

Advanced Imaging

Description

Retinal image is determined by the optical parameters of the eye. The course covers a brief introduction to wave optics to arrive to the Fraunhofer approximation. Then, it covers the common conventions for aberration reporting in the human eye and analyses the role of aberrations in image formation and retinal image quality. The role of scatter is addressed using the empirical straylight formulas. Different metrics of image quality used in the literature to characterize the severity of aberrations are defined and computed.

Learning objectives: The main learning objective is to develop skills for common calculations in physiological optics through hands-on experience with coding. In particular, the students given anatomical and optical data of the eye (such as refractive error and wavefront aberrations) will be able to simulate retinal image quality, calculate the optical resolution limit and compute a number of different metrics of image quality such as the optical transfer function of the eye.