Introduction to Numerical Image Processing

Description

The complexity of the calculations in physiological optics often requires the development of customized code. With image and signal processing as a main topic the course covers elementary methods in modelling such as sampling, quantization, the Nyquist frequency and dynamic range.

The module uses MATLAB and the image processing toolbox to focus on the algorithms and methods that pertain to generic methods in image processing such as spatial and intensity transformations, color transformations, thresholding, segmentation, convolution filtering and Fourier analysis. Moreover, methods that apply directly in vision science are addressed such as camera calibrations, measurement of intensity and size, centroiding and more. Examples are given by analysis of images of the cornea and the fundus acquired during during actual experiments.

Learning objectives: The main learning objective is to develop skills for common calculations pertaining to image analysis. The students develop their own scripts in MATLAB during the course.