Arithmetic Operations on Images

Goal

- Learn several arithmetic operations on images like addition, subtraction, bitwise operations etc.
- You will learn these functions : **cv.add()**, **cv.subtract()** etc.

Image Addition

You can add two images by OpenCV function, **cv.add()**. res = img1 + img2. Both images should be of same depth and type.

For example, consider below sample:

```
let src1 = cv.imread("canvasInput1");
let src2 = cv.imread("canvasInput2");
let dst = new cv.Mat();
let mask = new cv.Mat();
let dtype = -1;
cv.add(src1, src2, dst, mask, dtype);
src1.delete(); src2.delete(); dst.delete(); mask.delete();
```

Image Subtraction

You can subtract two images by OpenCV function, **cv.subtract()**. res = img1 - img2. Both images should be of same depth and type.

For example, consider below sample:

```
let src1 = cv.imread("canvasInput1");
let src2 = cv.imread("canvasInput2");
let dst = new cv.Mat();
let mask = new cv.Mat();
let dtype = -1;
cv.subtract(src1, src2, dst, mask, dtype);
src1.delete(); src2.delete(); dst.delete(); mask.delete();
```

Bitwise Operations

This includes bitwise AND, OR, NOT and XOR operations. They will be highly useful while extracting any part of the image, defining and working with non-rectangular ROI etc. Below we will see an example on how to change a particular region of an image.

I want to put OpenCV logo above an image. If I add two images, it will change color. If I blend it, I get an transparent effect. But I want it to be opaque. If it was a rectangular region, I could use ROI as we did in last chapter. But OpenCV logo is a not a rectangular shape. So you can do it with bitwise operations.

Try it

Image Bitwise Example

<canvas> elements named **imageCanvasInput**, **logoCanvasInput** and **CanvasOutput** have been prepared.

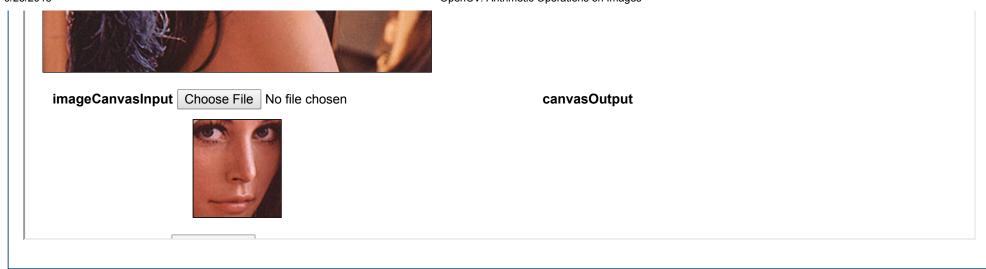Click **Try it** button to see the result. You can choose another image.

You can change the code in the <textarea> to investigate more.

Try it

```
let src = cv.imread('imageCanvasInput');
let logo = cv.imread('logoCanvasInput');
let dst = new cv.Mat();
let roi = new cv.Mat();
let mask = new cv.Mat();
let maskInv = new cv.Mat();
let imgBg = new cv.Mat();
let imgFg = new cv.Mat();
let sum = new cv.Mat();
```

imageCanvasInput Choose File   No file chosen   **canvasOutput**