# Geometric Transformations

Resize, rotate, and crop images; perform geometric transformation of multidimensional arrays

## Functions

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| [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 |

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| [checkerboard](http://www.mathworks.in/help/images/ref/checkerboard.html) | Create checkerboard image |

## Classes

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| [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 |

## Examples and How To

* [Resize an Image](http://www.mathworks.in/help/images/resizing-an-image.html)
* [Rotate an Image](http://www.mathworks.in/help/images/rotating-an-image.html)
* [Crop an Image](http://www.mathworks.in/help/images/cropping-an-image.html)
* [Crop an Image Using the Image Viewer App](http://www.mathworks.in/help/images/cropping-an-image-using-the-crop-image-tool.html)
* [Perform a 2-D Translation](http://www.mathworks.in/help/images/perform-a-2-d-translation-transformation.html)
* [Register an Image Using Spatial Referencing Objects to Enhance the Display](http://www.mathworks.in/help/images/example-performing-image-registration.html)

## Concepts

* [2-D Geometric Transformations](http://www.mathworks.in/help/images/performing-general-2-d-spatial-transformations.html)
* [N-Dimensional Spatial Transformations](http://www.mathworks.in/help/images/performing-n-dimensional-spatial-transformations.html)
* [Geometric Transformation Types](http://www.mathworks.in/help/images/geometric-transformation-types.html)