

Filtrare

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1 Blur

```
[70]: import cv2
import numpy as np
from matplotlib import pyplot as plt

img = cv2.imread('D:/poza.jpg')
img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
blur5 = cv2.blur(img, (5, 5))
blur9 = cv2.blur(img, (9, 9))

fig = plt.figure(figsize=(14, 6))
plt.subplot(131)
plt.imshow(img)
plt.title('Original')
plt.axis('off')
plt.subplot(132)
plt.imshow(blur5)
plt.title('Blur 5 x 5')
plt.xticks([], plt.yticks([])) #in loc de plt.axis('off')
plt.subplot(133)
plt.imshow(blur9)
plt.title('Blur 9 x 9')
plt.axis('off')
plt.show()
```



2 Gaussian

```
[1]: import cv2
import numpy as np
from matplotlib import pyplot as plt

img = cv2.imread('D:/poza.jpg')
img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)

gaus5 = cv2.GaussianBlur(img, (5,5),1.5)
gaus9 = cv2.GaussianBlur(img, (9,9),1.5)

fig = plt.figure(figsize=(14, 6))
plt.subplot(131)
plt.imshow(img)
plt.title('Original')
plt.axis('off')
plt.subplot(132)
plt.imshow(gaus5)
plt.title('Gaussian 5 x 5')
plt.axis('off')
plt.subplot(133)
plt.imshow(gaus9)
plt.title('Gaussian 9 x 9')
plt.axis('off')
plt.show()
```



3 Median

```
[2]: import cv2
import numpy as np
from matplotlib import pyplot as plt

img = cv2.imread('D:/poza.jpg')
img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)

median5 = cv2.medianBlur(img, 5)
median9 = cv2.medianBlur(img, 9)

fig = plt.figure(figsize=(14, 6))
plt.subplot(131)
plt.imshow(img)
plt.title('Original')
plt.axis('off')
plt.subplot(132)
plt.imshow(median5)
plt.title('Median 5 x 5')
plt.axis('off')
plt.subplot(133)
plt.imshow(median9)
plt.title('Median 9 x 9')
plt.xticks([], plt.yticks([]))
plt.show()
```



4 Median pe imagine cu zgomot

```
[74]: import random

def zgomot(im, n):
    h, w, _ = im.shape
    for k in range(n):
        i = random.randint(0, h - 1)
        j = random.randint(0, w - 1)
        if len(im.shape) == 3:
            im[i, j] = (255, 255, 255)
    for k in range(n):
        i = random.randint(0, h - 1)
        j = random.randint(0, w - 1)
        if len(im.shape) == 3:
            im[i, j] = (0, 0, 0)
    return

imZgomot = img.copy()
zgomot(imZgomot, 5000)

medianZ5 = cv2.medianBlur(imZgomot, 5)
medianZ9 = cv2.medianBlur(imZgomot, 9)

fig = plt.figure(figsize=(14, 6))
plt.subplot(131)
plt.imshow(imZgomot)
plt.title('Original')
plt.axis('off')
plt.subplot(132)
plt.imshow(medianZ5)
plt.title('Median 5 x 5')
plt.axis('off')
plt.subplot(133)
plt.imshow(medianZ9)
plt.title('Median 9 x 9')
plt.xticks([], plt.yticks([]))
plt.show()
fig.savefig("D:/yes.jpg")
```



5 Bilateral

```
[78]: import cv2
import numpy as np
from matplotlib import pyplot as plt

img = cv2.imread('D:/costum.jpg')
img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)

bil5 = cv2.bilateralFilter(img, 5, 175, 175)
bil9 = cv2.bilateralFilter(img, 51, 175, 175)

fig = plt.figure(figsize=(14, 6))
plt.subplot(131)
plt.imshow(img)
plt.title('Original')
plt.axis('off')
plt.subplot(132)
plt.imshow(bil5)
plt.title('Bilateral 5')
plt.axis('off')
plt.subplot(133)
plt.imshow(bil9)
plt.title('Bilateral 51')
plt.axis('off')
plt.show()
```



6 Sobel si Laplacian

```
[64]: import cv2
import numpy as np
from matplotlib import pyplot as plt

img = cv2.imread('D:/sms.jpg', 0)

laplacian = cv2.Laplacian(img, cv2.CV_64F)
sobelx = cv2.Sobel(img,cv2.CV_64F, 1, 0, ksize=5)
sobely = cv2.Sobel(img,cv2.CV_64F, 0, 1, ksize=5)

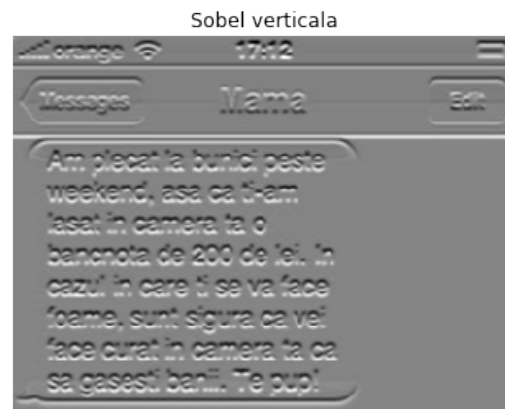
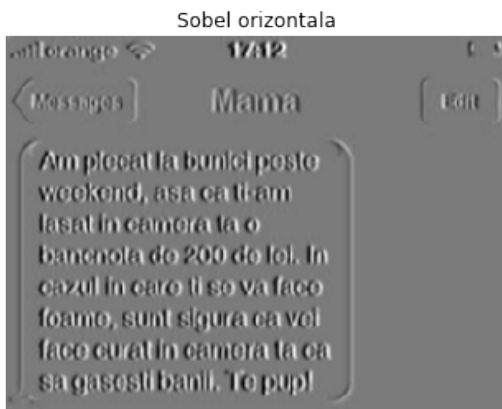
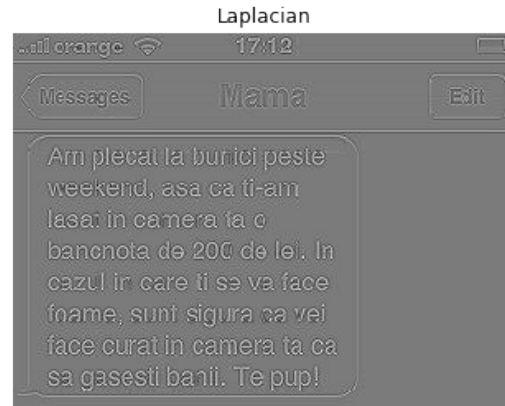
fig = plt.figure(figsize=(12, 10))
plt.subplot(221)
plt.imshow(img,cmap = 'gray')
plt.title('Original')
plt.axis('off')

plt.subplot(222)
plt.imshow(laplacian,cmap = 'gray')
plt.title('Laplacian')
plt.axis('off')

plt.subplot(223)
plt.imshow(sobelx,cmap = 'gray')
plt.title('Sobel orizzontala')
plt.axis('off')

plt.subplot(224)
plt.imshow(sobely,cmap = 'gray')
plt.title('Sobel verticala')
plt.axis('off')

plt.show()
```



[]:

