Portable Device for Non-contact Early Diagnostics of Skin Cancer
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Main components of the proposed portable device and cloud data processing

- Battery (>8 hours of service)
- WiFi module (Access Point)
- IDS camera 1 – 5 MPix
- 3 LEDs diffuse reflection 535 / 640 / 950 nm
- 1 LED fluorescence – 405nm

Remote Matlab servers

IDS camera driver forms video stream

Control unit (Raspberry Pi)

WEB server forms real time video stream

D. Bliznusks, D. Jakovels, I. Saknite, J. Spigulis “Mobile platform for online processing of multimodal skin optical images”
Modules of the portable device

D. Blizņuks, D. Jakovels, I. Sāknite, J. Spigulis "Mobile platform for online processing of multimodal skin optical images"
Spectral characteristics of used light sources
*Melanoma diagnostics parameter – processing of narrow band reflectance images

**Melanoma index:**

\[ p = \text{OD}_{650} + \text{OD}_{950} - \text{OD}_{540} \]

17 melanomas
65 nevi
82 healthy skin

*Analysis of LED excited autofluorescence images

Model: \[ I = a \cdot e\left(-\frac{t}{\tau}\right) + c \]

- \( c \) – background component
- \( \tau \) – bleaching rate

*PhD Aleksejs Lihacovs: doi: 10.1117/1.JBO.20.12.120502
Value range of melanoma diagnostics parameter: analysis of multispectral reflectance images

*PhD Katrina Bolocko & Ilze Lihacova
*Diagnostics parameter maps of malignant melanoma

*PhD Katrina Bolocko & Ilze Lihacova
Autofluorescence images of different skin lesions under 405 nm LED excitation

SK

Pigmented Nevi

BCC
*Auto-fluorescence mean values for different skin lesions (405 nm LED excitation)

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Future work

• Enhancement of image quality of reflectance and fluorescence images
• Image stabilization for processing of AF time series images.
• Development of multimodal approach and validation of diagnostics parameters
• Calibration of proposed method for evaluation of diagnostics threshold.
• More clinical data are required.
Thank you!

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