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Spectral reflectance estimation with an optical non contact device for skin assessment
PHOTONICS CONFERENCE ABSTRACT 2015

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Skin chromophores such as melanin, hemoglobin and bilirubin concentrations provide useful information about the health status of skin. In a proof of concept study a low cost hand held imaging device has been developed[1]. The SkImager is based on a multi illumination LED ring and a CMOS sensor (see figure 1). Different absorbance properties of various skin chromophores are being used to study their concentration[1]. The main goal of this research is to explore the quality of this working prototype for spectral estimations. The accuracy of this estimation is determined by the number of spectral channels and the used spectral estimation method. Spectral estimation can be performed with several well known estimation methods like the Wiener estimation or the linear least squares fitting and have been optimized for spectral estimation of skin samples [2]. A suitable spectral estimation method to obtain chromophore concentration maps shall be developed and analyzed. Results obtained shall be compared to the existing chromophore mapping workflows used in the SkImager. First spectral estimation results have been obtained see figure 1. Optimized spectral estimation Methods for this device can be developed and improve the performance and accuracy of chromophor mapping. Advanced mathematical modelling for the optical properties of skin can be used to further increase the accuracy of the estimation.

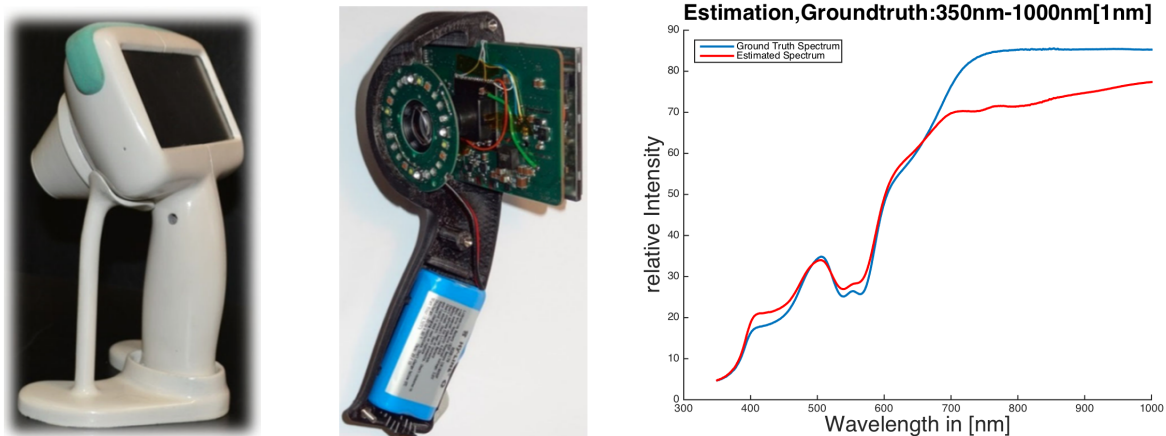


Figure 1: left: SkImager optical non contact Device with LED Ring (5 different Illuminations and CMOS Sensor[1]), right: first estimation result for "light skin" Xrite Colorchecker Patch 2

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