Análisis estadístico del ruido

In [1]:

```
import cv2
import numpy as np
import matplotlib.pyplot as plt
from glob import glob
%matplotlib inline
```

In [2]:

```
imgs = []
img_fnames = glob('./imgs-ruido/*.jpg')
for fname in img_fnames:
    img = cv2.imread(fname)
    img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
    if img.shape[0] > img.shape[1]:
        img = cv2.transpose(img)
    imgs.append(img)

print("Se cargaron {0} imágenes".format(len(imgs)))
```

```
Se cargaron 10 imágenes
```

In [3]:

```
print("Menor intensidad =", np.min([imgs]))
print("Mayor intensidad =", np.max([imgs]))
```

```
Menor intensidad = 1
Mayor intensidad = 30
```

In [4]:

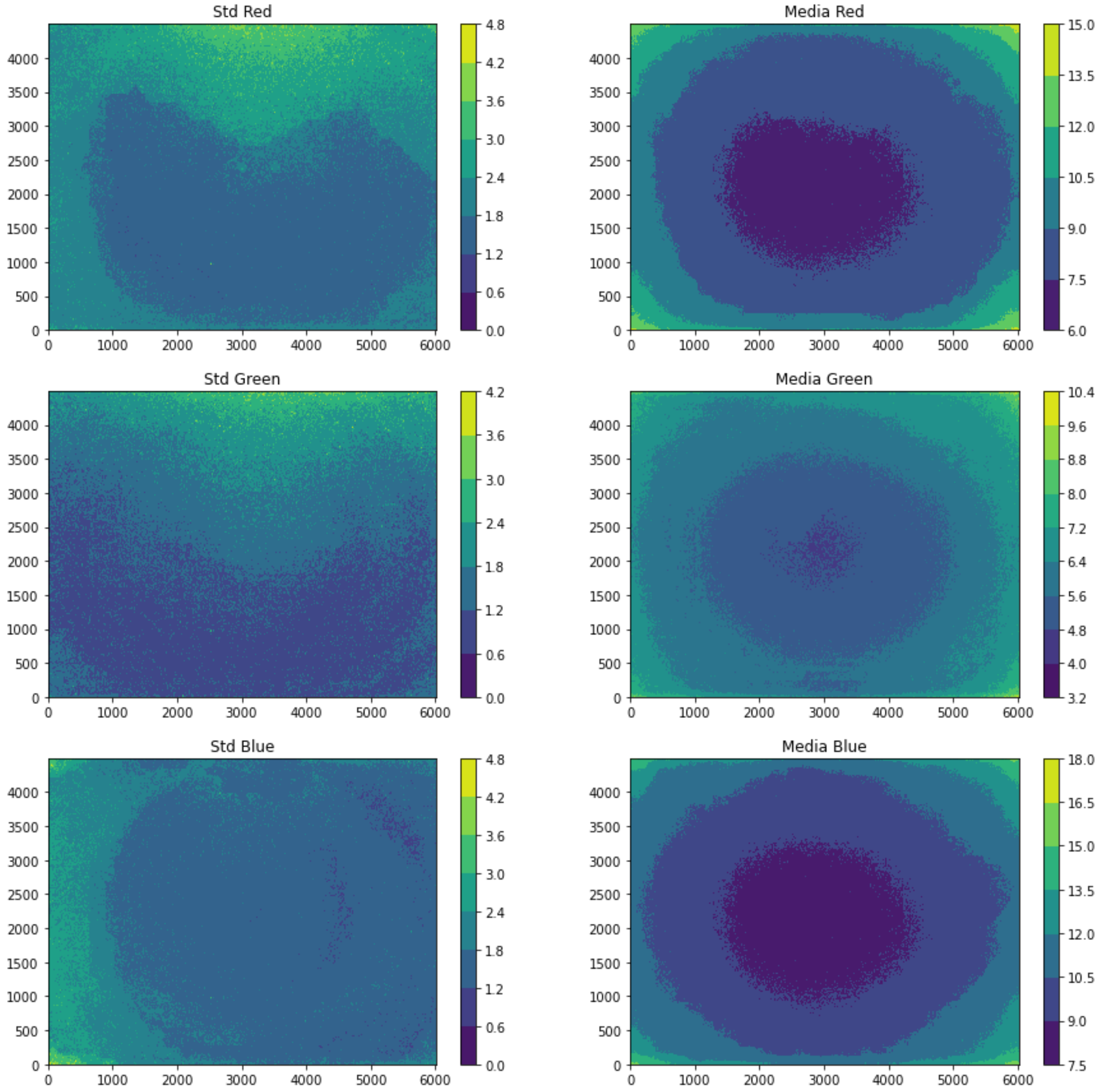
```
## media y desvio std
imgs_np = np.stack(imgs)
img_media = np.mean(imgs_np, axis=0)
img_std = np.std(imgs_np, axis=0)
```

In [5]:

```
def dibujar_contorno(title, axs, mat):
    X, Y = np.meshgrid(range(len(mat[0])), range(len(mat)))
    Z = mat

    # decimación para no matar la compu calculando contornos!
    dec = 16

    cp = axs.contourf(X[::dec], Y[::dec], Z[::dec])
    axs.set_title(title)
    fig.colorbar(cp, ax=axs)
```

In [6]:

```
fig, axs = plt.subplots(3, 2,figsize=(15,15))

for channel, number in [('Red',0), ('Green',1), ('Blue',2)]:
    dibujar_contorno('Std ' + channel,axs[number,0], img_std[:,:,number])
    dibujar_contorno('Media ' + channel, axs[number,1], img_media[:,:,number]

plt.show()
```

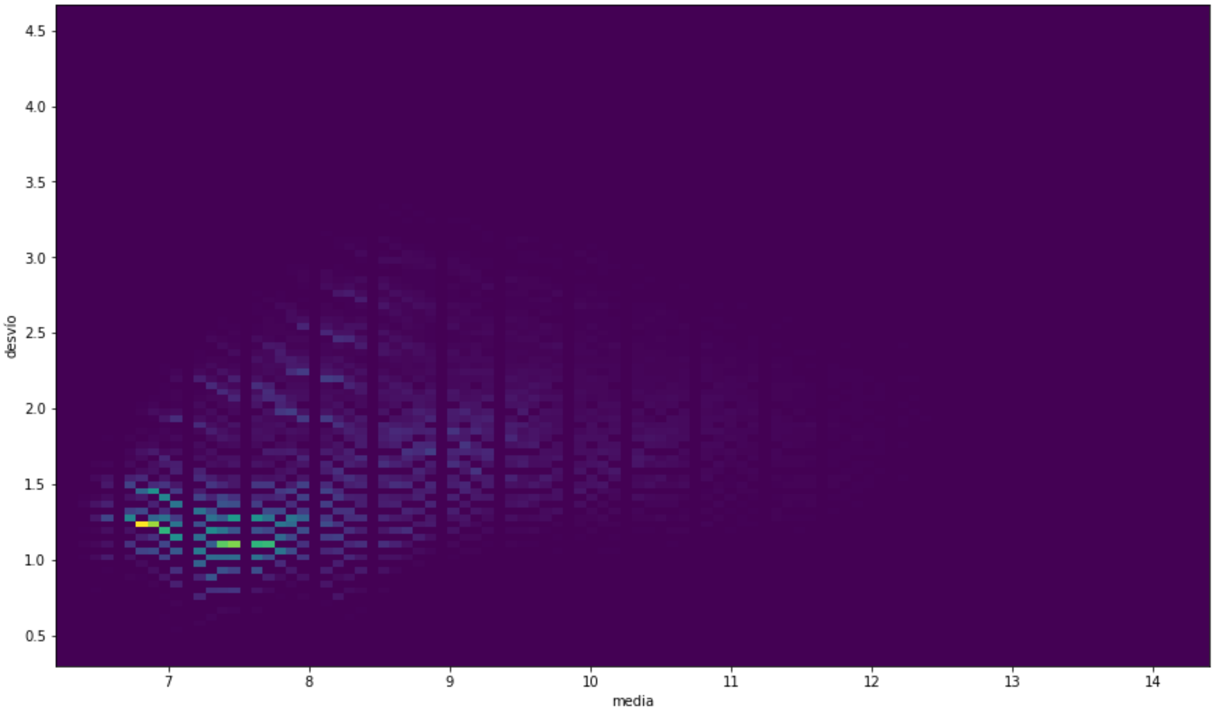


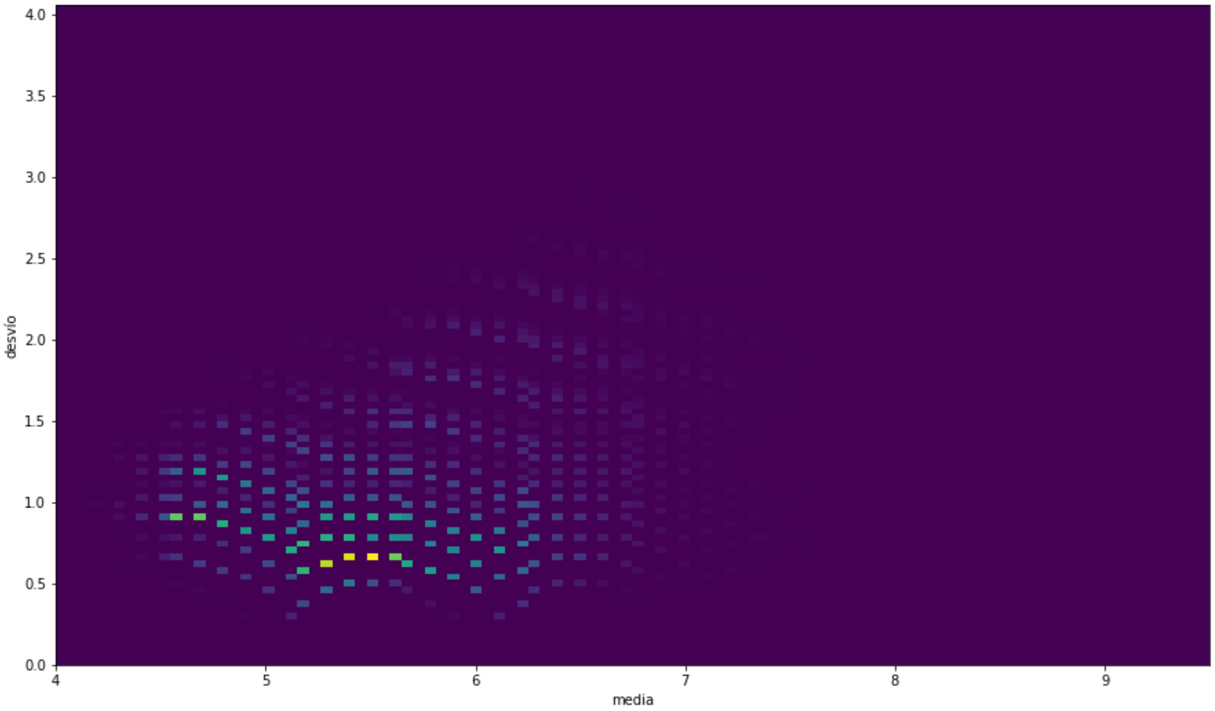
Estadísticas de ruido: relación entre media y desvío

In [7]:

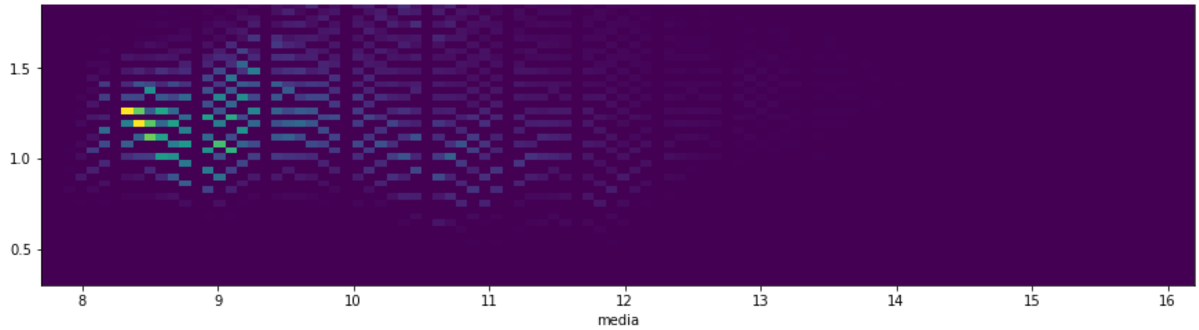
```
fig, axs = plt.subplots(3, 1, figsize=(15,30))

dec = 100

todos_los_rojos_std = np.ravel(img_std[:,:,0])
todos_los_rojos_media = np.ravel(img_media[:,:,0])

todos_los_verdes_std = np.ravel(img_std[:,:,1])
todos_los_verdes_media = np.ravel(img_media[:,:,1])

todos_los_azules_std = np.ravel(img_std[:,:,2])
todos_los_azules_media = np.ravel(img_media[:,:,2])

axs[0].set(xlabel='media' , ylabel='desvío')
cb = axs[0].hist2d(todos_los_rojos_media[::dec], todos_los_rojos_std[::dec],

axs[1].set(xlabel='media' , ylabel='desvío')
cb = axs[1].hist2d(todos_los_verdes_media[::dec], todos_los_verdes_std[::dec]

axs[2].set(xlabel='media' , ylabel='desvío')
```

```
cb = axs[2].hist2d(todos_los_azules_media[::dec], todos_los_azules_std[::dec]

plt.show()
```





desvío
3.5
3.0
2.5
2.0



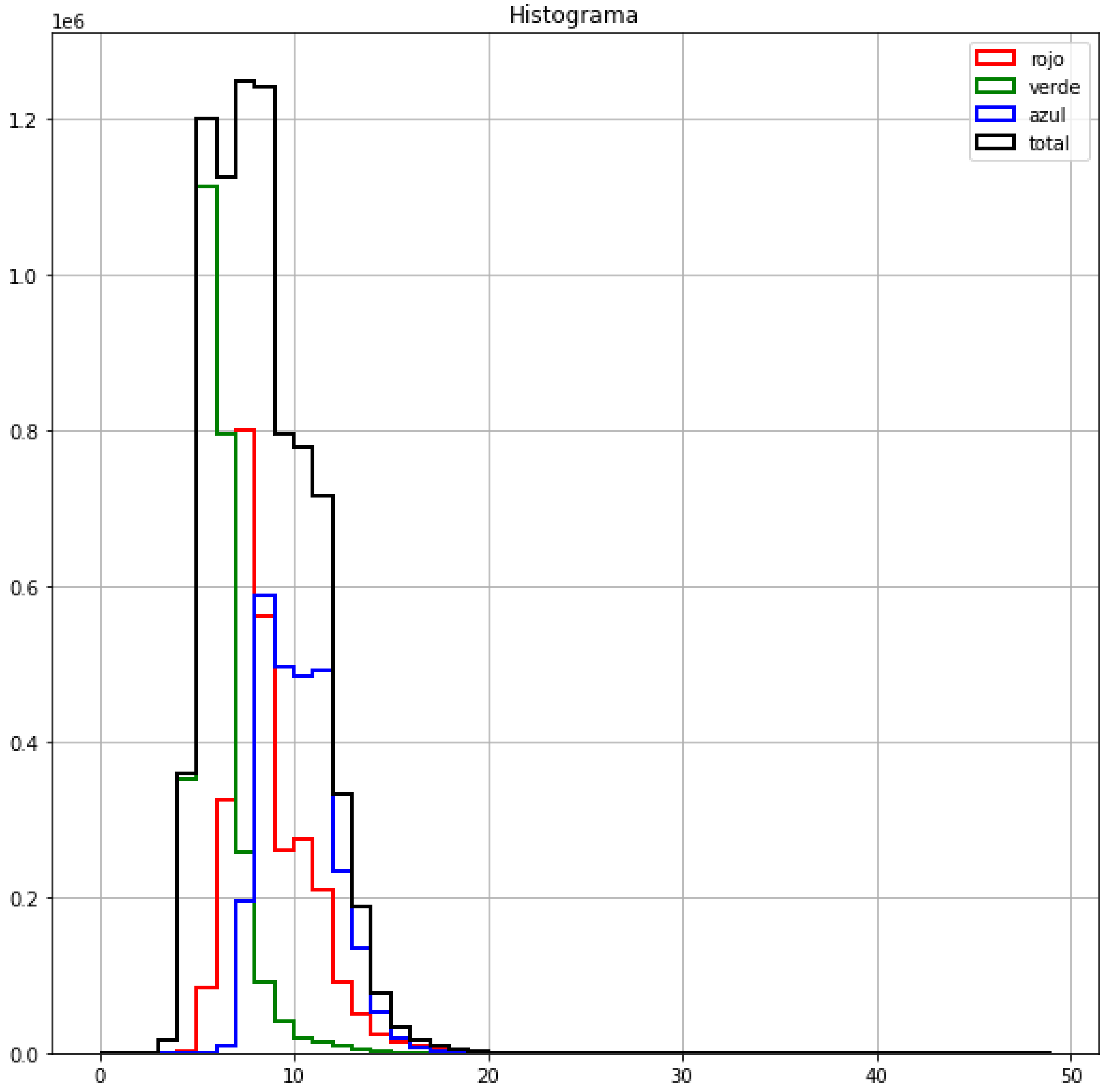
Histograma

In [8]:

```
dec = 100
plt.figure(figsize=(10,10))
plt.title('Histograma')
todos_los_rojos = np.ravel(imgs_np[:,:,:,0])
todos_los_verdes = np.ravel(imgs_np[:,:,:,1])
todos_los_azules = np.ravel(imgs_np[:,:,:,2])
plt.grid()
i_max = 50
_ = plt.hist(todos_los_rojos[::dec], bins=range(i_max), color='red',histtype=
_ = plt.hist(todos_los_verdes[::dec], bins=range(i_max), color='green', histt
_ = plt.hist(todos_los_azules[::dec], bins=range(i_max), color='blue', histty

_ = plt.hist(np.ravel(imgs_np)[::dec], bins=range(i_max), color='black', hist
plt.legend(['rojo', 'verde', 'azul', 'total'])
```

Out[8]:

```
<matplotlib.legend.Legend at 0x7f48f02870d0>
```


Histograma
1e6
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
10
20
30
40
50
rojo
verde
azul
total

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```