

# PHOTOMETRIC STEREO IMAGING OF SKIN WITH FRAME BASED SPECTRAL IMAGER

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Recent advantages in development of Fabry-Perot interferometer based spectral imagers have made it possible to use spectral information in different application such as skin cancer diagnostics [1]. In traditional spectroscopic studies human skin is a quite well researched area [2]. Skin has layered structure, which is composed mainly two main layers: epidermis and dermis. The optical properties of this structure can be modelled based on Kubelka-Munk theory [3, 4]. This theory is applied to analysis of multispectral imager data in studies such as Jolivot et. al [5] as a parameter fitting problem, where absorption and scattering parameters and skin layer thickness are fitted to match measured diffuse reflectance.

Using well-known techniques for photometric stereo imaging, it is possible to reconstruct surface models from single-viewpoint images by varying the illumination [6]. This is possible also with frame based spectral imagers. Using combined information from diffuse reflectance spectrum and surface models, it is possible to create tomography-like images for possible skin cancer diagnostics. We will present an imaging system and preliminary results estimating human skin structure with photometric stereo and spectral imaging.

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