Functions in Image Processing Toolbox

 By Category | [Alphabetical List](http://www.mathworks.in/help/images/functionlist-alpha.html)

**Import, Export, and Conversion**

**Basic Import and Export**

|  |  |
| --- | --- |
| [imread](http://www.mathworks.in/help/matlab/ref/imread.html) | Read image from graphics file |
| [imwrite](http://www.mathworks.in/help/matlab/ref/imwrite.html) | Write image to graphics file |
| [imfinfo](http://www.mathworks.in/help/matlab/ref/imfinfo.html) | Information about graphics file |

**Scientific File Formats**

|  |  |
| --- | --- |
| [dicomanon](http://www.mathworks.in/help/images/ref/dicomanon.html) | Anonymize DICOM file |
| [dicomdict](http://www.mathworks.in/help/images/ref/dicomdict.html) | Get or set active DICOM data dictionary |
| [dicominfo](http://www.mathworks.in/help/images/ref/dicominfo.html) | Read metadata from DICOM message |
| [dicomlookup](http://www.mathworks.in/help/images/ref/dicomlookup.html) | Find attribute in DICOM data dictionary |
| [dicomread](http://www.mathworks.in/help/images/ref/dicomread.html) | Read DICOM image |
| [dicomuid](http://www.mathworks.in/help/images/ref/dicomuid.html) | Generate DICOM unique identifier |
| [dicomwrite](http://www.mathworks.in/help/images/ref/dicomwrite.html) | Write images as DICOM files |
| [nitfinfo](http://www.mathworks.in/help/images/ref/nitfinfo.html) | Read metadata from National Imagery Transmission Format (NITF) file |
| [nitfread](http://www.mathworks.in/help/images/ref/nitfread.html) | Read image from NITF file |
| [analyze75info](http://www.mathworks.in/help/images/ref/analyze75info.html) | Read metadata from header file of Analyze 7.5 data set |
| [analyze75read](http://www.mathworks.in/help/images/ref/analyze75read.html) | Read image data from image file of Analyze 7.5 data set |
| [interfileinfo](http://www.mathworks.in/help/images/ref/interfileinfo.html) | Read metadata from Interfile file |
| [interfileread](http://www.mathworks.in/help/images/ref/interfileread.html) | Read images in Interfile format |

**High Dynamic Range Images**

|  |  |
| --- | --- |
| [hdrread](http://www.mathworks.in/help/images/ref/hdrread.html) | Read high dynamic range (HDR) image |
| [hdrwrite](http://www.mathworks.in/help/images/ref/hdrwrite.html) | Write Radiance high dynamic range (HDR) image file |
| [makehdr](http://www.mathworks.in/help/images/ref/makehdr.html) | Create high dynamic range image |
| [tonemap](http://www.mathworks.in/help/images/ref/tonemap.html) | Render high dynamic range image for viewing |

**Large Image Files**

|  |  |
| --- | --- |
| [ImageAdapter](http://www.mathworks.in/help/images/ref/imageadapterclass.html) | Interface for image I/O |
| [isrset](http://www.mathworks.in/help/images/ref/isrset.html) | Check if file is R-Set |
| [openrset](http://www.mathworks.in/help/images/ref/openrset.html) | Open R-Set file |
| [rsetwrite](http://www.mathworks.in/help/images/ref/rsetwrite.html) | Create reduced resolution data set from image file |

**Image Type Conversion**

|  |  |
| --- | --- |
| [gray2ind](http://www.mathworks.in/help/images/ref/gray2ind.html) | Convert grayscale or binary image to indexed image |
| [ind2gray](http://www.mathworks.in/help/images/ref/ind2gray.html) | Convert indexed image to grayscale image |
| [mat2gray](http://www.mathworks.in/help/images/ref/mat2gray.html) | Convert matrix to grayscale image |
| [rgb2gray](http://www.mathworks.in/help/images/ref/rgb2gray.html) | Convert RGB image or colormap to grayscale |
| [ind2rgb](http://www.mathworks.in/help/images/ref/ind2rgb.html) | Convert indexed image to RGB image |
| [label2rgb](http://www.mathworks.in/help/images/ref/label2rgb.html) | Convert label matrix into RGB image |
| [demosaic](http://www.mathworks.in/help/images/ref/demosaic.html) | Convert Bayer pattern encoded image to truecolor image |
| [imquantize](http://www.mathworks.in/help/images/ref/imquantize.html) | Quantize image using specified quantization levels and output values |
| [multithresh](http://www.mathworks.in/help/images/ref/multithresh.html) | Multilevel image thresholds using Otsu method |
| [im2bw](http://www.mathworks.in/help/images/ref/im2bw.html) | Convert image to binary image, based on threshold |
| [graythresh](http://www.mathworks.in/help/images/ref/graythresh.html) | Global image threshold using Otsu's method |
| [grayslice](http://www.mathworks.in/help/images/ref/grayslice.html) | Convert grayscale image to indexed image using multilevel thresholding |
| [im2double](http://www.mathworks.in/help/images/ref/im2double.html) | Convert image to double precision |
| [im2int16](http://www.mathworks.in/help/images/ref/im2int16.html) | Convert image to 16-bit signed integers |
| [im2java2d](http://www.mathworks.in/help/images/ref/im2java2d.html) | Convert image to Java buffered image |
| [im2single](http://www.mathworks.in/help/images/ref/im2single.html) | Convert image to single precision |
| [im2uint16](http://www.mathworks.in/help/images/ref/im2uint16.html) | Convert image to 16-bit unsigned integers |
| [im2uint8](http://www.mathworks.in/help/images/ref/im2uint8.html) | Convert image to 8-bit unsigned integers |

**Synthetic Images**

|  |  |
| --- | --- |
| [checkerboard](http://www.mathworks.in/help/images/ref/checkerboard.html) | Create checkerboard image |
| [phantom](http://www.mathworks.in/help/images/ref/phantom.html) | Create head phantom image |
| [imnoise](http://www.mathworks.in/help/images/ref/imnoise.html) | Add noise to image |

**Display and Exploration**

**Basic Display**

|  |  |
| --- | --- |
| [imshow](http://www.mathworks.in/help/images/ref/imshow.html) | Display image |
| [montage](http://www.mathworks.in/help/images/ref/montage.html) | Display multiple image frames as rectangular montage |
| [subimage](http://www.mathworks.in/help/images/ref/subimage.html) | Display multiple images in single figure |
| [immovie](http://www.mathworks.in/help/images/ref/immovie.html) | Make movie from multiframe image |
| [implay](http://www.mathworks.in/help/images/ref/implay.html) | Play movies, videos, or image sequences |
| [warp](http://www.mathworks.in/help/images/ref/warp.html) | Display image as texture-mapped surface |
| [iptgetpref](http://www.mathworks.in/help/images/ref/iptgetpref.html) | Get values of Image Processing Toolbox preferences |
| [iptprefs](http://www.mathworks.in/help/images/ref/iptprefs.html) | Display Image Processing Preferences dialog box |
| [iptsetpref](http://www.mathworks.in/help/images/ref/iptsetpref.html) | Set Image Processing Toolbox preferences or display valid values |

**Interactive Exploration with the Image Tool**

|  |  |
| --- | --- |
| [imtool](http://www.mathworks.in/help/images/ref/imtool.html) | Image Tool |
| [imageinfo](http://www.mathworks.in/help/images/ref/imageinfo.html) | Image Information tool |
| [imcontrast](http://www.mathworks.in/help/images/ref/imcontrast.html) | Adjust Contrast tool |
| [imdisplayrange](http://www.mathworks.in/help/images/ref/imdisplayrange.html) | Display Range tool |
| [imdistline](http://www.mathworks.in/help/images/ref/imdistline.html) | Distance tool |
| [impixelinfo](http://www.mathworks.in/help/images/ref/impixelinfo.html) | Pixel Information tool |
| [impixelinfoval](http://www.mathworks.in/help/images/ref/impixelinfoval.html) | Pixel Information tool without text label |
| [impixelregion](http://www.mathworks.in/help/images/ref/impixelregion.html) | Pixel Region tool |
| [immagbox](http://www.mathworks.in/help/images/ref/immagbox.html) | Magnification box for scroll panel |
| [imoverview](http://www.mathworks.in/help/images/ref/imoverview.html) | Overview tool for image displayed in scroll panel |
| [iptgetpref](http://www.mathworks.in/help/images/ref/iptgetpref.html) | Get values of Image Processing Toolbox preferences |
| [iptprefs](http://www.mathworks.in/help/images/ref/iptprefs.html) | Display Image Processing Preferences dialog box |
| [iptsetpref](http://www.mathworks.in/help/images/ref/iptsetpref.html) | Set Image Processing Toolbox preferences or display valid values |

**Build Interactive Tools**

|  |  |
| --- | --- |
| [imageinfo](http://www.mathworks.in/help/images/ref/imageinfo.html) | Image Information tool |
| [imcolormaptool](http://www.mathworks.in/help/images/ref/imcolormaptool.html) | Choose Colormap tool |
| [imcontrast](http://www.mathworks.in/help/images/ref/imcontrast.html) | Adjust Contrast tool |
| [imcrop](http://www.mathworks.in/help/images/ref/imcrop.html) | Crop image |
| [imdisplayrange](http://www.mathworks.in/help/images/ref/imdisplayrange.html) | Display Range tool |
| [imdistline](http://www.mathworks.in/help/images/ref/imdistline.html) | Distance tool |
| [impixelinfo](http://www.mathworks.in/help/images/ref/impixelinfo.html) | Pixel Information tool |
| [impixelinfoval](http://www.mathworks.in/help/images/ref/impixelinfoval.html) | Pixel Information tool without text label |
| [impixelregion](http://www.mathworks.in/help/images/ref/impixelregion.html) | Pixel Region tool |
| [impixelregionpanel](http://www.mathworks.in/help/images/ref/impixelregionpanel.html) | Pixel Region tool panel |
| [immagbox](http://www.mathworks.in/help/images/ref/immagbox.html) | Magnification box for scroll panel |
| [imoverview](http://www.mathworks.in/help/images/ref/imoverview.html) | Overview tool for image displayed in scroll panel |
| [imoverviewpanel](http://www.mathworks.in/help/images/ref/imoverviewpanel.html) | Overview tool panel for image displayed in scroll panel |
| [imsave](http://www.mathworks.in/help/images/ref/imsave.html) | Save Image Tool |
| [imscrollpanel](http://www.mathworks.in/help/images/ref/imscrollpanel.html) | Scroll panel for interactive image navigation |
| [imellipse](http://www.mathworks.in/help/images/ref/imellipse.html) | Create draggable ellipse |
| [imfreehand](http://www.mathworks.in/help/images/ref/imfreehand.html) | Create draggable freehand region |
| [imline](http://www.mathworks.in/help/images/ref/imline.html) | Create draggable, resizable line |
| [impoint](http://www.mathworks.in/help/images/ref/impoint.html) | Create draggable point |
| [impoly](http://www.mathworks.in/help/images/ref/impoly.html) | Create draggable, resizable polygon |
| [imrect](http://www.mathworks.in/help/images/ref/imrect.html) | Create draggable rectangle |
| [imroi](http://www.mathworks.in/help/images/ref/imroi.html) | Region-of-interest (ROI) base class |
| [getline](http://www.mathworks.in/help/images/ref/getline.html) | Select polyline with mouse |
| [getpts](http://www.mathworks.in/help/images/ref/getpts.html) | Specify points with mouse |
| [getrect](http://www.mathworks.in/help/images/ref/getrect.html) | Specify rectangle with mouse |
| [getimage](http://www.mathworks.in/help/images/ref/getimage.html) | Image data from axes |
| [getimagemodel](http://www.mathworks.in/help/images/ref/getimagemodel.html) | Image model object from image object |
| [axes2pix](http://www.mathworks.in/help/images/ref/axes2pix.html) | Convert axes coordinates to pixel coordinates |
| [imattributes](http://www.mathworks.in/help/images/ref/imattributes.html) | Information about image attributes |
| [imgca](http://www.mathworks.in/help/images/ref/imgca.html) | Get handle to current axes containing image |
| [imgcf](http://www.mathworks.in/help/images/ref/imgcf.html) | Get handle to current figure containing image |
| [imgetfile](http://www.mathworks.in/help/images/ref/imgetfile.html) | Open Image dialog box |
| [imhandles](http://www.mathworks.in/help/images/ref/imhandles.html) | Get all image handles |
| [iptaddcallback](http://www.mathworks.in/help/images/ref/iptaddcallback.html) | Add function handle to callback list |
| [iptcheckhandle](http://www.mathworks.in/help/images/ref/iptcheckhandle.html) | Check validity of handle |
| [iptgetapi](http://www.mathworks.in/help/images/ref/iptgetapi.html) | Get Application Programmer Interface (API) for handle |
| [iptGetPointerBehavior](http://www.mathworks.in/help/images/ref/iptgetpointerbehavior.html) | Retrieve pointer behavior from HG object |
| [ipticondir](http://www.mathworks.in/help/images/ref/ipticondir.html) | Directories containing IPT and MATLAB icons |
| [iptPointerManager](http://www.mathworks.in/help/images/ref/iptpointermanager.html) | Create pointer manager in figure |
| [iptremovecallback](http://www.mathworks.in/help/images/ref/iptremovecallback.html) | Delete function handle from callback list |
| [iptSetPointerBehavior](http://www.mathworks.in/help/images/ref/iptsetpointerbehavior.html) | Store pointer behavior structure in Handle Graphics object |
| [iptwindowalign](http://www.mathworks.in/help/images/ref/iptwindowalign.html) | Align figure windows |
| [makeConstrainToRectFcn](http://www.mathworks.in/help/images/ref/makeconstraintorectfcn.html) | Create rectangularly bounded drag constraint function |
| [truesize](http://www.mathworks.in/help/images/ref/truesize.html) | Adjust display size of image |

**Geometric Transformation, Spatial Referencing, and Image Registration**

**Geometric Transformations**

|  |  |
| --- | --- |
| [imcrop](http://www.mathworks.in/help/images/ref/imcrop.html) | Crop image |
| [imresize](http://www.mathworks.in/help/images/ref/imresize.html) | Resize image |
| [imrotate](http://www.mathworks.in/help/images/ref/imrotate.html) | Rotate image |
| [impyramid](http://www.mathworks.in/help/images/ref/impyramid.html) | Image pyramid reduction and expansion |
| [imwarp](http://www.mathworks.in/help/images/ref/imwarp.html) | Apply geometric transformation to image |
| [fitgeotrans](http://www.mathworks.in/help/images/ref/fitgeotrans.html) | Fit geometric transformation to control point pairs |
| [imtransform](http://www.mathworks.in/help/images/ref/imtransform.html) | Apply 2-D spatial transformation to image |
| [findbounds](http://www.mathworks.in/help/images/ref/findbounds.html) | Find output bounds for spatial transformation |
| [fliptform](http://www.mathworks.in/help/images/ref/fliptform.html) | Flip input and output roles of TFORM structure |
| [makeresampler](http://www.mathworks.in/help/images/ref/makeresampler.html) | Create resampling structure |
| [maketform](http://www.mathworks.in/help/images/ref/maketform.html) | Create spatial transformation structure (TFORM) |
| [tformarray](http://www.mathworks.in/help/images/ref/tformarray.html) | Apply spatial transformation to N-D array |
| [tformfwd](http://www.mathworks.in/help/images/ref/tformfwd.html) | Apply forward spatial transformation |
| [tforminv](http://www.mathworks.in/help/images/ref/tforminv.html) | Apply inverse spatial transformation |
| [checkerboard](http://www.mathworks.in/help/images/ref/checkerboard.html) | Create checkerboard image |
| [affine2d](http://www.mathworks.in/help/images/ref/affine2dclass.html) | 2-D Affine Geometric Transformation |
| [affine3d](http://www.mathworks.in/help/images/ref/affine3dclass.html) | 3-D Affine Geometric Transformation |
| [projective2d](http://www.mathworks.in/help/images/ref/projective2dclass.html) | 2-D Projective Geometric Transformation |
| [images.geotrans.PiecewiseLinearTransformation2D](http://www.mathworks.in/help/images/ref/images.geotrans.piecewiselineartransformation2dclass.html) | 2-D piecewise linear geometric transformation |
| [images.geotrans.PolynomialTransformation2D](http://www.mathworks.in/help/images/ref/images.geotrans.polynomialtransformation2dclass.html) | 2-D Polynomial Geometric Transformation |
| [images.geotrans.LocalWeightedMeanTransformation2D](http://www.mathworks.in/help/images/ref/images.geotrans.localweightedmeantransformation2dclass.html) | 2-D Local Weighted Mean Geometric Transformation |

**Spatial Referencing**

|  |  |
| --- | --- |
| [imwarp](http://www.mathworks.in/help/images/ref/imwarp.html) | Apply geometric transformation to image |
| [imregister](http://www.mathworks.in/help/images/ref/imregister.html) | Intensity-based image registration |
| [imregtform](http://www.mathworks.in/help/images/ref/imregtform.html) | Estimate geometric transformation that aligns two 2-D or 3-D images |
| [imshow](http://www.mathworks.in/help/images/ref/imshow.html) | Display image |
| [imshowpair](http://www.mathworks.in/help/images/ref/imshowpair.html) | Compare differences between images |
| [imfuse](http://www.mathworks.in/help/images/ref/imfuse.html) | Composite of two images |
| [imref2d](http://www.mathworks.in/help/images/ref/imref2dclass.html) | Reference 2-D image to world coordinates |
| [imref3d](http://www.mathworks.in/help/images/ref/imref3dclass.html) | Reference 3-D image to world coordinates |

**Automatic Registration**

|  |  |
| --- | --- |
| [imregister](http://www.mathworks.in/help/images/ref/imregister.html) | Intensity-based image registration |
| [imregconfig](http://www.mathworks.in/help/images/ref/imregconfig.html) | Configurations for intensity-based registration |
| [imregtform](http://www.mathworks.in/help/images/ref/imregtform.html) | Estimate geometric transformation that aligns two 2-D or 3-D images |
| [imfuse](http://www.mathworks.in/help/images/ref/imfuse.html) | Composite of two images |
| [imshowpair](http://www.mathworks.in/help/images/ref/imshowpair.html) | Compare differences between images |
| [registration.metric.MattesMutualInformation](http://www.mathworks.in/help/images/ref/registration.metric.mattesmutualinformationclass.html) | Mattes mutual information metric configuration object |
| [registration.metric.MeanSquares](http://www.mathworks.in/help/images/ref/registration.metric.meansquaresclass.html) | Mean square error metric configuration object |
| [registration.optimizer.RegularStepGradientDescent](http://www.mathworks.in/help/images/ref/registration.optimizer.regularstepgradientdescentclass.html) | Regular step gradient descent optimizer configuration object |
| [registration.optimizer.OnePlusOneEvolutionary](http://www.mathworks.in/help/images/ref/registration.optimizer.oneplusoneevolutionaryclass.html) | One-plus-one evolutionary optimizer configuration object |

**Control Point Registration**

|  |  |
| --- | --- |
| [cpselect](http://www.mathworks.in/help/images/ref/cpselect.html) | Control Point Selection Tool |
| [fitgeotrans](http://www.mathworks.in/help/images/ref/fitgeotrans.html) | Fit geometric transformation to control point pairs |
| [cpcorr](http://www.mathworks.in/help/images/ref/cpcorr.html) | Tune control-point locations using cross correlation |
| [cpstruct2pairs](http://www.mathworks.in/help/images/ref/cpstruct2pairs.html) | Convert CPSTRUCT to valid pairs of control points |
| [normxcorr2](http://www.mathworks.in/help/images/ref/normxcorr2.html) | Normalized 2-D cross-correlation |
| [cp2tform](http://www.mathworks.in/help/images/ref/cp2tform.html) | Infer spatial transformation from control point pairs |

**Image Enhancement**

**Contrast Adjustment**

|  |  |
| --- | --- |
| [imadjust](http://www.mathworks.in/help/images/ref/imadjust.html) | Adjust image intensity values or colormap |
| [imcontrast](http://www.mathworks.in/help/images/ref/imcontrast.html) | Adjust Contrast tool |
| [imsharpen](http://www.mathworks.in/help/images/ref/imsharpen.html) | Sharpen image using unsharp masking |
| [histeq](http://www.mathworks.in/help/images/ref/histeq.html) | Enhance contrast using histogram equalization |
| [adapthisteq](http://www.mathworks.in/help/images/ref/adapthisteq.html) | Contrast-limited adaptive histogram equalization (CLAHE) |
| [imhistmatch](http://www.mathworks.in/help/images/ref/imhistmatch.html) | Adjust histogram of image to match N-bin histogram of reference image |
| [decorrstretch](http://www.mathworks.in/help/images/ref/decorrstretch.html) | Apply decorrelation stretch to multichannel image |
| [stretchlim](http://www.mathworks.in/help/images/ref/stretchlim.html) | Find limits to contrast stretch image |
| [intlut](http://www.mathworks.in/help/images/ref/intlut.html) | Convert integer values using lookup table |
| [imnoise](http://www.mathworks.in/help/images/ref/imnoise.html) | Add noise to image |

**ROI-Based Processing**

|  |  |
| --- | --- |
| [roipoly](http://www.mathworks.in/help/images/ref/roipoly.html) | Specify polygonal region of interest (ROI) |
| [poly2mask](http://www.mathworks.in/help/images/ref/poly2mask.html) | Convert region of interest (ROI) polygon to region mask |
| [roicolor](http://www.mathworks.in/help/images/ref/roicolor.html) | Select region of interest (ROI) based on color |
| [roifill](http://www.mathworks.in/help/images/ref/roifill.html) | Fill in specified region of interest (ROI) polygon in grayscale image |
| [roifilt2](http://www.mathworks.in/help/images/ref/roifilt2.html) | Filter region of interest (ROI) in image |
| [imellipse](http://www.mathworks.in/help/images/ref/imellipse.html) | Create draggable ellipse |
| [imfreehand](http://www.mathworks.in/help/images/ref/imfreehand.html) | Create draggable freehand region |
| [impoly](http://www.mathworks.in/help/images/ref/impoly.html) | Create draggable, resizable polygon |
| [imrect](http://www.mathworks.in/help/images/ref/imrect.html) | Create draggable rectangle |
| [imroi](http://www.mathworks.in/help/images/ref/imroi.html) | Region-of-interest (ROI) base class |

**Neighborhood and Block Processing**

|  |  |
| --- | --- |
| [ImageAdapter](http://www.mathworks.in/help/images/ref/imageadapterclass.html) | Interface for image I/O |
| [blockproc](http://www.mathworks.in/help/images/ref/blockproc.html) | Distinct block processing for image |
| [bestblk](http://www.mathworks.in/help/images/ref/bestblk.html) | Determine optimal block size for block processing |
| [nlfilter](http://www.mathworks.in/help/images/ref/nlfilter.html) | General sliding-neighborhood operations |
| [col2im](http://www.mathworks.in/help/images/ref/col2im.html) | Rearrange matrix columns into blocks |
| [colfilt](http://www.mathworks.in/help/images/ref/colfilt.html) | Columnwise neighborhood operations |
| [im2col](http://www.mathworks.in/help/images/ref/im2col.html) | Rearrange image blocks into columns |

**2-D Filtering**

|  |  |
| --- | --- |
| [imfilter](http://www.mathworks.in/help/images/ref/imfilter.html) | N-D filtering of multidimensional images |
| [nlfilter](http://www.mathworks.in/help/images/ref/nlfilter.html) | General sliding-neighborhood operations |
| [fspecial](http://www.mathworks.in/help/images/ref/fspecial.html) | Create predefined 2-D filter |
| [medfilt2](http://www.mathworks.in/help/images/ref/medfilt2.html) | 2-D median filtering |
| [ordfilt2](http://www.mathworks.in/help/images/ref/ordfilt2.html) | 2-D order-statistic filtering |
| [normxcorr2](http://www.mathworks.in/help/images/ref/normxcorr2.html) | Normalized 2-D cross-correlation |
| [wiener2](http://www.mathworks.in/help/images/ref/wiener2.html) | 2-D adaptive noise-removal filtering |
| [freqz2](http://www.mathworks.in/help/images/ref/freqz2.html) | 2-D frequency response |
| [fsamp2](http://www.mathworks.in/help/images/ref/fsamp2.html) | 2-D FIR filter using frequency sampling |
| [ftrans2](http://www.mathworks.in/help/images/ref/ftrans2.html) | 2-D FIR filter using frequency transformation |
| [fwind1](http://www.mathworks.in/help/images/ref/fwind1.html) | 2-D FIR filter using 1-D window method |
| [fwind2](http://www.mathworks.in/help/images/ref/fwind2.html) | 2-D FIR filter using 2-D window method |
| [convmtx2](http://www.mathworks.in/help/images/ref/convmtx2.html) | 2-D convolution matrix |
| [padarray](http://www.mathworks.in/help/images/ref/padarray.html) | Pad array |

**Morphological Filtering**

|  |  |
| --- | --- |
| [bwhitmiss](http://www.mathworks.in/help/images/ref/bwhitmiss.html) | Binary hit-miss operation |
| [bwmorph](http://www.mathworks.in/help/images/ref/bwmorph.html) | Morphological operations on binary images |
| [bwulterode](http://www.mathworks.in/help/images/ref/bwulterode.html) | Ultimate erosion |
| [bwareaopen](http://www.mathworks.in/help/images/ref/bwareaopen.html) | Remove small objects from binary image |
| [imbothat](http://www.mathworks.in/help/images/ref/imbothat.html) | Bottom-hat filtering |
| [imclearborder](http://www.mathworks.in/help/images/ref/imclearborder.html) | Suppress light structures connected to image border |
| [imclose](http://www.mathworks.in/help/images/ref/imclose.html) | Morphologically close image |
| [imdilate](http://www.mathworks.in/help/images/ref/imdilate.html) | Dilate image |
| [imerode](http://www.mathworks.in/help/images/ref/imerode.html) | Erode image |
| [imextendedmax](http://www.mathworks.in/help/images/ref/imextendedmax.html) | Extended-maxima transform |
| [imextendedmin](http://www.mathworks.in/help/images/ref/imextendedmin.html) | Extended-minima transform |
| [imfill](http://www.mathworks.in/help/images/ref/imfill.html) | Fill image regions and holes |
| [imhmax](http://www.mathworks.in/help/images/ref/imhmax.html) | H-maxima transform |
| [imhmin](http://www.mathworks.in/help/images/ref/imhmin.html) | H-minima transform |
| [imimposemin](http://www.mathworks.in/help/images/ref/imimposemin.html) | Impose minima |
| [imopen](http://www.mathworks.in/help/images/ref/imopen.html) | Morphologically open image |
| [imreconstruct](http://www.mathworks.in/help/images/ref/imreconstruct.html) | Morphological reconstruction |
| [imregionalmax](http://www.mathworks.in/help/images/ref/imregionalmax.html) | Regional maxima |
| [imregionalmin](http://www.mathworks.in/help/images/ref/imregionalmin.html) | Regional minima |
| [imtophat](http://www.mathworks.in/help/images/ref/imtophat.html) | Top-hat filtering |
| [watershed](http://www.mathworks.in/help/images/ref/watershed.html) | Watershed transform |
| [conndef](http://www.mathworks.in/help/images/ref/conndef.html) | Create connectivity array |
| [iptcheckconn](http://www.mathworks.in/help/images/ref/iptcheckconn.html) | Check validity of connectivity argument |
| [applylut](http://www.mathworks.in/help/images/ref/applylut.html) | Neighborhood operations on binary images using lookup tables |
| [bwlookup](http://www.mathworks.in/help/images/ref/bwlookup.html) | Nonlinear filtering using lookup tables |
| [makelut](http://www.mathworks.in/help/images/ref/makelut.html) | Create lookup table for use with bwlookup |
| [strel](http://www.mathworks.in/help/images/ref/strel.html) | Create morphological structuring element (STREL) |
| [getheight](http://www.mathworks.in/help/images/ref/getheight.html) | Height of structuring element |
| [getneighbors](http://www.mathworks.in/help/images/ref/getneighbors.html) | Structuring element neighbor locations and heights |
| [getnhood](http://www.mathworks.in/help/images/ref/getnhood.html) | Structuring element neighborhood |
| [getsequence](http://www.mathworks.in/help/images/ref/getsequence.html) | Sequence of decomposed structuring elements |
| [isflat](http://www.mathworks.in/help/images/ref/isflat.html) | True for flat structuring element |
| [reflect](http://www.mathworks.in/help/images/ref/reflect.html) | Reflect structuring element |
| [translate](http://www.mathworks.in/help/images/ref/translate.html) | Translate structuring element (STREL) |

**Deblurring**

|  |  |
| --- | --- |
| [deconvblind](http://www.mathworks.in/help/images/ref/deconvblind.html) | Deblur image using blind deconvolution |
| [deconvlucy](http://www.mathworks.in/help/images/ref/deconvlucy.html) | Deblur image using Lucy-Richardson method |
| [deconvreg](http://www.mathworks.in/help/images/ref/deconvreg.html) | Deblur image using regularized filter |
| [deconvwnr](http://www.mathworks.in/help/images/ref/deconvwnr.html) | Deblur image using Wiener filter |
| [edgetaper](http://www.mathworks.in/help/images/ref/edgetaper.html) | Taper discontinuities along image edges |
| [otf2psf](http://www.mathworks.in/help/images/ref/otf2psf.html) | Convert optical transfer function to point-spread function |
| [psf2otf](http://www.mathworks.in/help/images/ref/psf2otf.html) | Convert point-spread function to optical transfer function |
| [padarray](http://www.mathworks.in/help/images/ref/padarray.html) | Pad array |

**Image Arithmetic**

|  |  |
| --- | --- |
| [imabsdiff](http://www.mathworks.in/help/images/ref/imabsdiff.html) | Absolute difference of two images |
| [imadd](http://www.mathworks.in/help/images/ref/imadd.html) | Add two images or add constant to image |
| [imapplymatrix](http://www.mathworks.in/help/images/ref/imapplymatrix.html) | Linear combination of color channels |
| [imcomplement](http://www.mathworks.in/help/images/ref/imcomplement.html) | Complement image |
| [imdivide](http://www.mathworks.in/help/images/ref/imdivide.html) | Divide one image into another or divide image by constant |
| [imlincomb](http://www.mathworks.in/help/images/ref/imlincomb.html) | Linear combination of images |
| [immultiply](http://www.mathworks.in/help/images/ref/immultiply.html) | Multiply two images or multiply image by constant |
| [imsubtract](http://www.mathworks.in/help/images/ref/imsubtract.html) | Subtract one image from another or subtract constant from image |

**Image Analysis**

**Object Analysis**

|  |  |
| --- | --- |
| [bwboundaries](http://www.mathworks.in/help/images/ref/bwboundaries.html) | Trace region boundaries in binary image |
| [bwtraceboundary](http://www.mathworks.in/help/images/ref/bwtraceboundary.html) | Trace object in binary image |
| [corner](http://www.mathworks.in/help/images/ref/corner.html) | Find corner points in image |
| [cornermetric](http://www.mathworks.in/help/images/ref/cornermetric.html) | Create corner metric matrix from image |
| [edge](http://www.mathworks.in/help/images/ref/edge.html) | Find edges in intensity image |
| [hough](http://www.mathworks.in/help/images/ref/hough.html) | Hough transform |
| [houghlines](http://www.mathworks.in/help/images/ref/houghlines.html) | Extract line segments based on Hough transform |
| [houghpeaks](http://www.mathworks.in/help/images/ref/houghpeaks.html) | Identify peaks in Hough transform |
| [imfindcircles](http://www.mathworks.in/help/images/ref/imfindcircles.html) | Find circles using circular Hough transform |
| [imgradient](http://www.mathworks.in/help/images/ref/imgradient.html) | Gradient magnitude and direction of an image |
| [imgradientxy](http://www.mathworks.in/help/images/ref/imgradientxy.html) | Directional gradients of an image |
| [viscircles](http://www.mathworks.in/help/images/ref/viscircles.html) | Create circle |
| [qtdecomp](http://www.mathworks.in/help/images/ref/qtdecomp.html) | Quadtree decomposition |
| [qtgetblk](http://www.mathworks.in/help/images/ref/qtgetblk.html) | Block values in quadtree decomposition |
| [qtsetblk](http://www.mathworks.in/help/images/ref/qtsetblk.html) | Set block values in quadtree decomposition |

**Region and Image Properties**

|  |  |
| --- | --- |
| [regionprops](http://www.mathworks.in/help/images/ref/regionprops.html) | Measure properties of image regions |
| [bwarea](http://www.mathworks.in/help/images/ref/bwarea.html) | Area of objects in binary image |
| [bwconncomp](http://www.mathworks.in/help/images/ref/bwconncomp.html) | Find connected components in binary image |
| [bwconvhull](http://www.mathworks.in/help/images/ref/bwconvhull.html) | Generate convex hull image from binary image |
| [bwdist](http://www.mathworks.in/help/images/ref/bwdist.html) | Distance transform of binary image |
| [bwdistgeodesic](http://www.mathworks.in/help/images/ref/bwdistgeodesic.html) | Geodesic distance transform of binary image |
| [bweuler](http://www.mathworks.in/help/images/ref/bweuler.html) | Euler number of binary image |
| [bwperim](http://www.mathworks.in/help/images/ref/bwperim.html) | Find perimeter of objects in binary image |
| [bwselect](http://www.mathworks.in/help/images/ref/bwselect.html) | Select objects in binary image |
| [graydist](http://www.mathworks.in/help/images/ref/graydist.html) | Gray-weighted distance transform of grayscale image |
| [imcontour](http://www.mathworks.in/help/images/ref/imcontour.html) | Create contour plot of image data |
| [imhist](http://www.mathworks.in/help/images/ref/imhist.html) | Histogram of image data |
| [impixel](http://www.mathworks.in/help/images/ref/impixel.html) | Pixel color values |
| [improfile](http://www.mathworks.in/help/images/ref/improfile.html) | Pixel-value cross-sections along line segments |
| [corr2](http://www.mathworks.in/help/images/ref/corr2.html) | 2-D correlation coefficient |
| [mean2](http://www.mathworks.in/help/images/ref/mean2.html) | Average or mean of matrix elements |
| [std2](http://www.mathworks.in/help/images/ref/std2.html) | Standard deviation of matrix elements |
| [bwlabel](http://www.mathworks.in/help/images/ref/bwlabel.html) | Label connected components in 2-D binary image |
| [bwlabeln](http://www.mathworks.in/help/images/ref/bwlabeln.html) | Label connected components in binary image |
| [labelmatrix](http://www.mathworks.in/help/images/ref/labelmatrix.html) | Create label matrix from bwconncomp structure |
| [bwpack](http://www.mathworks.in/help/images/ref/bwpack.html) | Pack binary image |
| [bwunpack](http://www.mathworks.in/help/images/ref/bwunpack.html) | Unpack binary image |

**Texture Analysis**

|  |  |
| --- | --- |
| [entropy](http://www.mathworks.in/help/images/ref/entropy.html) | Entropy of grayscale image |
| [entropyfilt](http://www.mathworks.in/help/images/ref/entropyfilt.html) | Local entropy of grayscale image |
| [rangefilt](http://www.mathworks.in/help/images/ref/rangefilt.html) | Local range of image |
| [stdfilt](http://www.mathworks.in/help/images/ref/stdfilt.html) | Local standard deviation of image |
| [graycomatrix](http://www.mathworks.in/help/images/ref/graycomatrix.html) | Create gray-level co-occurrence matrix from image |
| [graycoprops](http://www.mathworks.in/help/images/ref/graycoprops.html) | Properties of gray-level co-occurrence matrix |

**Segmentation**

|  |  |
| --- | --- |
| [activecontour](http://www.mathworks.in/help/images/ref/activecontour.html) | Segment image into foreground and background using active contour |
| [graythresh](http://www.mathworks.in/help/images/ref/graythresh.html) | Global image threshold using Otsu's method |
| [multithresh](http://www.mathworks.in/help/images/ref/multithresh.html) | Multilevel image thresholds using Otsu method |

**Image Transforms**

|  |  |
| --- | --- |
| [bwdist](http://www.mathworks.in/help/images/ref/bwdist.html) | Distance transform of binary image |
| [bwdistgeodesic](http://www.mathworks.in/help/images/ref/bwdistgeodesic.html) | Geodesic distance transform of binary image |
| [graydist](http://www.mathworks.in/help/images/ref/graydist.html) | Gray-weighted distance transform of grayscale image |
| [hough](http://www.mathworks.in/help/images/ref/hough.html) | Hough transform |
| [dct2](http://www.mathworks.in/help/images/ref/dct2.html) | 2-D discrete cosine transform |
| [dctmtx](http://www.mathworks.in/help/images/ref/dctmtx.html) | Discrete cosine transform matrix |
| [fan2para](http://www.mathworks.in/help/images/ref/fan2para.html) | Convert fan-beam projections to parallel-beam |
| [fanbeam](http://www.mathworks.in/help/images/ref/fanbeam.html) | Fan-beam transform |
| [idct2](http://www.mathworks.in/help/images/ref/idct2.html) | 2-D inverse discrete cosine transform |
| [ifanbeam](http://www.mathworks.in/help/images/ref/ifanbeam.html) | Inverse fan-beam transform |
| [iradon](http://www.mathworks.in/help/images/ref/iradon.html) | Inverse Radon transform |
| [para2fan](http://www.mathworks.in/help/images/ref/para2fan.html) | Convert parallel-beam projections to fan-beam |
| [radon](http://www.mathworks.in/help/images/ref/radon.html) | Radon transform |
| [fft2](http://www.mathworks.in/help/matlab/ref/fft2.html) | 2-D fast Fourier transform |
| [fftshift](http://www.mathworks.in/help/matlab/ref/fftshift.html) | Shift zero-frequency component to center of spectrum |
| [ifft2](http://www.mathworks.in/help/matlab/ref/ifft2.html) | 2-D inverse fast Fourier transform |
| [ifftshift](http://www.mathworks.in/help/matlab/ref/ifftshift.html) | Inverse FFT shift |

**Color**

|  |  |
| --- | --- |
| [makecform](http://www.mathworks.in/help/images/ref/makecform.html) | Create color transformation structure |
| [applycform](http://www.mathworks.in/help/images/ref/applycform.html) | Apply device-independent color space transformation |
| [iccfind](http://www.mathworks.in/help/images/ref/iccfind.html) | Search for ICC profiles |
| [iccread](http://www.mathworks.in/help/images/ref/iccread.html) | Read ICC profile |
| [iccroot](http://www.mathworks.in/help/images/ref/iccroot.html) | Find system default ICC profile repository |
| [iccwrite](http://www.mathworks.in/help/images/ref/iccwrite.html) | Write ICC color profile to disk file |
| [isicc](http://www.mathworks.in/help/images/ref/isicc.html) | True for valid ICC color profile |
| [imapprox](http://www.mathworks.in/help/matlab/ref/imapprox.html) | Approximate indexed image by reducing number of colors |
| [lab2double](http://www.mathworks.in/help/images/ref/lab2double.html) | Convert L\*a\*b\* data to double |
| [lab2uint16](http://www.mathworks.in/help/images/ref/lab2uint16.html) | Convert L\*a\*b\* data to uint16 |
| [lab2uint8](http://www.mathworks.in/help/images/ref/lab2uint8.html) | Convert L\*a\*b\* data to uint8 |
| [ntsc2rgb](http://www.mathworks.in/help/images/ref/ntsc2rgb.html) | Convert NTSC values to RGB color space |
| [rgb2ntsc](http://www.mathworks.in/help/images/ref/rgb2ntsc.html) | Convert RGB color values to NTSC color space |
| [rgb2ycbcr](http://www.mathworks.in/help/images/ref/rgb2ycbcr.html) | Convert RGB color values to YCbCr color space |
| [xyz2double](http://www.mathworks.in/help/images/ref/xyz2double.html) | Convert XYZ color values to double |
| [xyz2uint16](http://www.mathworks.in/help/images/ref/xyz2uint16.html) | Convert XYZ color values to uint16 |
| [ycbcr2rgb](http://www.mathworks.in/help/images/ref/ycbcr2rgb.html) | Convert YCbCr color values to RGB color space |
| [whitepoint](http://www.mathworks.in/help/images/ref/whitepoint.html) | XYZ color values of standard illuminants |

**Code Generation**

|  |  |
| --- | --- |
| [bwlookup](http://www.mathworks.in/help/images/ref/bwlookup.html) | Nonlinear filtering using lookup tables |
| [bwmorph](http://www.mathworks.in/help/images/ref/bwmorph.html) | Morphological operations on binary images |
| [conndef](http://www.mathworks.in/help/images/ref/conndef.html) | Create connectivity array |
| [fspecial](http://www.mathworks.in/help/images/ref/fspecial.html) | Create predefined 2-D filter |
| [imcomplement](http://www.mathworks.in/help/images/ref/imcomplement.html) | Complement image |
| [imfill](http://www.mathworks.in/help/images/ref/imfill.html) | Fill image regions and holes |
| [imhmax](http://www.mathworks.in/help/images/ref/imhmax.html) | H-maxima transform |
| [imhmin](http://www.mathworks.in/help/images/ref/imhmin.html) | H-minima transform |
| [imreconstruct](http://www.mathworks.in/help/images/ref/imreconstruct.html) | Morphological reconstruction |
| [imregionalmax](http://www.mathworks.in/help/images/ref/imregionalmax.html) | Regional maxima |
| [imregionalmin](http://www.mathworks.in/help/images/ref/imregionalmin.html) | Regional minima |
| [iptcheckconn](http://www.mathworks.in/help/images/ref/iptcheckconn.html) | Check validity of connectivity argument |
| [label2rgb](http://www.mathworks.in/help/images/ref/label2rgb.html) | Convert label matrix into RGB image |
| [padarray](http://www.mathworks.in/help/images/ref/padarray.html) | Pad array |

**GPU Computing**

|  |  |
| --- | --- |
| [bwlookup](http://www.mathworks.in/help/images/ref/bwlookup.html) | Nonlinear filtering using lookup tables |
| [corr2](http://www.mathworks.in/help/images/ref/corr2.html) | 2-D correlation coefficient |
| [edge](http://www.mathworks.in/help/images/ref/edge.html) | Find edges in intensity image |
| [histeq](http://www.mathworks.in/help/images/ref/histeq.html) | Enhance contrast using histogram equalization |
| [imadjust](http://www.mathworks.in/help/images/ref/imadjust.html) | Adjust image intensity values or colormap |
| [imfilter](http://www.mathworks.in/help/images/ref/imfilter.html) | N-D filtering of multidimensional images |
| [imgradient](http://www.mathworks.in/help/images/ref/imgradient.html) | Gradient magnitude and direction of an image |
| [imgradientxy](http://www.mathworks.in/help/images/ref/imgradientxy.html) | Directional gradients of an image |
| [imhist](http://www.mathworks.in/help/images/ref/imhist.html) | Histogram of image data |
| [imnoise](http://www.mathworks.in/help/images/ref/imnoise.html) | Add noise to image |
| [imresize](http://www.mathworks.in/help/images/ref/imresize.html) | Resize image |
| [imrotate](http://www.mathworks.in/help/images/ref/imrotate.html) | Rotate image |
| [imshow](http://www.mathworks.in/help/images/ref/imshow.html) | Display image |
| [medfilt2](http://www.mathworks.in/help/images/ref/medfilt2.html) | 2-D median filtering |
| [padarray](http://www.mathworks.in/help/images/ref/padarray.html) | Pad array |
| [std2](http://www.mathworks.in/help/images/ref/std2.html) | Standard deviation of matrix elements |
| [stdfilt](http://www.mathworks.in/help/images/ref/stdfilt.html) | Local standard deviation of image |
| [im2double](http://www.mathworks.in/help/images/ref/im2double.html) | Convert image to double precision |
| [im2single](http://www.mathworks.in/help/images/ref/im2single.html) | Convert image to single precision |
| [im2uint8](http://www.mathworks.in/help/images/ref/im2uint8.html) | Convert image to 8-bit unsigned integers |
| [im2uint16](http://www.mathworks.in/help/images/ref/im2uint16.html) | Convert image to 16-bit unsigned integers |
| [imabsdiff](http://www.mathworks.in/help/images/ref/imabsdiff.html) | Absolute difference of two images |
| [imlincomb](http://www.mathworks.in/help/images/ref/imlincomb.html) | Linear combination of images |
| [bwmorph](http://www.mathworks.in/help/images/ref/bwmorph.html) | Morphological operations on binary images |
| [imbothat](http://www.mathworks.in/help/images/ref/imbothat.html) | Bottom-hat filtering |
| [imclose](http://www.mathworks.in/help/images/ref/imclose.html) | Morphologically close image |
| [imdilate](http://www.mathworks.in/help/images/ref/imdilate.html) | Dilate image |
| [imerode](http://www.mathworks.in/help/images/ref/imerode.html) | Erode image |
| [imopen](http://www.mathworks.in/help/images/ref/imopen.html) | Morphologically open image |
| [imtophat](http://www.mathworks.in/help/images/ref/imtophat.html) | Top-hat filtering |
| [mat2gray](http://www.mathworks.in/help/images/ref/mat2gray.html) | Convert matrix to grayscale image |
| [rgb2gray](http://www.mathworks.in/help/images/ref/rgb2gray.html) | Convert RGB image or colormap to grayscale |
| [rgb2ycbcr](http://www.mathworks.in/help/images/ref/rgb2ycbcr.html) | Convert RGB color values to YCbCr color space |
| [ycbcr2rgb](http://www.mathworks.in/help/images/ref/ycbcr2rgb.html) | Convert YCbCr color values to RGB color space |