name of the unit:		symbol:
INSTITUTE OF APPLIED COMPUTER SCIENCE Institute of Applied Computer Science of Lodz University of Technology		**I-24** http://iis.p.lodz.pl

head of the unit:	potential promoters:	contact person:
Anna Fabijańska, Ph.D., D.Sc., Assoc. Prof. Lodz University of Technology	Anna Fabijańska, Ph.D., D.Sc., Assoc. Prof. Lodz University of Technology	Anna Fabijańska tel: 42-631-27-50 anna.fabijańska@p.lodz.pl

scope of activities:

Computer vision, digital image analysis and machine learning (including deep neural networks and graph neural networks) in selected problems in the field of medicine, industry and earth & environmental sciences.
Development of supervised and unsupervised methods of digital image segmentation.

graphic material

Tree-rings and resin duct detection in wood core images.

present activities:

1. Development of methods for computer aided diagnosis in ophthalmology.
2. Development of convolutional neural network models for computed aided dendrochronoligical and varve-based analysis (wood species recognition, tree-rings detection, resin ducts detection, automation of dendrochronological measurements, glacial varve (laminae) detection).
3. Weak supervision in convolutional neural network based image segmentation.
4. Automatic colorization of vintage movies using artificial intelligence methods.

Automatic colorization of vintage movies.

Segmentation of corneal endothelium images

Future activities:

- Carry on the present activities listed above.

publications/patents/awards/grants:

1. Fabijańska A., Banasiak R.: Graph Convolutional Networks for Enhanced Resolution 3D Electrical Capacitance Tomography Image Reconstruction, Applied Soft Computing, vol. 110, 2021, 107608.
2. Czepita M., Fabijańska A.: Image processing pipeline for the detection of blood flow through retinal vessels with subpixel accuracy in fundus images, Computer Methods and Programs in Biomedicine, vol. 208, 2021, 106240.

3. Kucharski A., Fabijańska A.: CNN-Watershed: A Watershed Transform with Predicted Markers for Corneal Endothelium Image Segmentation, Biomedical Signal Processing and Control, vol. 68C, 2021, 102805.
4. Affane A., Kucharski A., Chapuis P., Freydier S., Lebre M.A., Vacavant A., Fabijańska A.: Segmentation of liver anatomy by combining 3-D U-Net approaches, Applied Sciences, vol. 11, no. 11, 2021, str. 4895.
5. Fabijańska A., Danek M.: Wood species automatic identification from wood core images with a residual convolutional neural network, Computers and Electronics in Agriculture, vol. 181C, 2021, str. 105941.
6. Fabijańska A., Feder A., Rigde J.: DeepVarveNet: Automatic detection of glacial varves with deep neural networks, Computers & Geosciences, vol. 144, 2020, str. 104584.
7. Fabijańska A., Grabowski S.: Viral Genome Deep Classifier, IEEE Access, vol. 7, 2019, str. 81297-81307.
8. Chybicki M., Kozakiewicz W., Sielski D., Fabijańska A.: Deep cartoon colorizer: An automatic approach for colorization of vintage cartoons, Engineering Applications of Artificial Intelligence, vol. 81C, 2019, str. 37-46.

Keywords:
computer vision; image analysis; machine learning; neural networks; convolutional neural networks; image segmentation

List of internship proposal in this research team: