



eVision 5.3 benchmark



These execution times are given in milliseconds, for 512 x 512, 8-bit grayscale images (24-bit color images for EasyColor).

Operations on images were timed in the non destructive case (Dst differs from Src) except as otherwise noted.

Execution time highly depends on computer hardware (processor speed, memory size, cache size, ...).

These times are indicative only. Accurate times may easily be measured using EasyAccess.

Processor Type:	AMD	ATHLON (K7)	INTEL PENTIUM III	INTEL PENTIUM III	INTEL CELERON
Clock frequency:		750 MHZ	800 MHZ	550 MHZ	400 MHZ

EasyImage Library	ms	ms	ms	ms
Convert a BW8 image to a BW16 image	3.2	5.3	7	10
Convert a BW16 image to a BW8 image	3.1	4.2	5.7	7.8
Convert a BW8 image to a C24 image	3.3	3.8	3.6	6.8
Convert a C24 image to a BW8 image	5.5	5.7	7.6	11

Gray level images

Arithmetic & Logic

Copy a constant into an image	0.4	0.3	0.7	1.6
Copy an image into an image	0.9	1.6	1.2	3.1
Invert an image	1	1.5	1.2	3.1
Add two images	1.8	2.7	2.4	4.4
Add a constant to every pixel of an image	1	1.6	1.2	3.1
Subtract two images	2	2.8	2.4	4.3
Subtract a constant from an image	1	1.5	1.2	3.1
Subtract an image from a constant image	0.9	2	1.5	3.8
Multiply two images	2.2	2.8	2.9	4.6
Multiply an image by a constant	1.1	2.1	1.7	3.9
Divide an image by an image	18	19	26	36
Divide an image by a constant	2.7	2.5	2.8	4.7
Divide a constant by an image	2.7	2.5	2.8	4.7
Compare two images	2	2.5	2.6	4.2
Compare an image with a constant	1	2.1	1.5	3.7
Add two images with scaling	2.2	2.7	2.8	4.9
Add a constant to an image with scaling	1.1	2.1	1.7	3.9
Subtract two images with scaling	2.2	2.6	2.8	4.7
Subtract a constant from an image with scaling	1.1	2.1	1.7	4
Subtract an image from a constant	1.1	2	1.7	3.9
Multiply an image by an image with scaling	2.2	2.7	2.8	4.7
Multiply a image by a constant with scaling	1.1	2.1	1.7	4
Divide an image by an image with scaling	18	21	30	40
Divide an image by a constant with scaling	2.8	2.5	2.8	4.7
Divide a constant image by an image with scaling	2.6	2.5	2.8	4.7
Bitwise AND, OR, XOR of two images	1.9	2.6	2.4	4.3
Bitwise AND, OR, XOR of an image and a constant	0.9	1.5	1.2	3.1
Minimum, maximum of two images	2	2.6	2.5	4.9
Minimum, maximum of an image and a constant image	1	2	1.5	3.7

Processor Type:
Clock frequency:

AMD ATHLON (K7)	INTEL PENTIUM III	INTEL PENTIUM III	INTEL CELERON
750 MHZ	800 MHZ	550 MHZ	400 MHZ

Arithmetic & Logic - 16-bit grayscale

Copy a constant into an image	1.2	1.3	1.7	3.9
Add two images	8.7	5.6	7.9	11
Subtract two images	7.7	5.1	6.5	9.6
Multiply two images	9.1	5.8	8.2	12
Divide an image by an image	27	20	29	39

Convolutions

Prewitt X filter	1.9	2.6	2.8	4.7
Prewitt X filter (Src = Dst)	1.6	2.1	2.5	4.5
Prewitt Y filter	1.9	2.6	2.8	4.8
Prewitt filter	3	3.1	4.3	7
Sobel X filter	1.9	2.5	2.8	4.7
Sobel Y filter	2	2.6	3	4.8
Sobel Y filter (Src = Dst)	1.8	2.2	2.6	4.6
Sobel XY filter	3	3.7	4.4	7.1
Gradient X filter	1.3	2.2	1.8	4.2
Gradient Y filter	1	2.1	1.6	3.8
Gradient filter	1.5	2.3	2.2	4.3
Laplacian X filter	1.6	2.4	2.4	4.6
Laplacian Y filter	1.2	2.1	2	3.9
Laplacian 4 filter	2.1	2.7	3.1	5
Laplacian 8 filter	2.1	2.7	3.3	5.2
Lowpass 1 filter	2	2.5	2.9	4.8
Lowpass 1 filter (Src = Dst)	1.7	2.1	2.6	4.6
Lowpass 2 filter	1.9	2.6	2.9	4.8
Lowpass 3 filter	1.9	2.5	2.8	4.7
Highpass 1 filter	2.2	2.8	3.1	5
Highpass 2 filter	2	2.6	3.1	4.9
Roberts filter	8.9	5.3	7.1	10
3x3 uniform filter	2	2.6	2.9	4.8
5x5 uniform filter	5.4	5.1	7.1	10
7x7 uniform filter	5.3	5.1	7	10
15x15 uniform filter	5.4	5.2	7.1	10
3x3 gaussian filter	1.9	2.6	2.8	4.7
3x3 gaussian filter (Src = Dst)	1.6	2.1	2.5	4.5
5x5 gaussian filter	3.4	4.9	5.4	9.3
7x7 gaussian filter	4.9	6.7	7.9	14
3x3 general filter	4.3	6.2	11	17
3x3 general filter (symmetric)	11	9.2	13	18
5x5 general filter	35	26	38	52
5x5 general filter (symmetric)	23	20	28	39
7x7 general filter	67	50	73	100
7x7 general filter (symmetric)	41	33	49	67
Local average (7x7)	5.4	5.1	7	10
Local deviation (7x7)	42	58	84	115

Morphology

Gray scale erosion/dilation (1x3)	1	1.6	1.4	3
Gray scale erosion/dilation (3x1)	1.3	2.2	1.8	4.2
Gray scale erosion/dilation (3x3)	1.6	2.3	2.3	4.5
Gray scale erosion/dilation (3x3) (Src = Dst)	1.2	1.7	1.7	3.8
Gray scale erosion/dilation (5x5)	2.8	4.4	4.1	8.7
Gray scale erosion/dilation (5x5) (Src = Dst)	2.4	3.2	3.4	8.2
Gray scale erosion/dilation (7x7)	3.6	5.8	5.8	13

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Clock frequency:	750 MHZ	800 MHZ	550 MHZ	400 MHZ
Gray scale erosion/dilation (7x7) (Src = Dst)	3.6	4.7	5.1	13
Gray scale circular erosion/dilation (3)	1.6	2.3	2.2	4.4
Gray scale circular erosion/dilation (3) (Src = Dst)	1.3	1.7	1.8	3.9
Gray scale circular erosion/dilation (5)	2.8	4.4	4.2	8.7
Gray scale circular erosion/dilation (5) (Src = Dst)	2.5	3.2	3.5	8.3
Gray scale circular erosion/dilation (7)	4	6	5.9	13
Gray scale circular erosion/dilation (7) (Src = Dst)	3.8	4.8	5.2	13
Gray scale open/close (1x3)	1.6	2.6	2.2	5.3
Gray scale open/close (3x1)	2.3	3.9	3.3	7.2
Gray scale open/close (3x3)	2.6	4.2	4	8.5
Gray scale open/close (5x5)	4.5	7.1	7.2	17
Gray scale open/close (7x7)	6.4	9.8	10	26
Gray scale circular open/close (3)	2.7	4.3	4.3	8.6
Gray scale circular open/close (5)	4.7	7.2	7.5	18
Gray scale circular open/close (7)	6.7	10	11	26
Gray scale white top hat/black top hat (1x3)	2.5	4.9	3.7	9.2
Gray scale white top hat/black top hat (3x1)	3.1	6.1	4.7	11
Gray scale white top hat/black top hat (3x3)	3.5	6.6	5.4	12
Gray scale white top hat/black top hat (5x5)	5.5	9.3	8.7	21
Gray scale white top hat/black top hat (7x7)	7.4	12	12	30
Gray scale circular white top hat/black top hat (3)	3.7	6.5	5.6	12
Gray scale circular white top hat/black top hat (5)	5.6	9.4	8.9	21
Gray scale circular white top hat/black top hat (7)	7.6	13	12	30

Statistics

Image statistics	6.7	2.4	3.2	5.8
Compare pixels	2	1.9	2.6	4.5
Count pixels	2.4	2.3	3.2	5.8
Image area	4.7	2.5	3.5	6
Image area (double threshold)	2.4	2.4	3.2	5.8
Image minimum	1.9	2	2.6	4.4
Image maximum	1.9	1.9	2.6	4.4
Image average	2.1	2.3	3.1	5.8
Image variance	2.4	2.1	2.9	4.9
Binary moments (first order)	4.3	2.9	4.2	6.7
Binary moments (second order)	4.2	4.1	5.8	9.1
Weighed moments (first order)	3.8	2.9	4.1	6.6
Weighed moments (second order)	8.7	6.7	9.7	14
Root mean square amplitude of noise	2.7	2.3	3.2	5.7
Signal to noise ratio	4	2.9	4.1	6.7

Geometric transforms

Scale and rotate (0 interpolation bit, 110%, 5°)	5.6	5.1	6.6	9.8
Scale and rotate (4 interpolation bits, 110%, 5°)	38	20	29	40
Scale and rotate (8 interpolation bits, 110%, 5°)	61	31	44	61
Shrink an image	38	28	41	56
Unwarp (full ring, 1000 x 100 pixels)	5.1	3.5	5.4	7

Gray level transforms

Gain/offset correction	1.1	2.1	1.7	4
Apply a LUT on an image	2.5	2.3	2.4	4.2
Normalize an image	5.2	5	5.7	10
Uniformize an image (2 references)	26	17	24	33
Uniformize an image (1 references)	22	14	20	27
Threshold	1	2.1	1.5	3.7

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Clock frequency:	750 MHZ	800 MHZ	550 MHZ	400 MHZ
Automatic threshold	3.5	4.6	4.4	8.7
Histogram	1.8	2.1	2.9	4.8
Equalize histogram	5.2	4.8	5.2	9.1
Others				
Profile (256 elements)	0.01	0.02	0.02	0.03
Measure the focusing of an image	5.2	3.5	5	7.9
Projection on a row	1.1	1.5	1.9	3.6
Projection on a column	2.2	2.4	3.2	5.8
Noise reduction				
Moving average (internal image)	5.1	5.4	6.5	8.4
Moving average (external image)	5.8	6.9	6.9	10
Color images				
Arithmetic & Logic				
Copy a constant into an image	3.7	3.7	3.1	6.1
Copy an image into an image	5.4	5	4.6	7.3
Invert an image	5.3	5.1	4.6	7.4
Add two images	11	8.1	8.6	10
Add a constant to an image	16	7	8.4	12
Subtract two images	11	8	8.5	10
Subtract a constant from an image	16	7.1	8.4	12
Subtract an image from a constant image	16	6.9	8.4	12
Multiply two images	15	8.1	9.2	13
Multiply an image by a constant	16	6.9	8.4	12
Divide an image by an image	150	56	81	109
Divide an image by a constant	16	6.9	8.4	12
Divide a constant by an image	16	6.9	8.5	12
Compare two images	11	7.9	8.7	11
Add two images with scaling	13	8.1	8.8	10
Add a constant to an image with scaling	16	6.9	8.4	12
Subtract two images with scaling	14	8	8.8	12
Subtract a constant from an image with scaling	16	6.9	8.4	12
Subtract an image from a constant	16	6.9	8.4	12
Multiply an image by an image with scaling	13	8	8.9	11
Multiply a image by a constant with scaling	16	7.1	8.4	12
Divide an image by an image with scaling	154	62	89	121
Divide an image by a constant with scaling	16	6.9	8.4	12
Divide a constant image by an image with scaling	16	6.9	8.5	12
Bitwise AND, OR, XOR of two images	9.3	8	8.5	10
Bitwise AND, OR, XOR of an image and a constant	16	7	8.4	12
Minimum, maximum of two images	11	8.1	8.6	10
Minimum, maximum of an image and a constant	16	6.9	8.4	12
Convolutions				
Prewitt X filter	33	35	38	59
Prewitt Y filter	34	35	38	59
Prewitt filter	38	38	44	66
Sobel X filter	34	35	38	60
Sobel Y filter	34	35	39	60
Sobel filter	38	39	44	66

Processor Type:	AMD ATHLON (K7)	INTEL PENTIUM III	INTEL PENTIUM III	INTEL CELERON
Clock frequency:	750 MHZ	800 MHZ	550 MHZ	400 MHZ
Laplacian X filter	33	34	37	58
Laplacian Y filter	32	33	35	57
Laplacian 4 filter	34	36	39	61
Laplacian 8 filter	34	38	40	61
Lowpass 1 filter	34	37	39	60
Lowpass 2 filter	34	36	38	60
Lowpass 3 filter	34	35	39	60
Highpass 1 filter	35	36	40	61
Highpass 2 filter	34	36	39	60
Roberts filter	58	44	53	76
3x3 general filter	44	46	64	95
5x5 general filter	136	107	145	202
7x7 general filter	231	179	251	345
Morphology				
Color erosion (1x3)	31	32	33	52
Color erosion(3x1)	32	33	35	55
Color erosion (3x3)	33	34	36	57
Color erosion (5x5)	35	39	41	70
Color dilation (1x3)	31	32	33	51
Color dilation (3x1)	32	33	35	53
Color dilation (3x3)	32	34	36	56
Color dilation (5x5)	35	38	40	69
Color open (1x3)	32	34	35	58
Color open (3x1)	34	36	38	62
Color open (3x3)	35	38	40	68
Color open (5x5)	40	46	49	94
Color close (1x3)	32	34	35	57
Color close (3x1)	34	36	38	62
Color close (3x3)	35	38	40	69
Color close (5x5)	41	48	49	95
Color white top hat/black top hat (1x3)	39	43	41	69
Color white top hat/black top hat (3x1)	41	46	44	75
Color white top hat/black top hat (3x3)	42	47	46	79
Color white top hat/black top hat (5x5)	47	55	54	105
Statistics				
Image variances and covariances	11	11	17	23
Image averages	3.9	3.9	5.1	7.4
Image compare	8.7	5.5	7.8	9.7
Geometric transforms				
Scale and rotate (0 interpolation bit, 110%, 5°)	48	43	51	73
Scale and rotate (4 interpolation bits, 110%, 5°)	144	89	118	163
Scale and rotate (8 interpolation bits, 110%, 5°)	212	120	166	227
Shrink an image	144	113	155	214
Warp (full ring, 1000 x 100 pixels)	36	29	40	50
Color transforms				
Gain/offset correction	16	7.1	8.4	12
Others				
Profile (256 elements)	0.01	0.01	0.01	0.02
Measure the focusing of an image	14	12	17	24

Processor Type:

Clock frequency:

AMD
ATHLON (K7)
750 MHZ

INTEL
PENTIUM III
800 MHZ

INTEL
PENTIUM III
550 MHZ

INTEL
CELERON
400 MHZ

EasyObject Library

	ms	ms	ms	ms
Build runs (Double threshold - 100 blobs of 280 pixels each - Black)	3.9	3.6	4.1	6.5
Build runs (Single threshold - 100 blobs of 280 pixels each - Black)	2.8	2.6	3.1	5.2
Build runs (Double threshold , 100+100 blobs of 150 pixels each - Neutral-Black)	3.1	2.9	3.4	5.5
Build runs (Double threshold , 100+100 blobs of 150 pixels each + 1 blob - White-Neutral-Black)	3.4	3.2	4	6.3
Build runs then objects (Double threshold - 100 blobs of 280 pixels each - Black)	32	40	43	102
Build runs then objects (Single threshold - 100 blobs of 280 pixels each - Black)	7.7	6.4	9	16
Build runs then objects (Double threshold , 100+100 blobs of 150 pixels each - Neutral-Black)	8.8	7.4	10	19
Build runs then objects (Double threshold, 100+100 blobs of 150 pixels each + 1 blob - White-Neutral-Black)	12	12	15	27
Analyse objects (AREA - 100 blobs of 280 pixels each)	0.4	0.3	0.6	1.9
Analyse objects (GRAVITY CENTER - 100 blobs of 280 pixels each)	0.9	0.7	1.5	4.3
Analyse objects (CENTROID - 100 blobs of 280 pixels each)	1.9	2	2.4	4.7
Analyse objects (ELLIPSE - 100 blobs of 280 pixels each)	6.7	6.8	11	21

EasyMatch Library

	ms	ms	ms	ms
Match (128 x 128 pattern - 1 occurrence)	2.9	3.2	3.9	6
Match (128 x 128 pattern - 2 occurrences)	3.8	4.4	5.5	8.1
Match $\pm 10^\circ$ rotation (128 x 128 pattern - 2 occurrences)	7.9	8.3	11	16
Match $\pm 15\%$ scaling (128 x 128 pattern - 2 occurrences)	8.8	9.7	13	17

EasyMeasure Library

	ms	ms	ms	ms
Find a point along a line (50 pixels)	<0.01	<0.01	<0.01	0.01
Fit line (20 x 25 pixels)	0.05	0.07	0.1	0.1
Fit circle (63 x 20 pixels)	0.2	0.3	0.4	0.5

EasyColor Library

	ms	ms	ms	ms
White balance on a color image	15	7.2	9.7	12
White balance on a Bayer encoded image	2.8	2.4	3.3	5.8
Transform a Bayer encoded image into a color image (interpolation)	9	7.3	9.1	12
Transform a Bayer encoded image into a color image (no interpolation)	5.8	5.8	8	11
Transform a color image into Bayer encoded image	4.1	4.2	5.3	7.7
Transform RGB to ISH (4 bits without interpolation)	24	16	29	39
Transform RGB to ISH (4 bits with interpolation)	127	122	208	284
Transform RGB to ISH (6 bits without interpolation)	25	19	32	42
Transform RGB to ISH (6 bits with interpolation)	87	102	146	198
Get R component from RGB (6 bits with interpolation)	4.1	4.3	5.3	7.6
Get I component from ISH (6 bits with interpolation)	82	100	153	208
Transform a RGB image into a YUV image (mode FULL_RANGE)	22	19	27	37
Transform a RGB image into a YUV image (mode CCIR 601)	26	23	33	45
Transform a YUV image into a RGB image (mode FULL_RANGE)	17	14	19	25
Transform a YUV image into a RGB image (mode CCIR 601)	19	15	22	29
Transform a 4:2:2 image into a 4:4:4 image	9.8	8.2	11	15
Transform a 4:4:4 image into a 4:2:2 image	11	10	15	20

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Clock frequency:

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EasyOCR Library

	ms	ms	ms	ms
Read text (20000 pixels ROI, 11 chars, 62 patterns)	1.4	1.4	2.1	2.8

EasyOCV Library

	ms	ms	ms	ms
Inspect (32 chars of 1000 pixels each)	6.5	6.7	7.9	13
Inspect (32 chars of 1000 pixels each, skew tolerance 5°)	19	15	23	38

EasyMatrixCode Library

	ms	ms	ms	ms
Read symbol (23x23)	15	13	17	24
ReadSymbol (23x23 - scale tolerance 20%)	16	14	18	26
Read symbol (23x23 - skew tolerance 20°)	18	16	21	30
Read symbol (23x23 - scale tolerance 20%, skew tolerance 20°)	19	17	22	32