

# MVG Research Group



## Research area

### Deep neural networks in early detection of melanomas



## Computer-aided dermatopathology

### Research goal:

To improve skin melanoma diagnosis by providing additional means of automatic detection of important diagnostic features in histopathological images.

The research topics include:

- tissue segmentation
- epidermis segmentation
- epidermal morphometry measurement

### Research activity

#### Publications:

- **Dariusz Kucharski, Pawel Kleczek, Joanna Jaworek-Korjakowska**, Grzegorz Dyduch, Marek Gorgon. *Semi-Supervised Nests of Melanocytes Segmentation Method Using Convolutional Autoencoders*. Sensors, 2020, vol. 20, issue 6, 1546, doi: [10.3390/s20061546](https://doi.org/10.3390/s20061546) (HTML)  
[IF5 (2018) = 2.737, Top10]
- **Pawel Kleczek, Joanna Jaworek-Korjakowska**, Marek Gorgon. *A novel method for tissue segmentation in high-resolution H&E-stained histopathological whole-slide images*. Computerized Medical Imaging and Graphics, 2020, vol. 79, 2022, Art. ID 101686, doi: [10.1016/j.compmedimag.2019.101686](https://doi.org/10.1016/j.compmedimag.2019.101686) (HTML)  
[IF5 (2018) = 2.737, Top10]
- **Pawel Kleczek**, Grzegorz Dyduch, Agnieszka Graczyk-Jarzynka, **Joanna Jaworek-Korjakowska**. *A New Approach to Border Irregularity Assessment with Application in Skin Pathology*. Applied Sciences (Basel), 2019, 9(10), 2022, doi: [10.3390/app9102022](https://doi.org/10.3390/app9102022) (Abstract, HTML, PDF)  
[IF5 (2018) = 2.287]
- **Paweł Kleczek**, Martyna Lech, Grzegorz Dyduch, **Joanna Jaworek-Korjakowska**, Ryszard Tadeusiewicz. *Segmentation of black ink and melanin in skin histopathological images*. Proc. SPIE 10581, Medical Imaging 2018: Digital Pathology, 105811A (2018); doi: [10.1117/12.2292859](https://doi.org/10.1117/12.2292859). (Abstract)
- **Paweł Kleczek**, Grzegorz Dyduch, **Joanna Jaworek-Korjakowska**, Ryszard Tadeusiewicz.

*Automated epidermis segmentation in histopathological images of human skin stained with hematoxylin and eosin*. Proc. SPIE 10140, Medical Imaging 2017: Digital Pathology, 101400M (2017). doi: [10.1117/12.2249018](https://doi.org/10.1117/12.2249018). ([Abstract](#), [Poster PDF](#))

- **Paweł Kłeczek**, Sylwia Mól, **Joanna Jaworek-Korjakowska**. *The Accuracy of H&E Stain Unmixing Techniques When Estimating Relative Stain Concentrations*. PCBBE 2017: Advances in Intelligent Systems and Computing, Springer (2017), doi: [10.1007/978-3-319-66905-2\\_7](https://doi.org/10.1007/978-3-319-66905-2_7), pp. 87–97 ([Abstract](#))

#### Conferences:

- [SPIE Medical Imaging 2018](#) (Houston, TX, USA)  
**Paweł Kłeczek**: *Segmentation of black ink and melanin in skin histopathological images*<sup>1)</sup> (poster)
- [20-th Polish Conference on Biocybernetics and Biomedical Engineering](#) (Kraków, Polska)  
**Paweł Kłeczek**: *The accuracy of H&E stain unmixing techniques when estimating relative stain concentrations*<sup>2)</sup> (poster)
- [SPIE Medical Imaging 2017](#) (Orlando, FL, USA)  
**Paweł Kłeczek**: *Automated epidermis segmentation in histopathological images of human skin stained with hematoxylin and eosin*<sup>3)</sup> (poster)

## Anomaly detection with the use of pre-trained CNN architectures



## Detection and analysis of patterns (@asia: muszę dopracować )



## Cell detection - Andrzej...



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