

Skin Cancer Analytics with Miniaturised Hyperspectral Imager based on Reflectance Model

P. Neittaanmäki¹, I. Pölönen², T. Tuovinen³
N. Neittaanmäki⁴, and M. Grönroos⁵

Abstract: This talk introduces utilisation of novel miniaturised hyperspectral imager to diagnosis of skin cancers. Introduced imaging system delivers spectral reflectance image to the computer. One spectral image can include 10^7 values and with multiple images we can talk quite big data set in this case. Using reflectance model for light transmission in human skin it is possible to extract physical features from the reflectance data, which can be used as features in detecting early phases of skin cancers such as melanoma with modern manifold learning algorithms. These results has been confirmed with clinical trials. In clinical use it is clear that system has to work fast and deliver results reliably.

According World Health Organization (WHO) the incidence of both non-melanoma and melanoma skin cancers has been increasing over the past decades. The cost of treatment is exponentially connected in which phase of the disease is detected. Early detection improves chance of survival. There is large need for non-invasive screening tools such as hyperspectral imaging system introduced in this talk.

^{1,2,3} Faculty of Information Technology
University of Jyväskylä, Finland
pekka.neittaanmaki@jyu.fi

^{4,5} Faculty on Medicine
University of Helsinki, Finland