Poisson Image Editing

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Sammendrag

1 Innledning

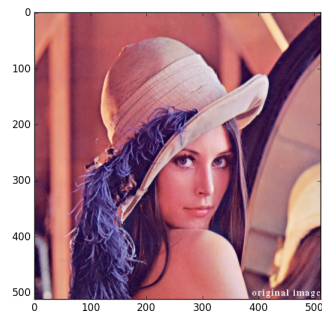# 2 Metode

2.1 Matte

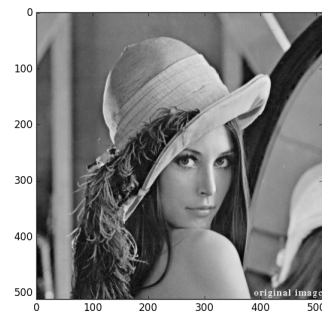## 2.2 Kode

```python
def explicitLaplace(img):    #Laplace transformation
    return (img[:-2, 1:-1] +
            img[2:, 1:-1] +
            img[1:-1, :-2] +
            img[1:-1, 2:] -
            4*img[1:-1, 1:-1])
```
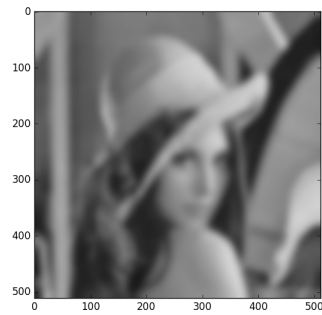
3 Resultater
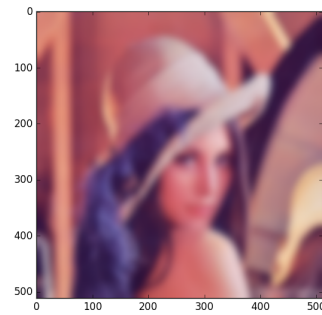

Figur 1: Original

Figur 2: Original greyscale

```
pause = 1e-4
alpha = .25
steps = 100
```

3.1 Blur

```python
for i in range(0, steps):
    ima[1:-1, 1:-1] += alpha * explicitLaplace(ima)
    # Neumann boundary
    ima[:, 0] = ima[:, 1]
    ima[:, -1] = ima[:, -2]
    ima[0, :] = ima[1, :]
    ima[-1, :] = ima[-2 , :]
```
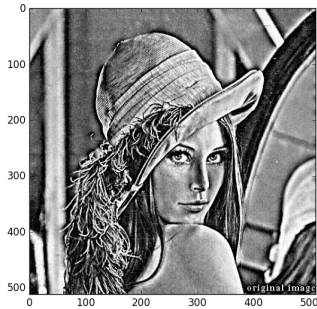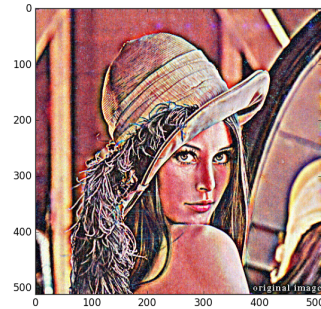

Figur 3: Greyscale blur

Figur 4: Colour blur

3.2 Inpainting

3.3 Kontrastforsterkning

```python
k = 5
lapl0 = explicitLaplace(ima) #Laplace for original image
for i in range(0, steps):    #Increace contrast
    ima[1:-1, 1:-1] += alpha * (explicitLaplace(ima) - k * lapl0)
    #clamps values
    ima[ima>1] = 1
    ima[ima<0] = 0
    #Neuman boundary
    ima[:, 0] = ima[:, 1]
    ima[:, -1] = ima[:, -2]
    ima[0, :] = ima[1, :]
    ima[-1, :] = ima[-2 , :]
```

Figur 5: Greyscale contrast

Figur 6: Colour contrast

3.4 Demosaicing

```python
mosaic = np.zeros(im.shape[:2]) # Alloker plass
mosaic[ ::2, ::2] = im[ ::2, ::2, 0] # R-kanal
mosaic[1::2, ::2] = im[1::2, ::2, 1] # G-kanal
mosaic[ ::2, 1::2] = im[ ::2, 1::2, 1] # G-kanal
mosaic[1::2, 1::2] = im[1::2, 1::2, 2] # B-kanal

demosaic = np.zeros((mosaic.shape[0], mosaic.shape[1], 3)) # Alloker plass
demosaic[ ::2, ::2, 0] = mosaic[ ::2, ::2]    #R
demosaic[1::2, ::2, 1] = mosaic[1::2, ::2]    #G
demosaic[ ::2, 1::2, 1] = mosaic[ ::2, 1::2] #G
demosaic[1::2, 1::2, 2] = mosaic[1::2, 1::2] #B

mask = np.copy(demosaic)
mask[mask > 0] = 1
original = np.copy(demosaic)

for i in range(0, steps):
    blurred = blur(demosaic)
    demosaic = original * mask + (blurred * (1 - mask))

def blur(ima):
    ima[1:-1, 1:-1, 0] += alpha * explicitLaplace(ima[:, :, 0])
    ima[1:-1, 1:-1, 1] += alpha * explicitLaplace(ima[:, :, 1])
    ima[1:-1, 1:-1, 2] += alpha * explicitLaplace(ima[:, :, 2])

    ima[:, 0, :] = ima[:, 1, :]
```
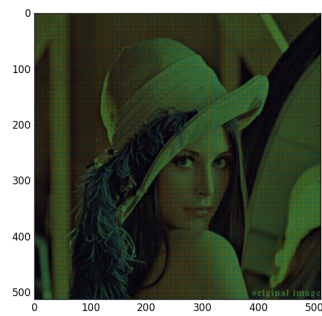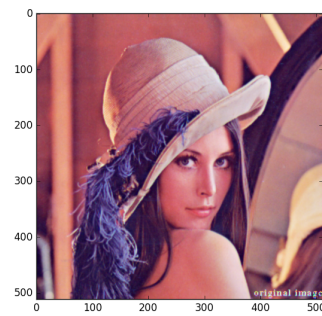
4

```
ima[:, -1, :] = ima[:, -2, :]
ima[0, :, :] = ima[1, :, :]
ima[-1, :, :] = ima[-2 , :, :]
return ima
```
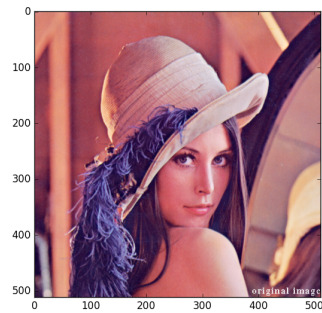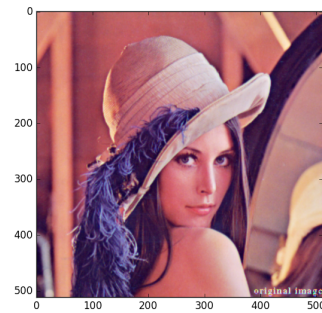

Figur 7: Mosaic

Figur 8: Demosaic

Figur 9: Original

Figur 10: Demosaic

4 Diskusjon

5 Konklusjon