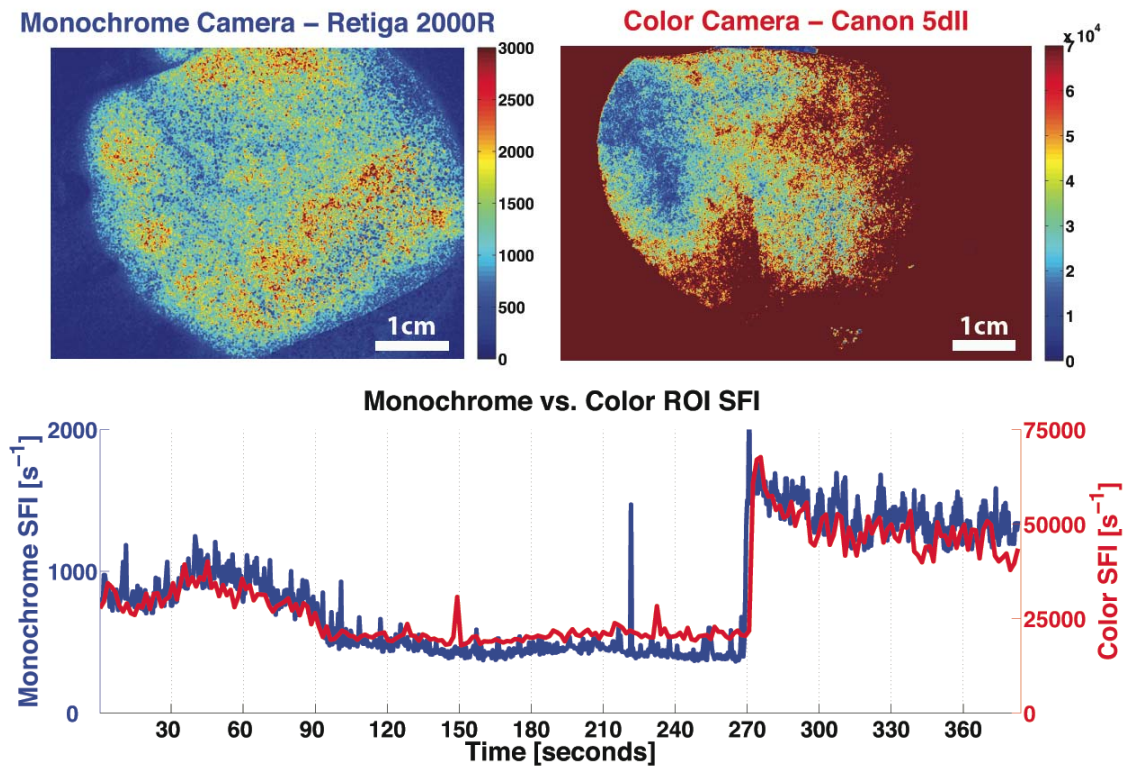


O. Yang, B. Choi, "Laser speckle imaging using a consumer-grade color camera." Optics Letters, Vol. 37, Issue 19, pp. 3957-3959 (2012).



Laser speckle imaging (LSI) is a non-invasive method for determining degree of motion, such as blood flow. However, LSI is naturally confined to laboratory use, partially due to the expensive laboratory-grade monochrome cameras required to capture speckle images. Here we demonstrate the effectiveness of using an off-the-shelf, consumer-grade color camera (Canon 5D Mark II) for LSI. The upper left and right images are both laser speckle blood flow maps (so called speckle flow index [SFI] images) of a human palm that quantify the amount of blood flow. The brighter colors signify more motion (i.e. more blood perfusion). The backgrounds are different colors due to the inherent characteristics of the camera but the data in the center of the palm gives similar information. The bottom graph shows the changes in the average SFI value (indicative of blood flow) over a reactive hyperemia occlusion experiment between the two cameras. The experiment consists of imaging the palm for: a baseline of 1 minute, then a pressure cuff around the arm is inflated to 180 mmHg for approximately 4 minutes, and then 2 minutes after the pressure cuff is immediately released. The graph indicates that the monochrome and color cameras have similar trends in their SFI values over the course of the experiment and suggests that cheaper consumer grade color cameras can possibly be used in replacement of expensive monochrome cameras.