-0
Max	Statistics	Measure allowing to compute maximum of intensities for shape	2d and 3d	1-2-0-0
MaxAbs	Statistics	Measure allowing to compute maximum of the absolute values of the intensities for shape	2d and 3d	1-2-0-0
Mean	Statistics	Allowing to compute mean of intensities for shape	2d and 3d	1-2-0-0
Median	Statistics	Measure allowing to compute median of intensities for shape	2d and 3d	1-2-0-0
Min	Statistics	Measure allowing to compute minimum of intensities for shape	2d and 3d	1-2-0-0
MinAbs	Statistics	Measure allowing to compute minimum of the absolute values of the intensities for shape	2d and 3d	1-2-0-0
Skewness	Statistics	Measure allowing to compute skewness of intensities for shape	2d and 3d	1-2-0-0
StdDev	Statistics	Measure allowing to compute standard deviation of intensities for shape	2d and 3d	1-2-0-0
Sum	Statistics	Measure allowing to compute sum of intensities for shape	2d and 3d	1-2-0-0
SumSquare	Statistics	Measure allowing to compute sum of squares of intensities for shape	2d and 3d	1-2-0-0
Variance	Statistics	Measure allowing to compute variance of intensities for shape	2d and 3d	1-2-0-0