EUROPEAN UNION
European Structural and Investment Funds
Operational Programme Research,
Development and Education

MINISTRY OF EDUCATION,
YOUTH AND SPORTS

Zdroj: https://predmety.fbmi.cvut.cz/cs/doktorske-bme

Name of study subject: **Digital processing of 2D biosignals**

Brief annotation of the subject:

The main topics of the course are techniques of 2D biosignals processing; discrete 2D transformations; linear filtration; reconstruction of images from projection; analysis of 2D signals (distortion and noise identification, wave decomposition, edge detection, segmentation, texture analysis); Special applications of 2D biosignals processing in medicine (ultrasound, MRI, CT, microscopic images, etc.).

Brief Syllabus of Lectures:

1. Fourier transform, Hadamard transform.
2. Discrete cosine transform.
3. Wave transformation.
4. Basic geometric operations, spatial deformation, perspective transformation.
5. Mathematical model of the camera.
6. Morphological operations (binary and grayscale images).
7. Measurement of the morphological characteristics of the objects in the image.
8. Segmentation and thresholding (1).
9. Segmentation and thresholding (2).
10. Unitary transformation algorithms (FT, cosine, sine, Hadamard, Haar, Karhunen-Loeve).
11. Image restoration techniques (1).
12. Image restoration techniques (2).
13. Inverse filtration.
14. Wiener's filtration, pseudoinversion.