Paulina Żak

Transformaty: cosinusowa i falkowa

Obrazy

Kot

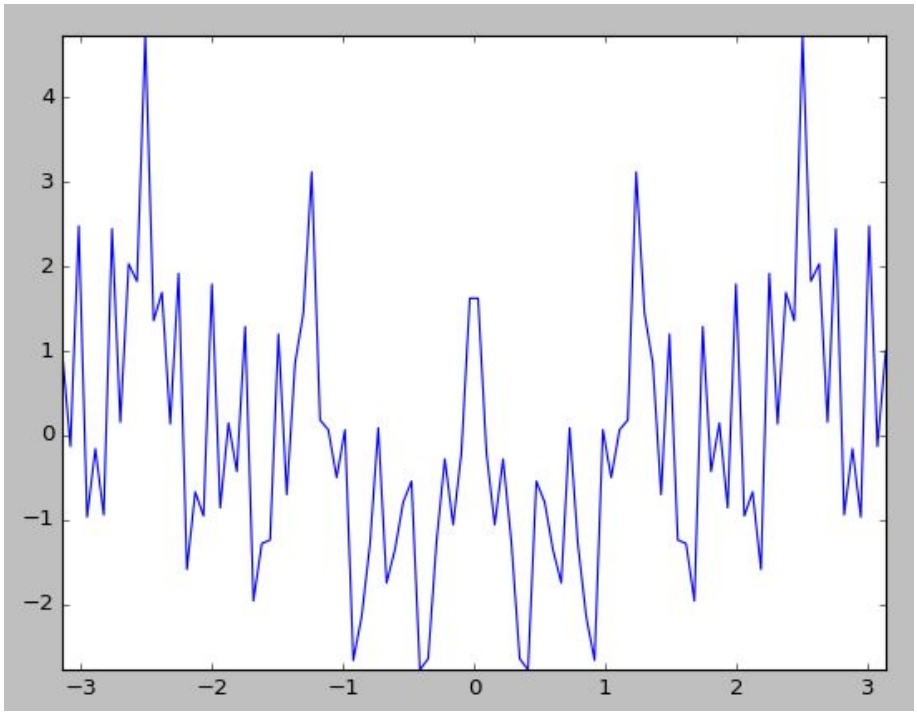
Kot2

Jezioro

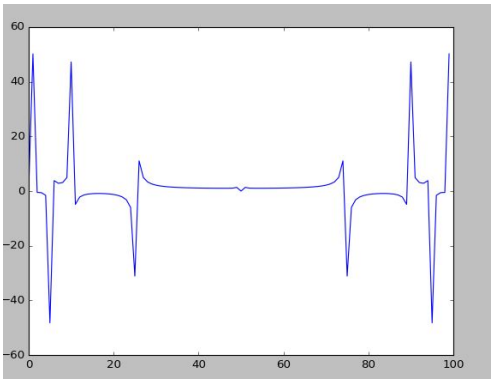
Drzewo

Porównanie FT i WT w 1D

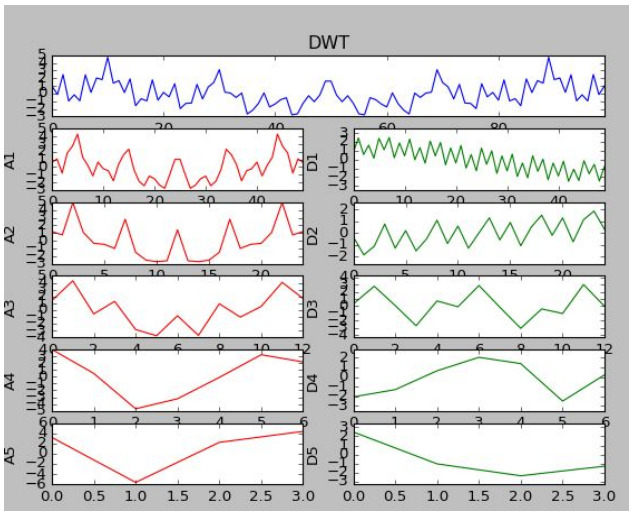
Sygnał będący sumą pięciu sygnałów cosinusowych o różnych częstotliwościach



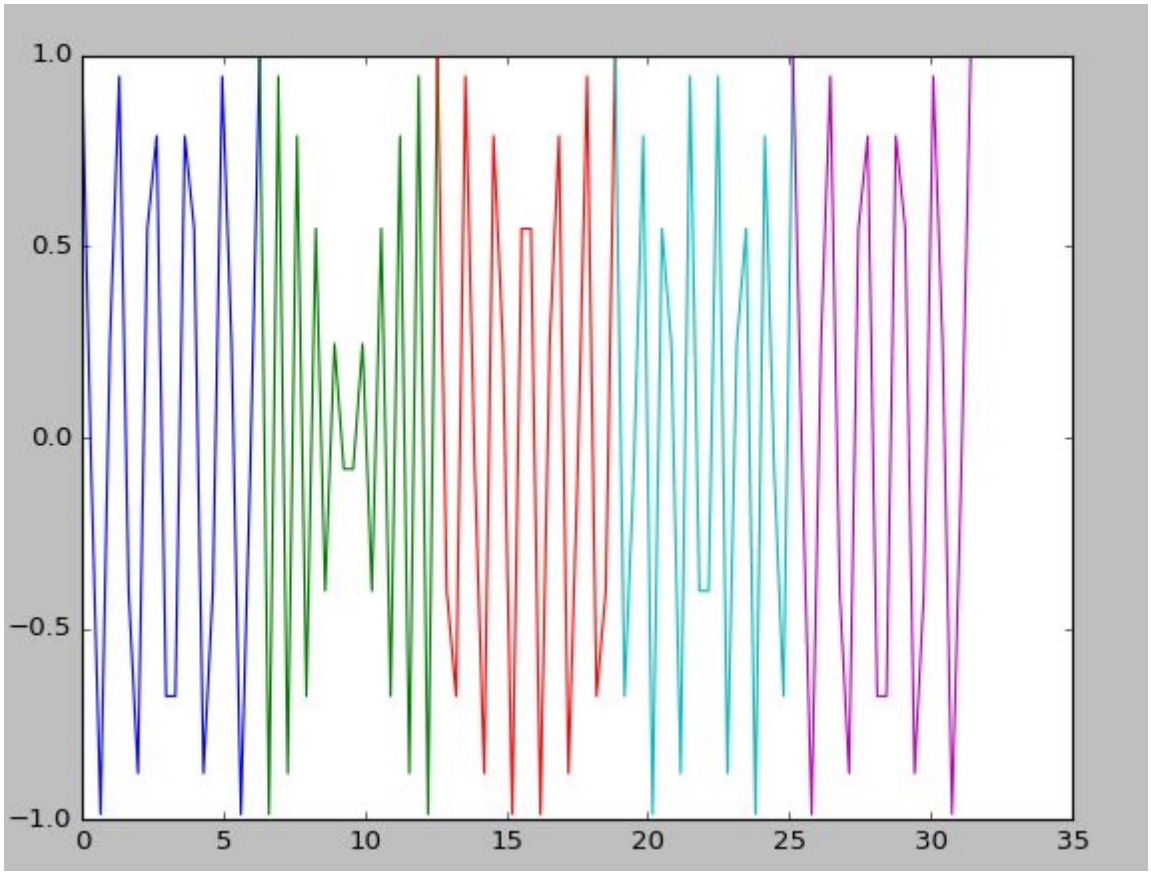
Transformacja FT



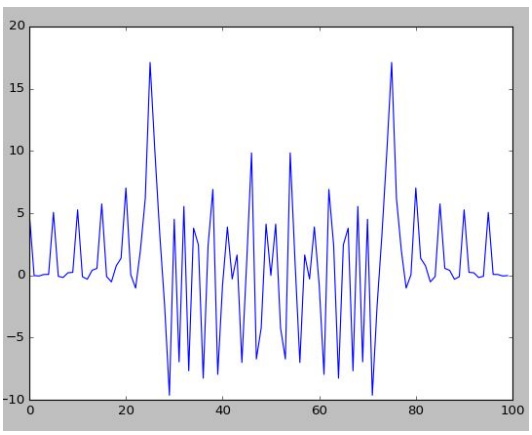
Transformacja WT



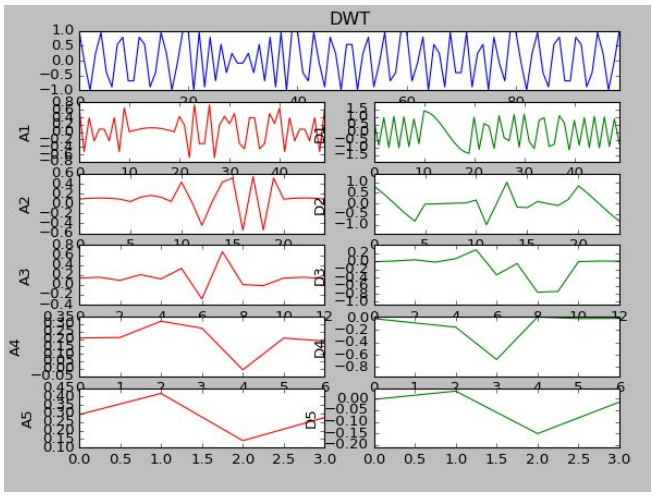
Sygnał złożony z pięciu sygnałów



Transformacja FT



Transformacja WT



5. Kompresja obrazu

Stopień kompresji:

```
ratio = float(uncompressed_size) / float(image_size)
```

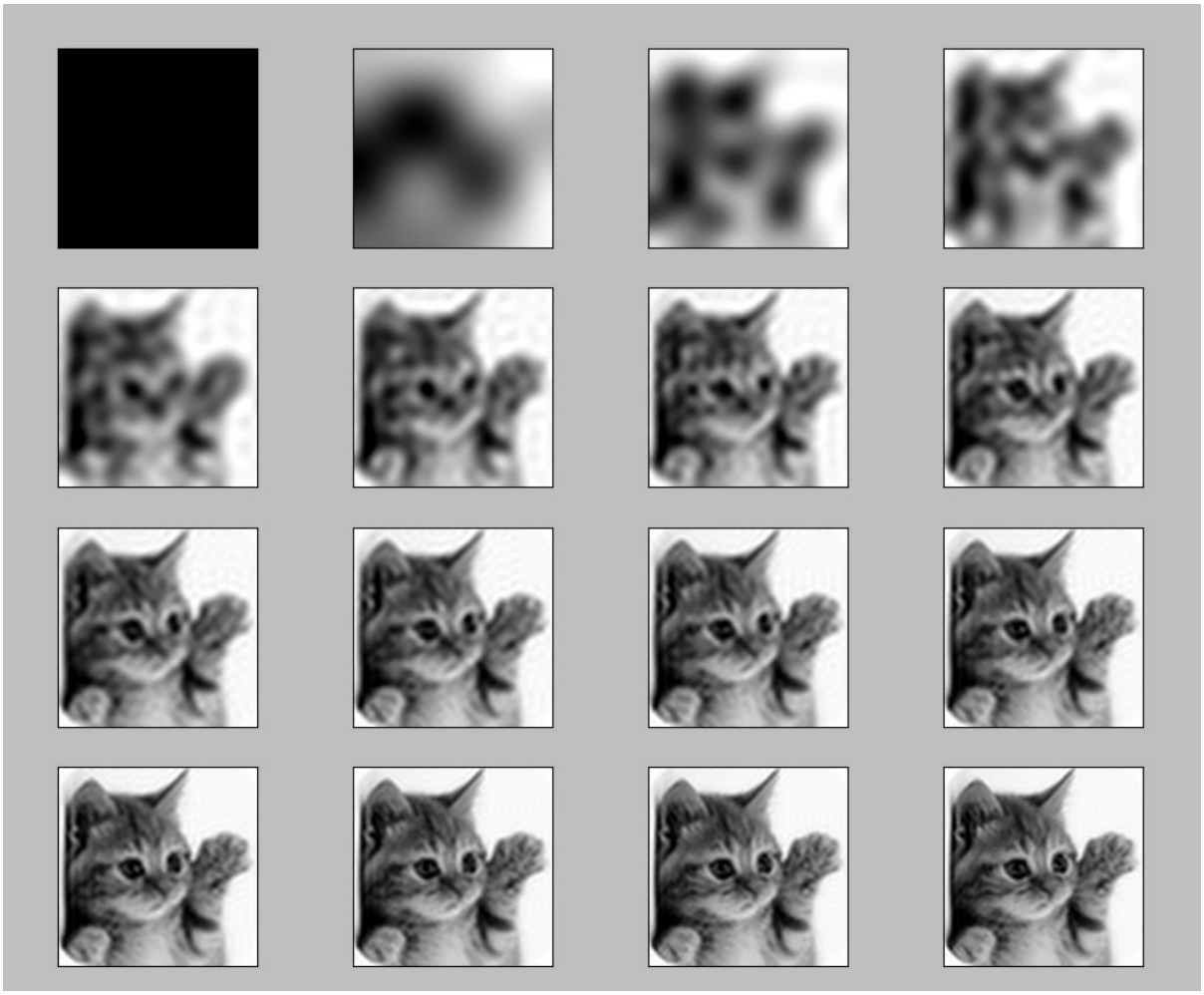
Błąd kompresji

```
err = np.sum((uncompressed - compressed) **  2)
err = err/ float(uncompressed.shape[ 0] * uncompressed.shape[ 1])
```

Transformacja cosinusowa

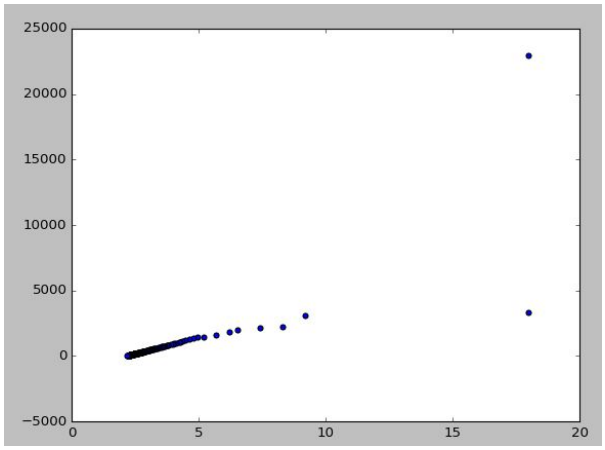
Do pokazania transformacji cosinusowej użyłam co czwartego zrekonstruowanego obrazu

Kot2

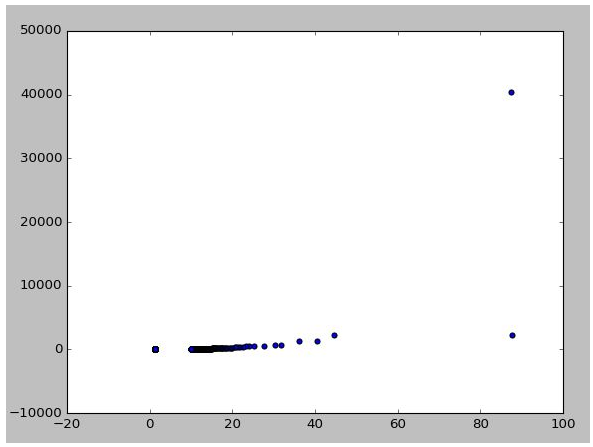


Zależność stopnia kompresji od błędu kompresji

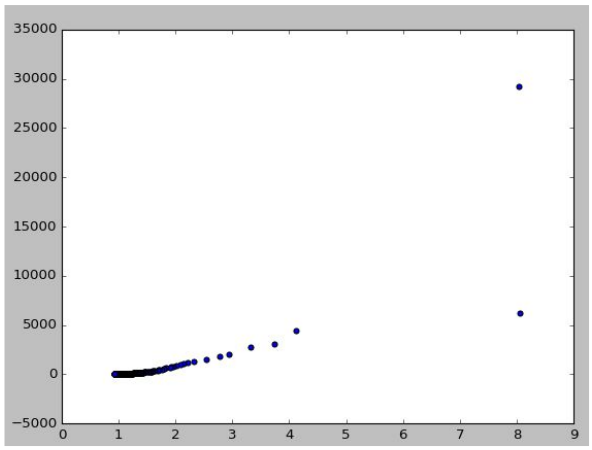
Jezioro



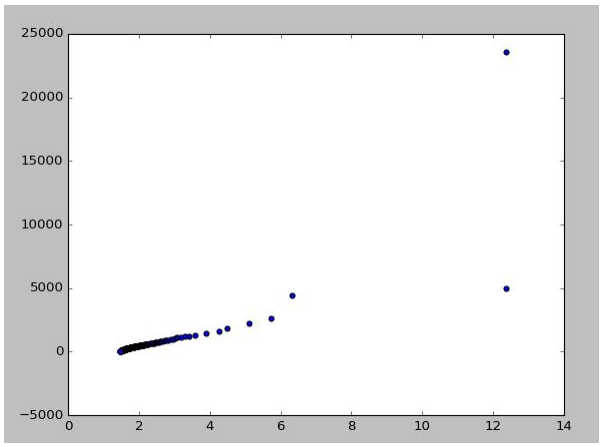
Kot



Kot2



Drzewo



Transformacja falkowa

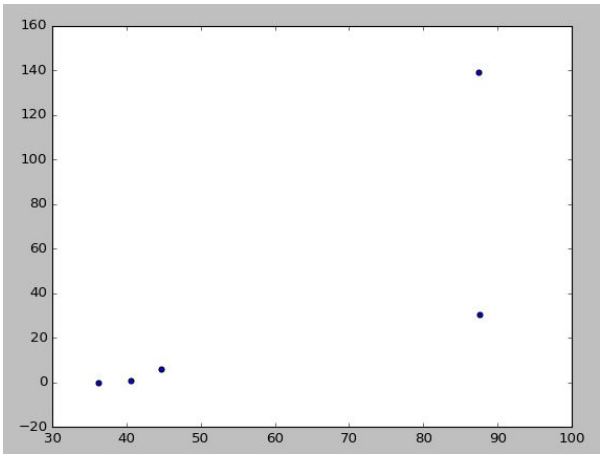
```
cA,cR = pywt.dwt2(imArray,wavename)
cAA,cAR = pywt.dwt2(cA,wavename)
cAAA,cAAR = pywt.dwt2(cAA,wavename)
cAAAA,cAAAR = pywt.dwt2(cAAA,wavename)
cAAAAA,cAAAAR = pywt.dwt2(cAAAA,wavename)

pywt.idwt2((cAAAAA, cAAAAR), wavename,  'smooth')
pywt.idwt2((cAAAA, cAAAR), wavename,  'smooth')
pywt.idwt2((cAAA, cAAR), wavename,  'smooth')
pywt.idwt2((cAA, cAR), wavename,  'smooth')
ipywt.idwt2((cA, cR), wavename,  'smooth')
```

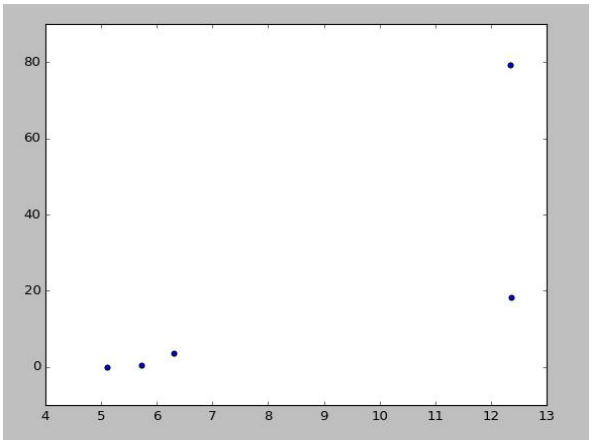
Aby porównać błąd kompresji obrazu oryginalnego i odtworzonego konieczna była zmiana wielkości macierzy opisującej obraz:

```
new_image = cv2.resize(images[i],imArray.shape)
new_image = np.transpose(new_image)
```

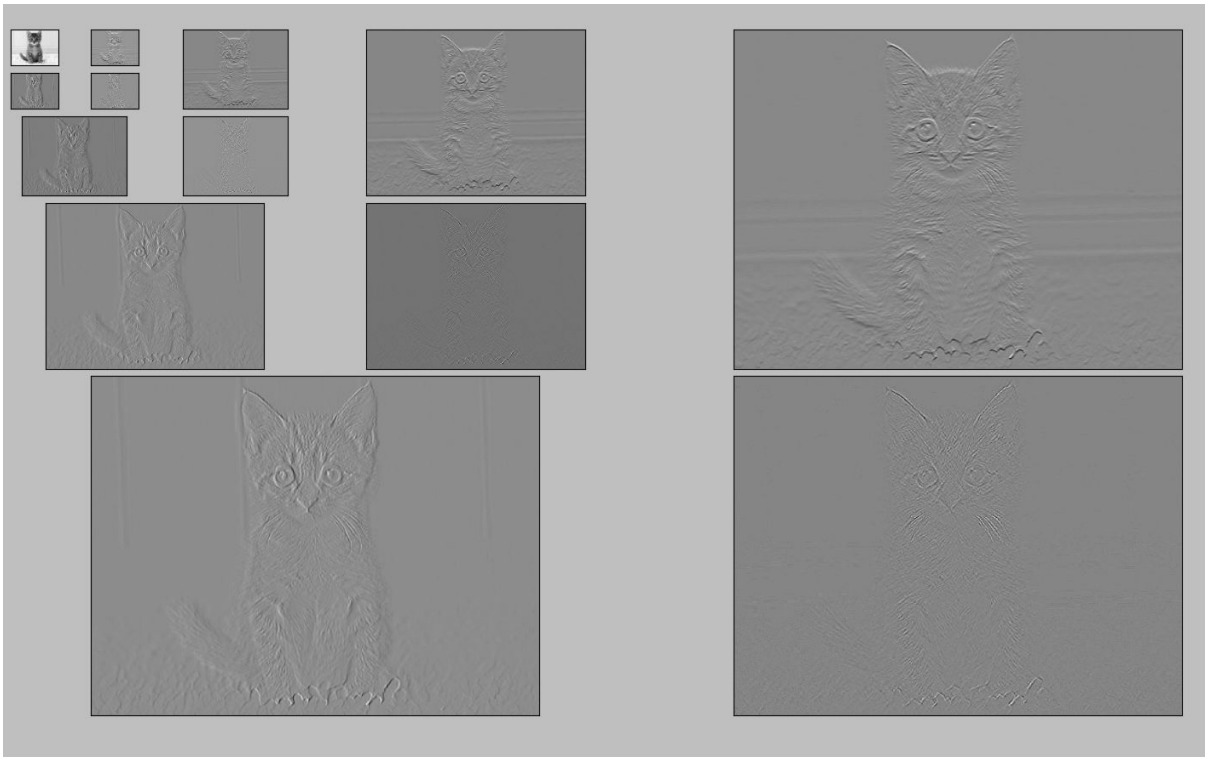
Kot



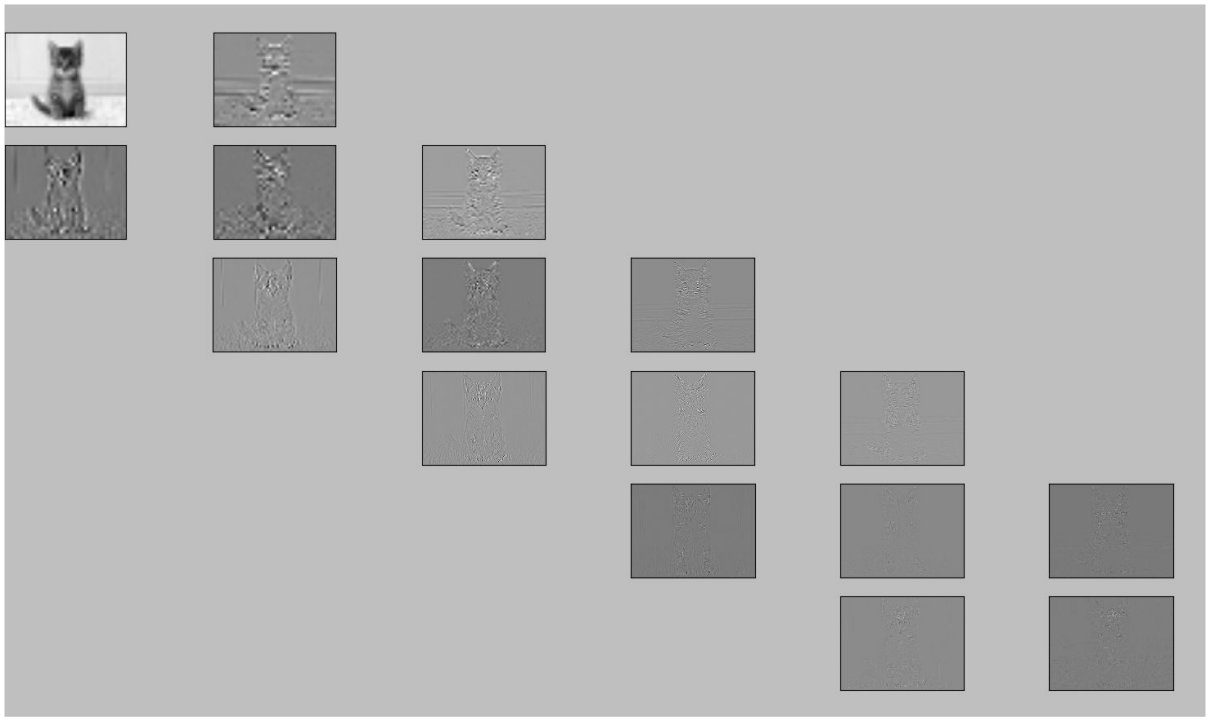
Drzewo



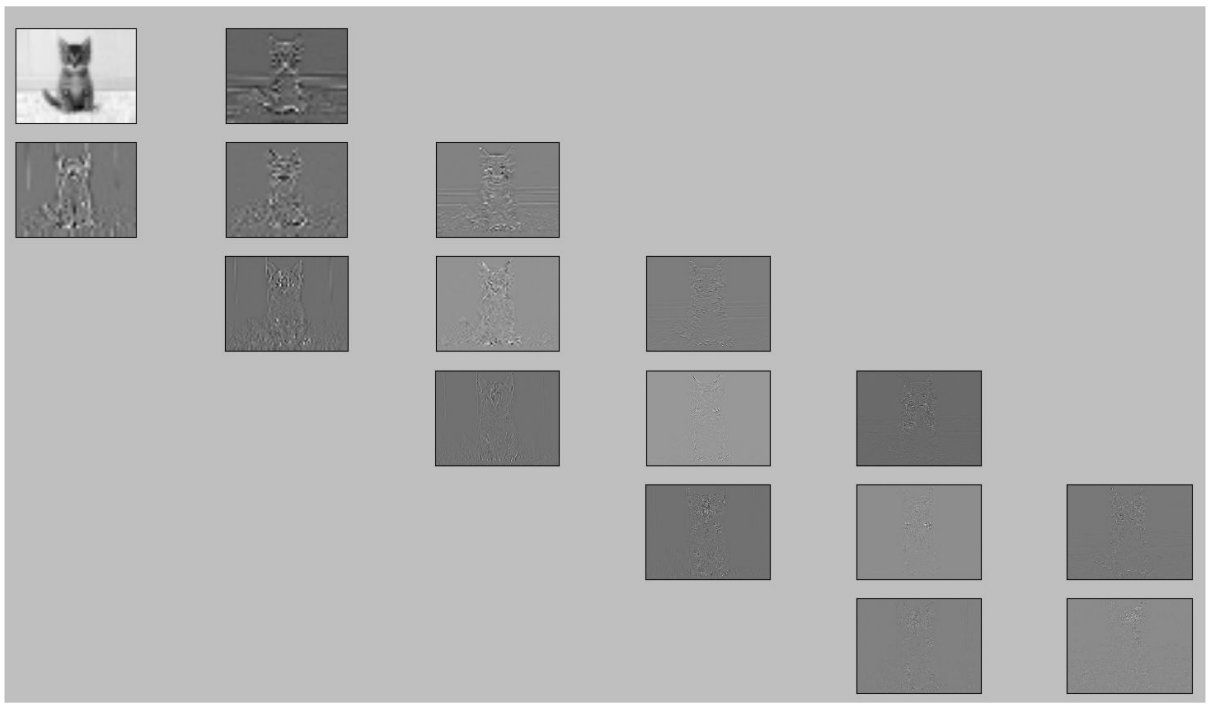
Dekompozycja kota
typ db1



Typ sym2



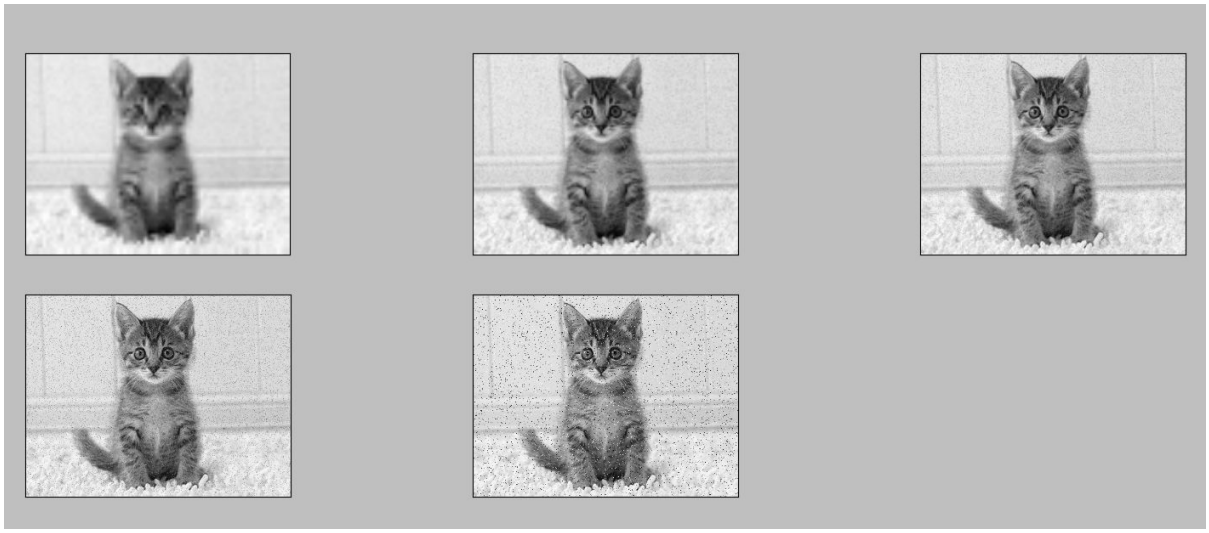
Typ: coif1



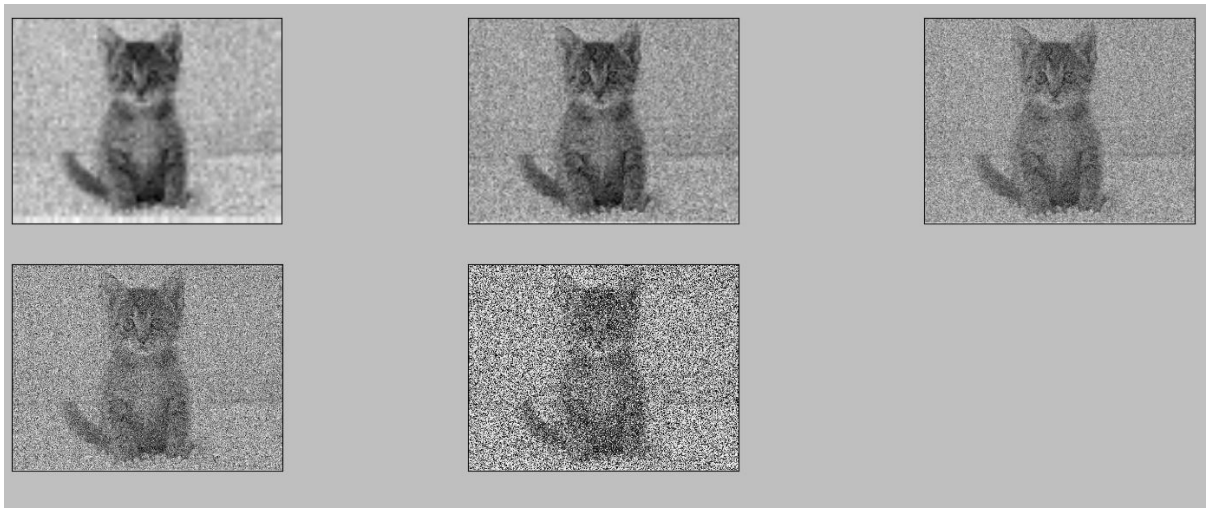
6. Usuwanie szumu

```
skimage.util.random_noise(imArray, mode='s&p', amount =0.8)
```

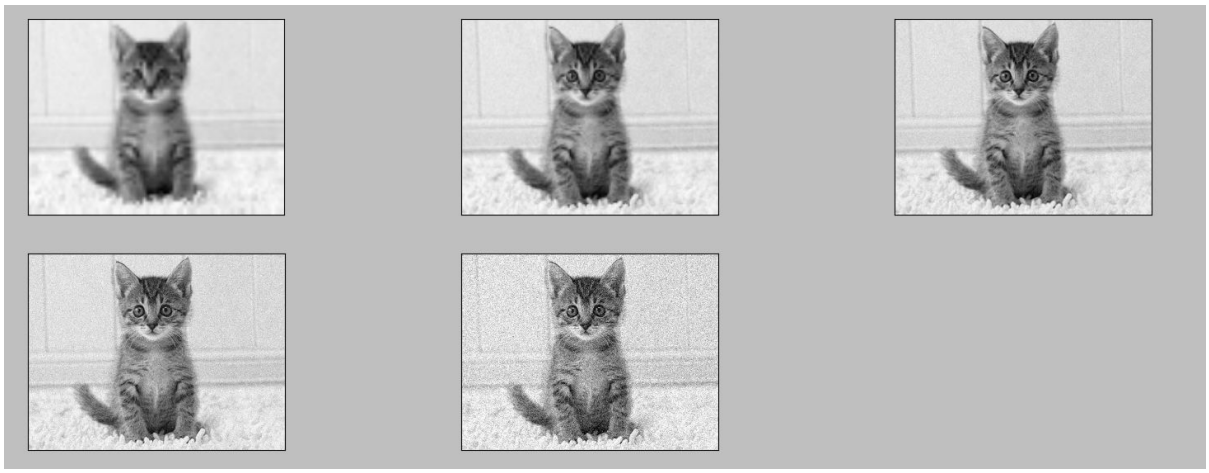
Salt and Pepper: 0.05



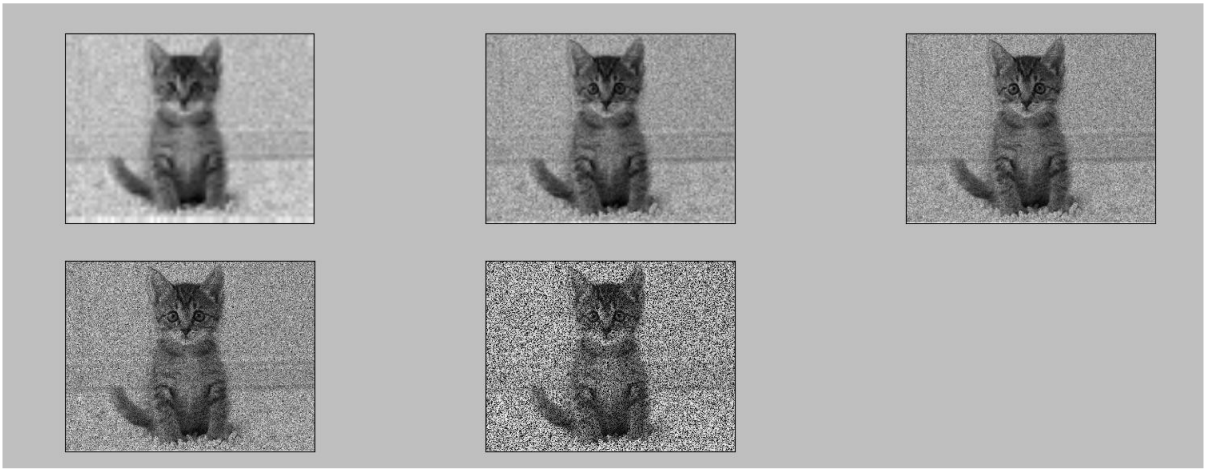
Salt and Pepper 0.8



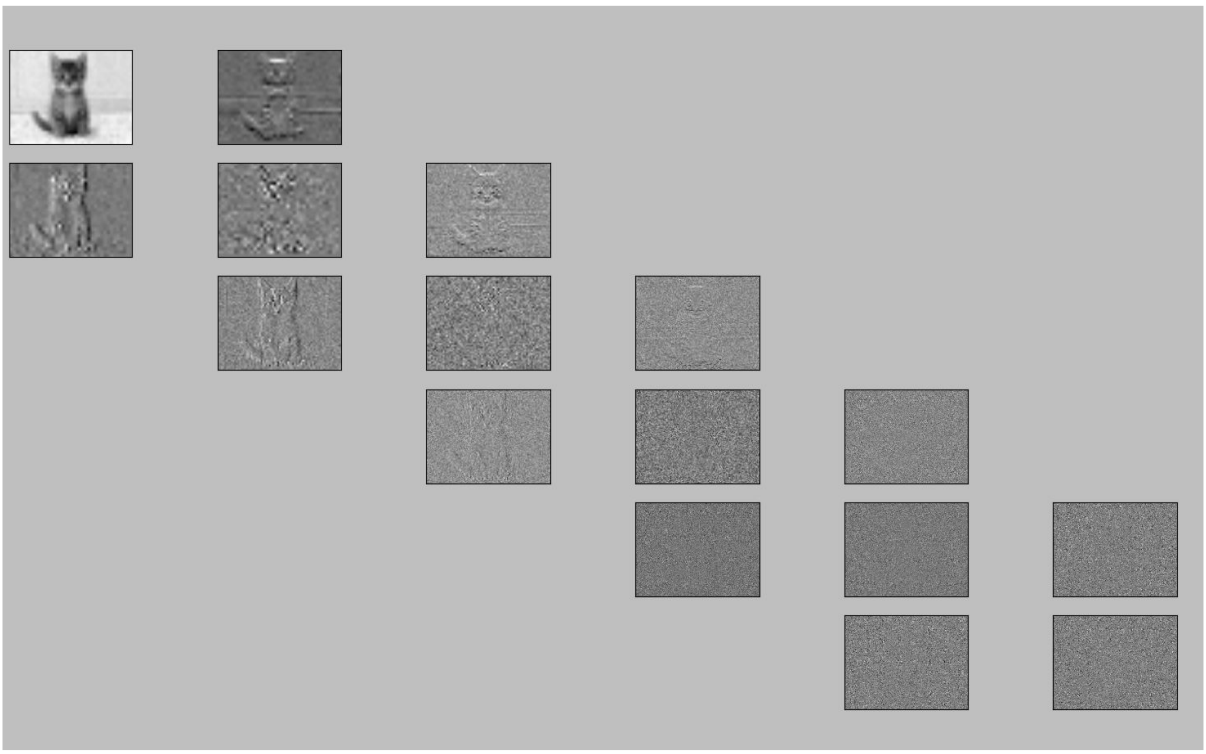
Gaussian: 0.05



Pepper : 0.4



Dekompozycja kota z szumami : salt and pepper 0.2



Jezioro Salt and Pepper: 0.3