

This doc contains

1. Image loading, saving, showing
2. Resizing
3. Crop
4. Color space conversion: BGR to Gray, BGR to HSV
5. Blur/Filter(Median, Gaussian)

IplImage is the object for image. You can load an image from file or you can capture from camera. You can do operation on this IplImage object.

Import

```
import com.googlecode.javacv.cpp.opencv_objdetect;
import com.googlecode.javacpp.Loader;
import com.googlecode.javacv.CanvasFrame;

import static com.googlecode.javacv.cpp.opencv_core.*;
import static com.googlecode.javacv.cpp.opencv_objdetect.*;
import static com.googlecode.javacv.cpp.opencv_imgproc.*;
import static com.googlecode.javacv.cpp.opencv_highgui.*;
```

Loading Image from File

```
IplImage img=null;

img=cvLoadImage("hello.jpg")
```

Saving an IplImage object to file

```
cvSaveImage("save.jpg", img)
```

Showing image

```
//first load an image
IplImage img = cvLoadImage("r.jpg");

//now create a canvasframe object to display image,
//note: canvasframe is similar as JFrame

CanvasFrame canvas = new CanvasFrame("My Image");

canvas.setDefaultCloseOperation(CanvasFrame.EXIT_ON_CLOSE);

//now show the image.
canvas.showImage(img);
```

Output:



Color space conversion

Method:

cvCvtColor(src, dest, flag);

Here,

src = the original image

dest = the converted result will be here, pass a blank image

flag = type of conversion, some are

CV_BGR2GRAY

CV_BGR2HSV

Example_1: RGB to Grayscale Conversion

```
//First load an image.
IplImage img = cvLoadImage("r.jpg");

//make blank gray image, gray image has 1 channel
IplImage gray = IplImage.create(img.width(),
img.height(), IPL_DEPTH_8U, 1);

//now convert to gray iamge
cvCvtColor(img, gray, CV_BGR2GRAY);

//now gray hold the gray image of img object.
//You can show it
CanvasFrame canvas = new CanvasFrame("My Image");

canvas.setDefaultCloseOperation(CanvasFrame.EXIT_ON_CLOSE);

canvas.showImage(gray);
```

Output:

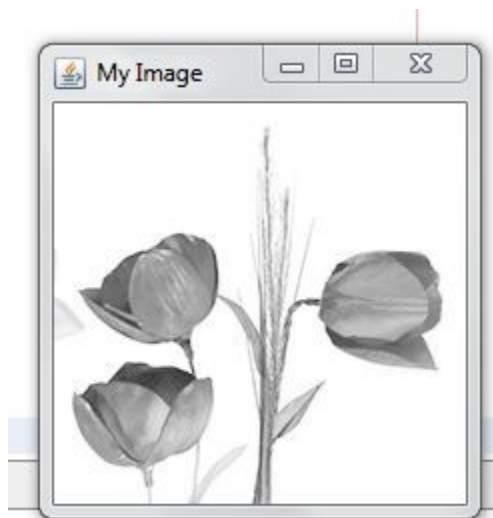


Fig: Grayscale image.

Example_2: **RGB to HSV Conversion**

Similar as converting to Grayscale

```
//First load an image.
IplImage img = cvLoadImage("r.jpg");

//make a blank color image, hsv is color image, so 3
//channel
IplImage hsv = IplImage.create(img.width(),
img.height(), IPL_DEPTH_8U, 3);

//Now convert to HSV image.
cvCvtColor(img, hsv, CV_BGR2HSV);

//now hsv hold the HSV converted image of img object.
//You can show it

CanvasFrame canvas = new CanvasFrame("My Image");

canvas.setDefaultCloseOperation(CanvasFrame.EXIT_ON_CLOSE);

canvas.showImage(hsv);
```

Output:

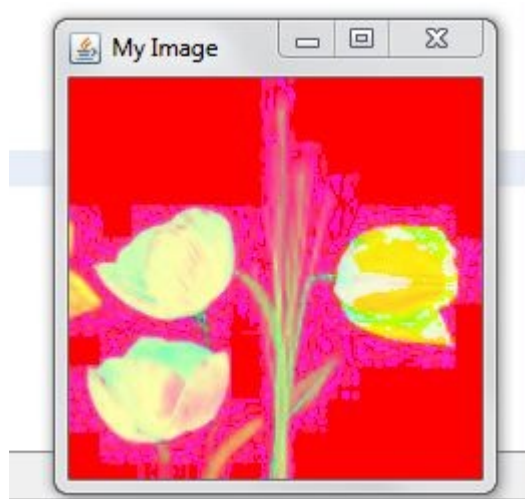


Fig: HSV image.

Image Smoothing / Filtering / Blur

Method:

```
cvSmooth(srcImg, dstImg, CV_MEDIAN, KernelSize);
```

Here,

srcImg =original Image

dstImg =The result will be found here, pass a blank image

flag = type of filtering method, some are

1. CV_MEDIAN
2. CV_GAUSSIAN

KernelSize = give it any odd number greater than 1. You can see the effect by changing this number. By default give it 3

Example_1: Median filter

```
IplImage img = cvLoadImage("r.jpg");

//make blank image of same type as original
IplImage dst = IplImage.create(img.width(),
img.height(), IPL_DEPTH_8U, img.nChannels());

//now do the filtering.
cvSmooth(img, dst, CV_MEDIAN, 5);

//now dst holds the filtered image.
//lets show it.
CanvasFrame canvas = new CanvasFrame("My Image");

canvas.setDefaultCloseOperation(CanvasFrame.EXIT_ON_CLOSE);
canvas.showImage(dst);
```

Output:

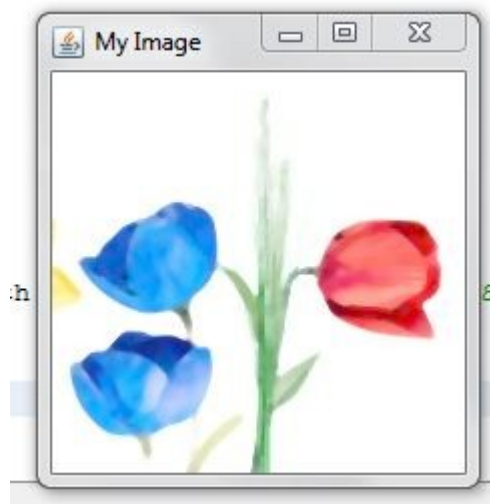


Fig: Median filtered image.

Example_2: Gaussian Filter

```
IplImage img = cvLoadImage("r.jpg");

//make blank image of same type as original
IplImage dst = IplImage.create(img.width(),
img.height(), IPL_DEPTH_8U, img.nChannels());

//now do the filtering.
cvSmooth(img, dst, CV_GAUSSIAN, 5);

//now dst holds the filtered image.
//lets show it.
CanvasFrame canvas = new CanvasFrame("My Image");

canvas.setDefaultCloseOperation(CanvasFrame.EXIT_ON_CLOSE);
canvas.showImage(dst);
```

Output:

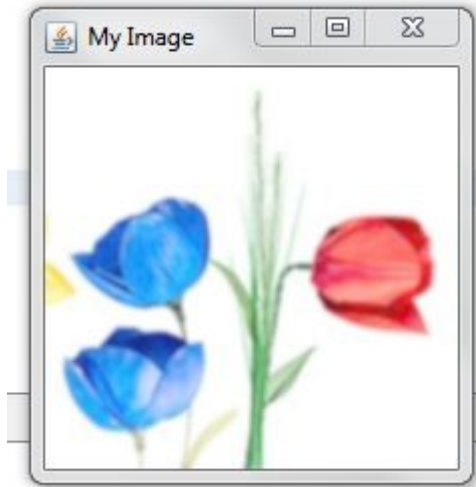


Fig: Gaussian filtered image.

Image Resize

Method:

cvResize(src, dst);

Here,

src = original image

dst = The result will be found here, pass a blank image of desire size.

Example.

```
IplImage src = cvLoadImage("r.jpg");

int newWidth = 100;
int newHeight = 110;

//make a blank image of desire dimension.
IplImage dst = IplImage.create(newWidth, newHeight,
src.depth(), src.nChannels());

//now do the resizing.
cvResize(src, dst);

CanvasFrame canvas = new CanvasFrame("MyImage");

canvas.setDefaultCloseOperation(CanvasFrame.EXIT_ON_CLOSE);
canvas.showImage(dst);
```

Output:



Image Crop

Method:

```
cvSetImageROI(src, r);    //set region of interest  
cvCopy(src, dst);        //Copy original image (only ROI) to dst  
cvResetImageROI(src);    //reset ROI
```

Here,

src = original image

r = rectangle to crop

dst= The result will be found here, pass a blank image .

Example.

```
IplImage src = cvLoadImage("r.jpg");  
  
int upperLeftX = 80;  
int upperLeftY = 40;  
int downRightX = 190;  
int downRightY = 160;  
  
int width = downRightX - upperLeftX;  
int height = downRightY - upperLeftY;  
  
CvRect r = new CvRect(upperLeftX, upperLeftY, width,  
height);  
  
IplImage dst = cvCreateImage(cvGetSize(src),  
src.depth(), src.nChannels());  
  
cvSetImageROI(src, r);        //set region of interest  
cvCopy(src, dst); //Copy original image(only ROI) to dst  
cvResetImageROI(src);        //reset ROI
```

```
CanvasFrame canvas = new CanvasFrame("MyImage");  
  
canvas.setDefaultCloseOperation(CanvasFrame.EXIT_ON_CLOSE);  
canvas.showImage(dst);
```

Output:

