



Computational Photonics/ Computerorientierte Photonik (SoSe 2019)

Exercise 3 (released on May 08th, 2019)

Due on May 17th, 2019 at 8 am!

Lecturer: Prof. Dr. Kurt Busch

Tutor: Dr. Dan-Nha Huynh

1 *Spatial Fourier Transform (2D) - Image Processing

The grayscale picture below is a photograph of the wall in front of the Christian Gerthsen lecture hall at Humboldt University. Download the digital version from the website (or try to take your own picture) and use the Matlab `fft2` function to do a two-dimensional Fourier transform. Visualize the logarithm of the absolute value of the result.

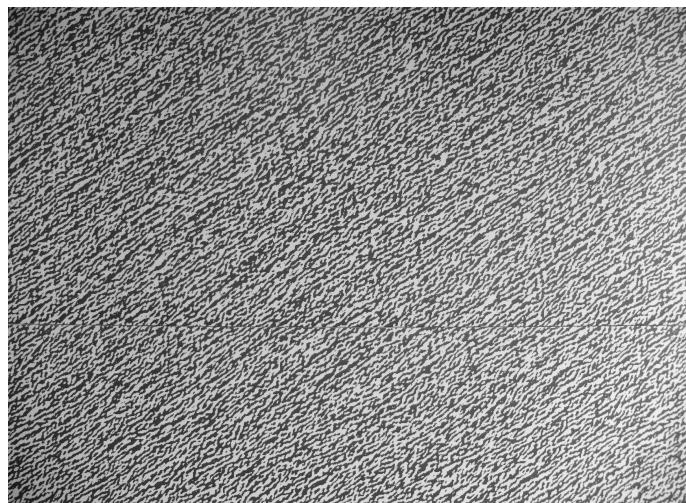


Figure 1: Grayscale version of a photograph of the blue and black pattern in front of the Christian Gerthsen lecture hall at Humboldt University.

Do you recognize the resulting image? Why does it appear twice? How does the result change if you use only part of the original image, e.g. the pixels in the top left quadrant?

Other useful Matlab functions might be `rgb2gray`, `fftshift`, `mat2gray`, `imshow`.

————— Discussion in the exercise on May 17th, 2019 —————

Problems marked with * are voluntary. All others are due on May 17th, 2019 at 8am via e-mail to dhuynh@physik.hu-berlin.de or has to be brought to the exercise class on a flash drive. Analytical solutions are accepted handwritten or in the .pdf format, numerical solution in a digital version.