



26.04.2018

## COMPUTATIONAL PHOTOGRAPHY ASSIGNMENT 1

**Submission deadline for the exercises:** Thursday, 03. May 2018 before 11:59.

**Instructions:** Upload the source code to your solution (**no images please, just the plain code**) in the ILIAS system at:

[ILIAS Computational Photography SoSe2018](#)

### 1.1 Color Reconstruction (10 + 10 = 20 points)

As mentioned in the lecture, one way to sense color is to take photos of a scene with different color filters and reconstruct the original color information by combining those photos afterwards. In this exercise you shall work on the example from the lecture. You are given 3 grayscale images, representing the red, green and blue channel respectively (see Figure 1). For the sake of simplicity and fun of experimenting, a small GUI is provided that allows for comfortable adjustment of the different channel offsets.



Figure 1: Scene photographed with 3 different color filters.

Your task is to implement the underlying functionality

- Add the necessary commands to load the grayscale images in the file `'color_reconstruction.m'`.
- Implement the function `reconstruct(r,g,b)` that accepts the 3 grayscale images `r`, `g` and `b` and returns a rgb-image represented in a 3 dimensional array with dimensions (height  $\times$  width  $\times$  3). The function should be implemented in a Matlab file `'reconstruct.m'`.

**Usage information:** You can switch between the channels either by clicking on the target channel or by using the `r,g,b` or `1,2,3` keys. The offset of a selected layer is then adjustable with the familiar `w,a,s,d` controls or the `cursor arrows`.