JAVA DIP - APPLYING GAUSSIAN FILTER

In this chapter, we apply Gaussian filter to an image that blurs an image. We are going to use OpenCV function GaussianBlur to apply Gaussian filter to images. It can be found under Imgproc package. Its syntax is given below:

```
Imgproc.GaussianBlur(source, destination,Size,SigmaX);
```

The function arguments are described below:

Sr.No.	Argument
1	**source** It is source image.
2	**destination** It is destination image.
3	**Size** It is Gaussian kernel size.
4	**SigmaX** It is Gaussian kernel standard deviation in X direction.

Apart from the GaussianBlur method, there are other methods provided by the Imgproc class. They are described briefly:

Sr.No.	Methods
1	**cvtColor***Matsrc, Matdst, intcode, intdstCn* It converts an image from one color space to another.
2	**dilate***Matsrc, Matdst, Matkernel* It dilates an image by using a specific structuring element.
3	**equalizeHist***Matsrc, Matdst* It equalizes the histogram of a grayscale image.
4	**filter2D***Matsrc, Matdst, intddepth, Matkernel, Pointanchor, doubledelta*

It convolves an image with the kernel.

5

GaussianBlur*Matsrc, Matdst, Sizeksize, doublesigmaX*

It blurs an image using a Gaussian filter.

6

integral*Matsrc, Matsum*

It calculates the integral of an image.

Example

The following example demonstrates the use of Imgproc class to apply Gaussian filter to an image.

```
import org.opencv.core.Core;
import org.opencv.core.CvType;
import org.opencv.core.Mat;
import org.opencv.core.Size;

import org.opencv.highgui.Highgui;
import org.opencv.imgproc.Imgproc;


public class Main {
   public static void main( String[] args ){

      try {
         System.loadLibrary( Core.NATIVE_LIBRARY_NAME );

         Mat source = Highgui.imread("digital_image_processing.jpg",
         Highgui.CV_LOAD_IMAGE_COLOR);

         Mat destination = new Mat(source.rows(),source.cols(),source.type());
         Imgproc.GaussianBlur(source, destination,new Size(45,45), 0);
         Highgui.imwrite("Gaussian45.jpg", destination);

      } catch (Exception e) {
         System.out.println("Error: " + e.getMessage());
      }
   }
}
```

Output

When you execute the given code, the following output is seen:

Original Image

When this original image is convolved with the Gaussian filter of size 11 and 45, the following output is seen.

Gaussian filter of size 11

Gaussian filter of size 45