Video and Image Processing Blockset Release Notes

The Chapter 1, “Video and Image Processing Blockset 1.1 Release Notes” describe the changes introduced in the latest version of the Video and Image Processing Blockset. The following topics are discussed in these Release Notes:

The Video and Image Processing Blockset Release Notes also provide information about recent versions of the product, in case you are upgrading from an earlier version.

If you would like to print the Release Notes, you can link to a PDF version.

Contents

1

Video and Image Processing Blockset 1.1 Release Notes

New Features

The Video and Image Processing Blockset Version 1.1 has the following new features.

New Blocks

The Video and Image Processing Blockset contains the following new blocks.

Block Name	Library	Description
Blob Analysis	Statistics	Compute statistical values for labeled regions
Draw Markers	Text & Graphics	Mark locations by drawing circles, x-marks, plus signs, stars, or squares
Draw Shapes	Text & Graphics	Draw rectangles, lines, polygons, or circles on images
Find Local Maxima	Statistics	Find local maxima in matrices
Hough Lines	Transforms	Find Cartesian coordinates of lines that are described by rho and theta pairs
Image Data Type Conversion	Conversions	Convert and scale input image to specified output data type
MPlay	Sinks	View video from the MATLAB workspace, a file, or a Simulink signal
Read Binary File	Sources	Read binary video data from files
Variable Selector	Utilities	Select subset of rows or columns from input
Write Binary File	Sinks	Write binary video data to files

New Demos

The Video and Image Processing Blockset Version 1.1 has the following new demos.

Demo Name	Video and Image Processing Demo Library Location	Launch Command
Bouncing balls	Miscellaneous	`vipbouncingballs`
Lane detection and tracking	Detection and Tracking	`vipdetectlane`
Tracking cars in video	Detection and Tracking	`viptraffic`

Major Bug Fixes

The Video and Image Processing Blockset Version 1.1 includes important bug fixes made since Version 1.0.1. You can see a list of major Version 1.1 bug fixes on the MathWorks Web site.

If you are viewing these release notes in PDF form on the MathWorks Web site, click the words "bug fixes" in the sentence above to see the notes about major fixes.

If you are upgrading from a version earlier than Version 1.0.1, you should also see Major Bug Fixes in the Version 1.0.1 Release Notes.

Upgrading from an Earlier Release

The following topic describes the upgrade issues involved in moving from the Video and Image Processing Blockset Version 1.0.1 to Version 1.1.

Obsolete Blocks

The Draw Shape block is obsolete. It may be removed in a future version of the Video and Image Processing Blockset. Use the replacement block Draw Shapes.

Known Software and Documentation Problems

The MathWorks Web site includes a list of known software and documentation problems in Version 1.1.

If you are viewing these release notes in PDF form on the MathWorks Web site, click the word "problems" in the sentence above to see the notes about known problems.

2

Video and Image Processing Blockset 1.0.1 Release Notes

New Features

The Video and Image Processing Blockset Version 1.0.1 has the following new demos.

Demo Name	Video and Image Processing Demo Library Location	Launch Command
Picture in picture	Miscellaneous	`vippip`
Panorama creation	Miscellaneous	`vippanorama`
Video stabilization (fixed-point version)	Video Enhancement	`vipstabilize_fixpt_win32` (Windows only) `vipstabilize_fixpt_all` (Platform independent)

Major Bug Fixes

The Video and Image Processing Blockset 1.0.1 includes several bug fixes made since Version 1.0. This section describes the important Version 1.0.1 bug fixes.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site and use the link provided.

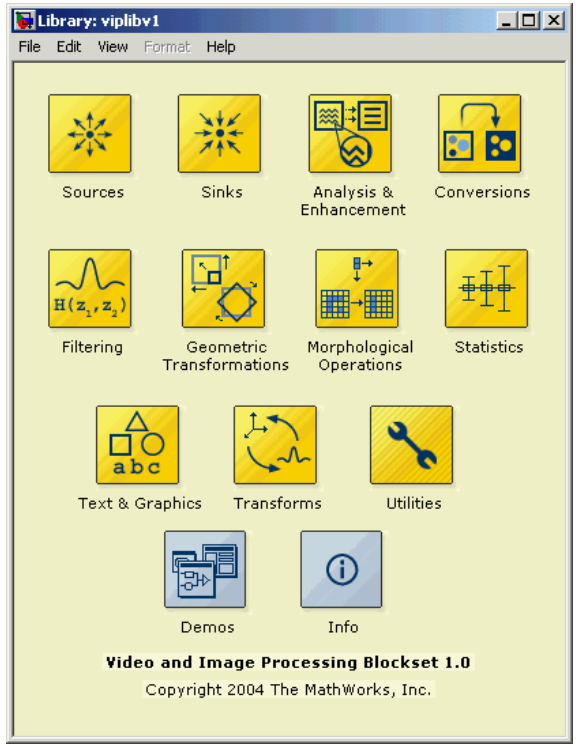
3

Video and Image Processing Blockset 1.0 Release Notes

Introduction to the Video and Image Processing Blockset

The Video and Image Processing Blockset is a tool used for the rapid design, prototyping, graphical simulation, and efficient code generation of video processing algorithms. The Video and Image Processing Blockset blocks can import streaming video into the Simulink environment and perform two-dimensional filtering, geometric and frequency transforms, block processing, motion estimation, edge detection and other signal processing algorithms. You can also use the blockset in conjunction with Real-Time Workshop® to automatically generate embeddable C code for real-time execution.

You can access the main Video and Image Processing Blockset library from the MATLAB® command line by typing `viplib`.



Features

This section introduces the features of the Video and Image Processing Blockset 1.0:

Blocks

The Video and Image Processing Blockset contains 52 blocks that are organized into 11 libraries. This section provides a list of the available blocks, organized by library:

Analysis and Enhancement

This library contains blocks that analyze or enhance your image or video stream.

Edge Detection	Find the edges of objects in an image using the Sobel, Prewitt, or Roberts method
Histogram Equalization	Enhance the contrast of images using histogram equalization
Median Filter	Perform two-dimensional median filtering
SAD	Computes the sum of absolute differences (SAD)

Conversions

This library contains blocks that perform conversion operations such as color space conversion.

Autothreshold	Convert an intensity image to a binary image
Chroma Resampling	Downsample or upsample chrominance components of an image

Color Space Conversion	Convert color information between the R'G'B' and Y'CbCr color spaces, and from the R'G'B' color space to intensity
Gamma Correction	Apply or remove gamma correction from an image or video stream
Image Complement	Compute the complement of the pixel values in a binary, intensity, or RGB image

Filtering

This library contains blocks that filter an image or video stream.

2-D Convolution	Compute two-dimensional convolution of two input matrices
2-D FIR Filter	Perform two-dimensional FIR filtering on an input matrix
Median Filter	Perform two-dimensional median filtering

Geometric Transformations

This library contains blocks that manipulate the size, shape, and orientation of an image or video stream.

Resize	Enlarge or shrink the size of an image
Rotate	Rotate an image by a specified angle
Shear	Shift each row or column of an image by a linearly varying offset
Translate	Translate an image in a two-dimensional plane using a displacement vector

Morphological Operations

This library contains blocks that perform morphological operations such as erosion and dilation.

Bottom-hat	Perform bottom-hat filtering on a intensity or binary image
Closing	Perform morphological closing on a binary or intensity image
Dilation	Find the local maxima in a binary or intensity image
Erosion	Find the local minima in a binary or intensity image
Label	Label connected components in a binary image
Opening	Perform morphological opening on a binary or intensity image
Top-hat	Perform top-hat filtering on a intensity or binary image

Sinks

This library contains blocks that export or display images or video.

Frame Rate Display	Calculate and display the frame rate of a signal
To Multimedia File	Write video frames and optionally audio samples to a multimedia file
To Video Display	Send video data to a video output device, video camera, video monitor, or window on your computer screen
Video To Workspace	Export a video signal to the MATLAB workspace
Video Viewer	Display a binary, intensity, or RGB image or a video stream
Write AVI File	Write video frames to an uncompressed AVI file

Sources

This library contains blocks that import images or video into a Simulink model.

From Multimedia File	Read video frames and optionally audio samples from a compressed multimedia file
Image From File	Import an image from an image file
Image From Workspace	Import an image from the MATLAB workspace
Read AVI File	Read uncompressed video frames from an AVI file
Video From Workspace	Import a video signal from the MATLAB workspace.

Statistics

This library contains blocks that perform statistical operations on an image or video stream.

2-D Autocorrelation	Compute the two-dimensional autocorrelation of the input matrix
2-D Correlation	Compute two-dimensional cross-correlation of two input matrices
2-D Histogram	Generate the histogram of each input matrix
2-D Maximum	Find the maximum value in each input matrix
2-D Mean	Find the mean value of each input matrix
2-D Median	Find the median value of each input matrix
2-D Minimum	Find the minimum value of each input matrix
2-D Standard Deviation	Find the standard deviation of each input matrix
2-D Variance	Compute the variance of each input matrix

Text & Graphics

This library contains blocks that annotate an image or video stream.

Compositing	Combine the pixel values of two images or overlay one image over another
Draw Shape	Draw a rectangle around a region of interest (ROI)
Insert Text	Draw text on an image or video stream

Transforms

This library contains blocks to perform transform operations such as 2-D FFT and 2-D DCT.

2-D DCT	Compute the two-dimensional discrete cosine transform (DCT)
2-D FFT	Compute the two-dimensional FFT of the input
2-D IDCT	Compute the two-dimensional inverse discrete cosine transform (IDCT)
2-D IFFT	Compute the two-dimensional IFFT of the input
Hough Transform	Compute the two-dimensional Hough transform

Utilities

This library contains blocks that perform processing operations such as padding and block processing.

2-D Pad	Pad a matrix along its rows and/or columns
Block Processing	Repeat a user-specified operation on submatrices of the input matrix

Demos

The Video and Image Processing Blockset Version 1.0 contains the following 17 demos.

Demo Name	Video and Image Processing Demo Library Location	Launch Command
Motion detection	Detection and Tracking	`vipmotion`
Surveillance recording	Detection and Tracking	`vipsurveillance`
Pattern matching	Detection and Tracking	`vippattern`
Video compression	Compression	`vipcodec`
Image compression	Compression	`vipimagecompression`
Histogram display	Video Analysis	`viphistogram`
Edge detection	Video Analysis	`vipedge`
Scene change detection	Video Analysis	`vipscenechange`
Video focus assessment	Video Analysis	`vifocus`
Video stabilization	Video Enhancement	`vipstabilize`
Periodic noise reduction	Video Enhancement	`vipstripes`
Histogram equalization	Video Enhancement	`viphisteq`
Rotation correction	Video Enhancement	`viphough`
Feature extraction	Video Segmentation Using Morphology	`vipspokes`
Object counting	Video Segmentation Using Morphology	`vipstaples`
Object extraction and replacement	Video Segmentation Using Morphology	`vipobj`
Continuous image rotation	Geometric Transformation	`viprotate`

Data Type Support

All Video and Image Processing blocks support double-precision and single-precision floating-point data types during simulation and code generation. The following two blocks *only* support double-precision and single-precision floating-point data types on their input and output ports:

- 2-D Standard Deviation
- Autothreshold

Many blocks also support fixed-point data types. To use any data type other than double-precision and single-precision floating point, you must install Simulink® Fixed Point.

Full Support of Embedded Real-Time (ERT) C Code Generation

All Video and Image Processing Blockset blocks support embedded real-time (ERT) ANSI C code generation (requires the Real-Time Workshop Embedded Coder).